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GOVERNMENT OF INDIA
MINISTRY OF AGRICULTURE
(Department of Agriculture & Cooperation)

REPORT ON FOREST RESOURCES OF NORTH ANDAMAN

FOREST SURVEY OF INDIA
DEHRA DUN
1981

Contents

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(2) Map showing forest and selected grid points

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(4) Histogram showing per hectare volume and total volume of residual and small wood.

(5) Map showing roads, creeks and jotties.

INTRODUCTION

The Andaman and Nicobar Islands consist of 348 large and small Islands and islets, located at a distance of 1,255 km. and 1,191km. from Calcutta and Madras respectively. The main Islands are arranged in a chain running almost parallel to North-South direction towards south east of India. Geographically these Islands are distinguished into two main groups namely "The Andaman group" and "The Nicobar group". The Andaman group of Islands are situated in the Bay of Bengal and lie in between the latitudes of 13°41' and 10°30' North and the the longitudes of 92°11' and 93°7' East.

The present project area encompasses North Andaman forests and a part of adjoining Middle Andaman Forests.

On a request of the Andaman Forest Department to ascertain the resources potential of the present project area, the Pre-investment Survey Of Forest Resources, Eastern Zone carried out the survey during the year 1978-79. The present study confines to the project area which has not so far been fully exploited and does not suffer from encumberances of local demand. The report sets out details of methodology and investigations followed in order to ascertain the resources potential of the area.

BACKGROUND.

The Andaman Forest was explored in the year 1939 by Dr.Helter, A Russian Scientist. Forest Department was established by Mr.Ferrar in the year 1883 and a regular forest work was initially started by him. Felling and extraction were very irregular and confined to accessible areas only to make up the limited local demand of timber for house construction and other domestic uses. Few species of timber favoured for extraction were - Pterocarpus dalbergioides(Padauk), Dipterocarpus spp.(Gurjan), Terminalia bialata(Silvery grey) and Albizzia lebbek(Koko). The species were extracted due to their high demand in the local as well as foreign market, and also for their easy availability in the forests. There was no regular Working Plan for these Islands during the period. A Government Saw Mill was established at Chatham, South Andaman in the year 1883 and gradually Match wood, Plywood and other wood based industries were established during the period 1929 to 1959 by various Private Agencies.

Till World War II extraction was limited to very few species and was mainly carried out by M/S P.C.Ray & Co. who took the lease of North Andaman area in 1951 on a long term basis. However, the Agency stopped working during 1954 and as a result the forestry operation remained standstill for a considerable period.

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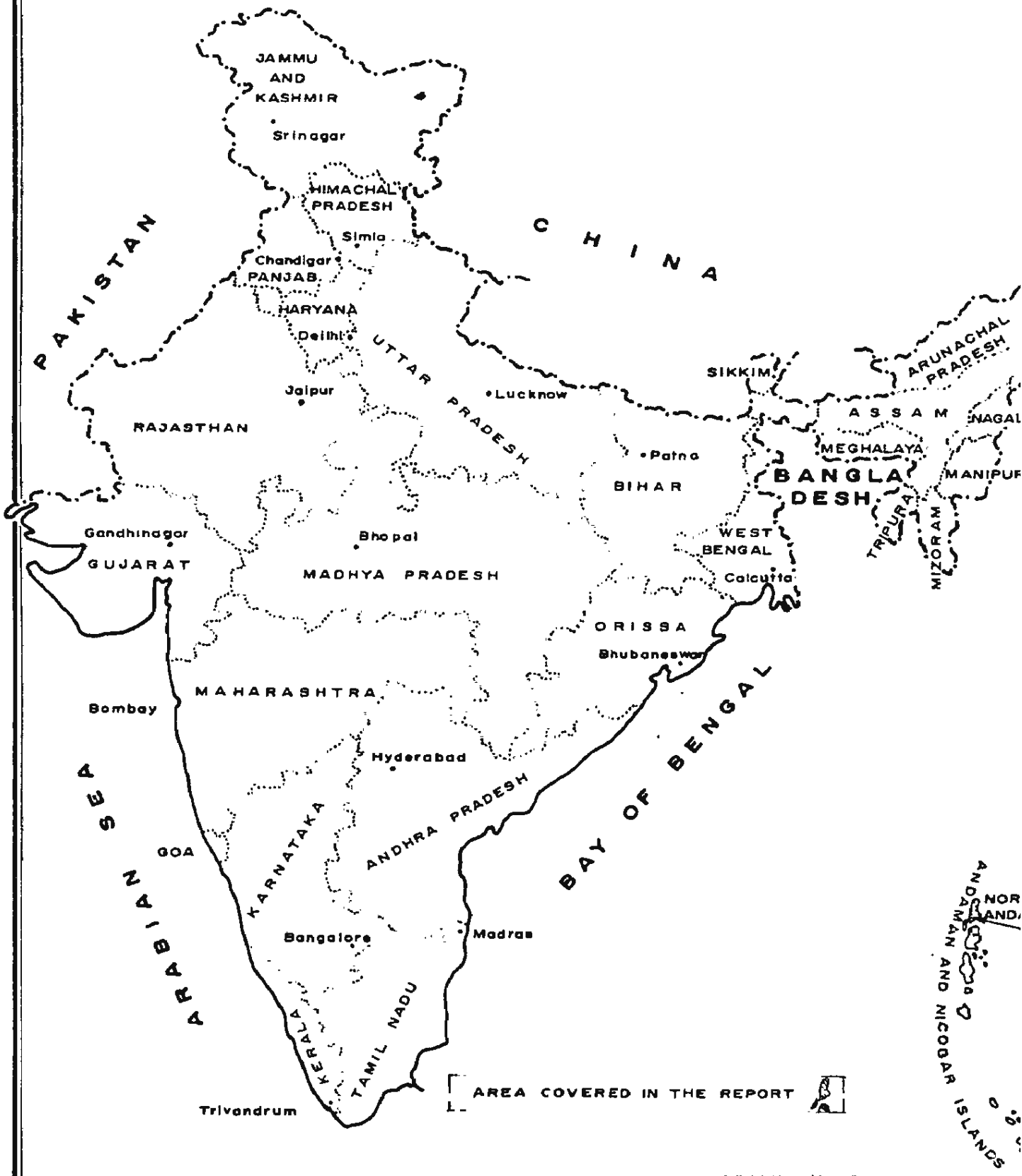
PRE-INVESTMENT SURVEY OF FOREST RESOURCES EASTERN ZONE.

MAP OF INDIA

SHOWING PROJECT AREA NORTH ANDAMAN

SCALE — 1 : 15,000,000



DRAWN BY — SUMAN BHATTACHA

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CHAPTER - I

GENERAL

1.1 Name of the area :

The project is mainly confined to the workable Islands of the North Andaman Forest Division. The total geographical area surveyed is 2338.98 sq.km. The area is irregular in shape and segmented by innumerable large and small bays.

1.2 Location :

The project area is on the North of the main group of Andaman Islands and is about 100 nautical miles away from the Capital Port Blair. The Northern boundary of the project area is bounded by the Bay of Bengal (beyond the "Land fall" Island), while the south is mainly bounded by the ridge dividing the catchment of Tugapur boilu and Karang Nala and proceeding further along the trunk road near Pathar Tikkri and ultimately dividing the catchment of Karmatang and Badam Nala. Andaman sea is located in the east and Bay of Bengal on the west. The eastern most and the western most Islands are Smith Island/Table Island and "Interview" Island respectively.

1.3 Factors of locality :

1.3.1 Terrain :

The terrain in the project area varies from flat to undulating forest areas except the "Saddle Peak" in the North Andaman, which is comparatively high and hilly. The highest peak in the Saddle Hill is about 732 m. Since Andaman has been described as a part of the sunken Arakan Hills, the hills in many cases on the eastern side have emerged directly from the sea leaving no space as beach and the rocky surface is visible at the point where the hills have merged with the sea.

1.3.2 Soil :

The soil deposition is low in depth in the hilly regions in comparison to valleys where depth is more. Due to heavy rain fall, soil erosion and exposed rock surface is very common at many places; it is due to excessive felling in concentrated localities in heavy rain fall areas. Cyclones occur occasionally and affect the forest crop due to the poor root system.

1.3.3 Population :

Andamanese are the original people of these Islands. At present they are very few in numbers and are treated as a friendly tribe. Aboriginal tribes except the Jarwas are non-existent in the project area. The Jarwas are hostile by nature and occur in splinter groups in few places of the project area. Population of Jarwas could not so far been exactly ascertained. They are away from civilised world and live on sea fish, fruits and roots of different kinds of trees.

Present inhabitants of North Andaman are primarily displaced persons from Bangladesh, repatriates from Burma and Ceylon, ex-servicemen and some persons who escaped long back from the cellular jail. They have settled at Diglipur, Kalighat, Parangara, Kishorinagar, Mohanpur and Ramnagar areas in North Andaman and in Tugapur, Rampur, Webi, Karamtang 2 and 3 in Middle Andaman. The existing labour force and the Government officials also form a bulk of the total population in the project area.

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1.4. Physical feature:

The terrain of the Islands of the project area is irregular and more or less hilly or undulating and at times flat in the valleys though narrow in width. The hills following the general direction of the Islands lie nearly North and South. Several spurs and ridges run off the main ranges in all directions and cause a very confused topography. Flat lands are comparatively few and mainly confined to the stream banks forming narrow valley. Undulating ground have been broken up by spurs and ridges and intersected by seasonal and perennial streams.

The slope varies from moderate to steep - major area (about 84%) comes under 1° to 20° slope and about 13% is under 21° to 30° slope while 2% area comes under 31° to 45° slope. The general aspect of slope is towards east and west. North Andaman Division is comparatively much more hilly than Middle and South Andaman Divisions. Average height of the hill ranges vary from 150 m. to 200 m. M.S.L. In general western side of the hill ranges are generally higher than that of the eastern side. All hills of North Andaman are covered with a luxuriant growth of tropical rain forest. No barren hill or Island is observed in the project area.

1.5. Geology, rock and soil :

The geology of Andaman islands is not established. They are described to be the southern continuation of Arakan Yoma tectonic unit. Geological formation of the project area is mainly of thick grained sand, stone, shales, siltstone and lime-stones with intrusion of basic and ultra basic igneous rocks. The underlying rocks are essentially sandstone. Serpentine rocks are found in the higher altitude and the Islands are eocenic sediments of sand stone growing into conglomerates. Andamans are a part of old Gondwana land mass and are of very ancient origin.

The geological formation of the project area is responsible for different types of forests which again in turn accounts for the floristic composition of the entire Islands. The soil is mainly acidic in nature. Soil texture is medium on the surface and heavy in the deeper layer. Humus and organic matter deposition in the soil is very poor. Though the project area is under the tropical wet zone, scarcity of sweet water is a constant problem due to the soil texture and humus content. Preservation of rain water in the rainy season is not possible and that causes erosion and due to lack of conservation of soil moisture in the dry season the soil becomes devoid of moisture.

1.6. Climate:

The project area lies in the tropical wet zone and hence the climate is warm and humid. Humidity remains high throughout the year. Seasons here can be broadly characterised into two (summer and the rainy). The extreme summer is practically unknown. Maximum temperature varies between 26°c. to 31° c. and the minimum varies between 19° c. to 23° c. throughout the year. Comparatively hot season occurs between March and May; warm season between June and October and mild seasons between November and February. Humidity is high and ranges upto 80%.

Average annual rainfall during last four years have been recorded at Mayabandar as 3239.74 mm., which is about 11% more than that of Port Blair. Rainfall is comperativelly high in the project area and the area gets maximum rainfall during June to October due to south western monsoon.

Monthwise rainfall data is given as under :-

RAINFALL RECORDED IN TUGAPUR (MAYABANDAR) DURING 1974 to 1978.

MONTHS	1974		1975		1976		1977		1978	
	No. of rainy days	Rainfall in mm.	No. of rainy days	Rainfall in mm.	No. of rainy days	Rainfall in mm.	No. of rainy days	Rainfall in mm.	No. of rainy days	Rainfall in mm.
JANUARY	4	47.00	9	462.20	1	5.80	6	319.60	2	45.00
FEBRUARY	Nil	-	Nil	-	2	21.20	Nil	-	1	35.20
MARCH	2	21.20	Nil	-	Nil	-	Nil	-	1	10.20
APRIL	9	153.20	3	12.00	4	212.00	Nil	-	4	67.60
MAY	16	416.40	16	419.40	21	642.40	4	27.00	16	393.00
JUNE	27	498.80	28	1076.40	17	456.40	22	322.80	15	346.80
JULY	21	392.80	20	345.00	24	627.20	27	396.00	27	720.40
AUGUST	25	733.80	24	440.80	25	452.00	23	561.20	21	416.40
SEPTEMBER	18	238.80	24	395.40	17	468.00	24	608.80	22	439.80
OCTOBER	19	428.40	25	527.60	15	179.40	15	292.40	17	279.30
NOVEMBER	16	253.40	18	222.20	16	152.80	3	77.00	4	87.50
DECEMBER	3	8.20	5	46.40	5	345.60	2	25.80	4	24.60
TOTAL	160	3192.00	172	3947.40	147	3562.80	126	2630.60	134	2865.80

$$\text{Average} = \frac{161298.60}{5} = 3239.74 \text{ mm.}$$

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RAINFALL RECORDED AT VARIOUS STATIONS IN ANDAMAN & NICOBAR ISLANDS (in m.m.).

Station	1974	1975	1976	1977	1978 *
Port Blair	3093.7	2755.4	3498.7	2331.8	157.2
Long Island	2665.4	3303.4	3637.6	3027.1	204.0
Mayabunder	3084.2	3401.2	3031.4	2432.0	70.7
Hutbay	3022.1	2935.4	3263.8	2279.3	164.4
Nancowrie	2893.6	2723.5	2340.1	2162.0	122.3
Car Nicobar	3827.5	3362.4	2966.9	2983.5	165.6
Kondul	3146.0	3300.0	3430.3	2545.4	170.8

* Upto March 1978.

TEMPERATURE AND HUMIDITY RECORDED IN ANDAMAN ISLANDS (TAKING ALL PLACES OF RECORDS).

Year	Mean Max. temperature in °C.	Mean Min. temperature in °C.	Average temperature in °C.	Mean relative humidity in % At 0830 hrs.	At 17.30 hrs.
1970	30.7	23.2	26.9	78	82
1971	30.3	22.5	26.4	76	80
1972	29.9	21.9	25.9	77	80
1973	29.7	23.1	26.4	78	80
1974	29.4	22.3	25.8	77	80
1975	29.0	20.0	25.0	77	80

1.7. The people and their socio-economic conditions :

In addition to the local tribals there is a mixture of Tamilians, Bengalees, Keralites, Kannada, Andherite etc. from the mainland. The total population at Diglipur Tahsils is 9470 and at Mayabunder Tahsils is 8443- (mainly dominated by displaced Bengalees of East Bengal (1971 - Census).

The people and their socio-economic conditions in the project area reflect a dismal picture. The aboriginal tribe 'The Jarwas' are suspicious of the modern world and live in seclusion along the western - coastal region of the Middle Andaman. Any attempt on the part of the Government to rehabilitate this primitive tribal population of the area has been met with hostility. Anthropological Survey of India failed in their attempt to collect information on their socio-economic status.

Agriculture forms the primary source of occupation. Besides a large section is engaged in Government service, while a section of the population is dependent on the forest resources. With the increase in population the demand on forest produce shows an increasing trend. Remoteness and difficulties of transport and communication have stood on the way of economic development of the areas.

Life in the island is very lonely and isolated. Scope of entertainment and recreation is very limited and confined amongst themselves only. Games and sports are very much limited and confined amongst the school students.

The socio-economic condition of the people is below the expected level due to remoteness and communication difficulties of the area.

1.8. Infrastructure :

The infrastructure of the area is very poor. Lack of communication, transportation and remoteness stand on the way of development of the pro--ject area. Water transport is the main mode of transportation in these islands but the services are very irregular and uncertain. Both water and land transport are still in a primitive stage due to lack of motor water crafts, landing jetty, motor vehicles and unsatisfactory road development. Construction of road is very costly since most of the materials like cement, iron bars, tar etc. are to be brought from main land. It was proposed to construct a G.A.T. road through South, Middle and North Andaman. The proposed length of the road is 343 km., of which 236 km. have already been completed. The hostile activity of the Jarwas has been a serious set back in this regard. In the localities like Diglipur and Mayabunder feeder roads or link roads have been developed to a limited extent. Feeder road infrastructure in the area is insufficient and still large areas are inaccessible for forest operation.

Very recently, the Andaman and Nicobar Forest Plantation and Development Corporation Ltd. have taken up intensive work in the project area for its infrastructural development. T he present G.A.T. road is 51 km. in the project area having a link road or feeder road of about 112.8 km.

T he approximate cost of construction of new roads and maintenance of old roads in the project area are as under.

Sl.No.	Type of roads	Cost of construction	Cost of maintenance
1.	G.A.T. Road	Rs. 5 to 8 lakhs/km.	Rs. 2.5 lakhs/km.
2.	Link road or feeder road	Rs. 3 lakhs/km.	Rs. 1.5 lakh/km.
3.	Forest service roads	Rs. 3.5 lakhs/km.	Rs. 3,000/km.
4.	Forest feeder roads	Rs. 1.25 lakhs/km.	Rs. 2,000/km.

The cost of new roads are more or less same in North, Middle and South Andamans. Only cost of Bridges and Culverts vary from place to place as per the terrain condition. Most of the culverts are made of wood and in rare cases these are made of R.C.C. Prevailing rates of bridges and culverts are as follows :-

COST OF BRIDGES AND CULVERTS

1.	30 m. x 6.8 m. R.C.C. Bridge	=	Rs. 8 lakhs
2.	3.5 m. single hume pipe	=	Rs. 10,000
3.	8.5 m. double hume pipe	=	Rs. 20,000
4.	30 m. x 6.8 m. wooden bridge	=	Rs. 2 lakhs.

Length of roads and connecting links in the project area are as follows :-

	PLACES	ROADS	
		Tar roads.	Kachha roads
1.	Diglipur to Durgapur village (via Aerial Bay).	15 km.	3 km.
2.	Diglipur to Kalighat	7 km.	11 km.
3.	Diglipur to Laxmipur	7 km.	2 km.
4.	Mayabunder to Rest Camp (via Tugapur)	25 km.	-
5.	Mayabunder to Webi Village	11 km.	-
6.	Rampur to Karmatang Village	1.5 km.	5 km.
7.	Tugapur to Austin Bay	3 km.	-

The above link roads of feeder roads were all constructed by the Andaman P.W.D. Forest Department has not constructed any permanent road in the project area except seasonal extractional paths for movement and transportation of timbers from the coupe areas. These roads are very limited in numbers and their lengths are upto 5 km. only. These extraction paths are not normally used on completion of the coupe work and ultimately merge with the surroundings.

1.9 Area statement of North Andaman Project (Area in km^2)

In absence of aerial photointerpretation maps, the area estimate was based on the forest vegetation maps of the State Forest Department. The final area estimate arrived at is as under :-

	Nomenclature	North Andaman Forest Division (km^2).
1.	Geographical area	2338.92
2.	Rehabilitation and other area	183.07
3.	Forest area	2155.85
	(a) Area of plantation, natural regeneration, Jarwa Reserve, Mangrove forest and protection working circle.	570.63 (Mangrove area 292.54 km^2)
	(b) Net area of high forest	1585.22

1.10 Maps and Aerial Photographs :

Survey of India topo-sheets were used for the ground inventory work. Sample plots were numbered and marked on the maps at the initial stage. Finally these plots were located on the ground with the help of map and plots were laid out. The maps used were of 1:25,000 scale and the year of printing was 1972 (most current maps prepared by the Aerial Photographs).

Following map sheets were used in the project area.for survey work and they were altogether 39 in numbers:-

Toposheet No.	Scale	Toposheet No.	Scale
86 C/14/5	1:25,000	86 C/16/5	1:25,000
86/G/2/2	"	86 G/4/2	"
86 C/14/6	"	86 C/16/3	"
86 G/2/3	"	86 C/16/6	"
86 C/15/1	"	86 G/4/3	"
86 C/15/4	"	86 D/9/4	"
86 G/3/1	"	86 D/13/1	"
86 C/15/2	"	86 D/13/4	"
86 C/15/5	"	86 G/5/1	"
86 G/3/2	"	86 D/9/5	"
86 C/15/3	"	86 D/13/2	"
86 C/15/6	"	86 D/13/5	"
86 G/3/3	"	86 D/9/6	"
86 C/16/1	"	86 D/13/3	"
86 C/16/4	"	86 D/13/6	"
86 G/4/1	"	86 D/10/4	"
86 C/16/2	"	86 D/14/1	"
86 D/14/4	"	86 D/10/5	"
86 D/14/2	"	86 D/10/6	"
86 D/14/3	"		

1.10.1. Aerial photographic coverage :

The following aerial photographs cover the project area under strip No. 764 A. and they were consulted in the field for locating the grids and plots :-

Sl. No.	Run No.	Photo No.	Scale	Sl. No.	Run No.	Photo No.	Scale
1	1	1 to 5	1: 25,000	2	2	1 to 15	1: 12,500
3	3	1 to 5	1: 12,500	4	5	1 to 27	"
5	6	1 to 3	"	6	5	1 to 6	1: 25,000
7	7	1 to 19	"	8	9	1 to 21	1: 12,500
9	15	1 to 15	1: 25,000	10	10	1 to 6	1: 25,000
11	17	1 to 23	"	12	18	1 to 14	"
13	20	1 to 16	"	14	21	1 to 30	"
15	22	1 to 10	"	16	24	1 to 9	"
17	26	1 to 42	"	18	23	1 to 28	"
19	29	1 to 2	"	20	30	1 to 18, 22 & 23.	"
21	31	1 to 8	"	22	32	1 to 8	"
23	36	10 to 24	"	24	37	1 to 5	"
25	38	1 to 11	"	26	42	1 to 21	"
27	43	6 to 17	"	28	44	1 to 4	"
29	48	1 to 15	"	30	49	1 to 22	"
31	52	1 to 9	"	32	55	4 to 7	"

(for detailed operational procedure see Appendix - I).

CHAPTER - II.

THE RESOURCES BASE

2.1. Vegetation :

The Andaman Islands are covered with thick vegetation of various types of valuable timber species. The luxuriant growth of the trees make the forests of these islands, one of the most rich and beautiful forest of t the continent. T he floristic composition of the entire vegetative cover comprises of many known and unknown species, the utilization of all of them is not yet known.

About 90% of the total geographical area of the project i.e. North Andaman islands is under forest cover. The rest was clearfelled for settlement of displaced persons and others. The forests in these Islands are of wet tropical type. The different sub-types are not clearly distinguishable as they are intermingled with each other. In some cases the change in forest type is very gradual while sometimes it is more abrupt. Noteworthy is the change from mangrove forest (tidal swamp forest) to littoral forest and from littoral forest to evergreen or deciduous forest. It is generally observed in the area that deciduous forest follows the littoral forest. Such changes are abrupt.

The forest types in the project area re (i) Tidal swamp forest (mangrove forest) 1A/C1. (2) Littoral forest 4A/L1 (3) Andaman moist deciduous forest 3A/C1 (4) A ndaman semi-evergreen forest 2A/C1 (5) Southern hill top tropical evergreen forest 1A/C3 (6) Andaman Tropical Evergreen forest 1A/C2 (7) Giant Evergreen Forest 1A/C1, classified by Sir H. Champion and Shri S.K. Seth, formed mainly on the function of edaphic or climatic factors. But these types of forests are not distinctly demarcated.

The distribution of the species within the project area is very compact and even. Padauk (Pterocarpus dalbergioides) is the pride among the species found in these Islands. The occurrence of Padauk is more abundant in North Andaman and the density gradually becomes less towards the other parts of the Islands (in Andaman group) and is totally absent in Little Andamans. Interestingly, the occurrence of the other luxuriant species Gurjan (Dipterocarpus species) is just opposite as it is dense in Little Andamans and gradually becomes thin towards Andaman groups. Its frequency of occurrence is comparatively less in North Andamans. The other important species which are found evenly distributed within the project area are Papita (Pterocevmbium tinctorium), Toung peinne (Artocarpus chaplasha), Jaiphal (Myristica spp.), Marble wood (Diospyros spp.) and Pterospermum acerioides.

The tidal swamp forest in the project area occupies the saline and muddy areas of the sides of the creeks. Mangrove forests are very thick and uniform throughout. T he forests on creek banks sometimes extend upto 100 m. and serve as a direct support against the soil loss. Approach in these types of forests is difficult due to the stilt roots and breathing roots. The principal in mangrove type of forests are Rhizophora and Bruguiera. Rhizophora is thick and smooth and crop height is less while Bruguiera is scattered, less dense and the height is considerably high.

Topography has a little influence over the distribution of the forests within the project area. The vegetation becomes thin at the hill top while the density is maximum at the foot hills and vallies due to edaphic factor that plays an important role in the distribution of vegetation within the Islands.

Besides this, so far 200 species of known and unknown tree species, the forests of the project area comprises of different shrubs, climbers and herbaceous plants. The most common shrubs are Colubrina asiatica, Smythea calpicarpa and Crinum asiaticum. Above the sea beaches the twining growth of Ipomoea biloba, Vigna retusa and the delicate Clitoria ternatea is often observed. The main climbers are Calamus andamanicus, Delima sarmentosa, Acacia pennata, Ventilago madraspatana and others. A few species of bamboo like Oxytenanthera nigrocialata and Dinochloa andamanica lie scattered in the forests of the project area.

The floristic composition in these Islands is precious. It is one of the richest flora in the world. Both compositionally and taxonomically the forests present a variegated paradise for a Botanist.

2.2. Forest Type:

The forest and the vegetative cover of the project area have been classified by Sri H. Champion and Sri S.K. Seth into seven major forest types. The classification is based on edaphic or the climatic factors. However, these forest types are not distinctly demarcated each other and imperceptibly merge with each other to form an intimate mixture.

1) 4B/1 S2 Tidal swamp forest(Mangrove):

These forests are confined to low lying banks of creeks and sheltered portion of the coast line subject to the tidal effect. They occur in belts of varying depth of a few metres to several metres on the saline alluvial soil and serve as the protection to the soil loss. The important species comprising these forests are, Rhizophora mucronata, Bruguiera gymnorrhiza, Bruguiera parviflora, Carapa obovata & Sonneratia acida.

2) 4A/L1 Littoral Forest:

These forests, found on alluvial high level soil along the sea coast beyond the reach of the sea, form the most striking species like Minusops littoralis, Tetrameles nudiflora, Terminalia catappa, Calophyllum inophyllum, Hernandia peltata, Thespesia populnea, Pongania glabra and Barrintonia species. These forests are found just above the mangrove forest on plain land and are restricted to a very limited area. They neither occur on extensive areas nor do they yield any substantial quantity of any valauable timber and as such, they are not of much economic importance.

3) 3A/C1 Andaman Moist Deciduous Forests:

This is one of the important forest types in the project area and is composed of multistoreyal forest. It serves as an important source of match wood species as Canarium euphyllum, Salmalia insignis, and Pteroceymbium tinctorium. This type of forest is mainly found on shallow sandy or clay loam soils formed from the hard coarse grained sand stone with bands of shales and conglomerate and is found on hills upto an elevation of 100 m. Important timber species found mainly in this forest type are Pterocarpus dalbergioides, Terminalia bialata, Terminalia manii, Terminalia procera, Canarium euphyllum, Pteroceymbium tinctorium, Salmalia insignis, Lagerstroemia hypolenca, Tetrameles nudiflora, Chukrasia tabularis, Albizzia lebbek, Lannea coromendelica, Adenanthera pavonina, Diospyros marmorata and Sageraea elliptica.

4) 2A/C1 Andaman Semi-evergreen Forests:

This is the main forest type in the project area with mostly giant trees both of evergreen and deciduous nature. These tree species are found in mixture and sometimes they form groups. Climbers in evergreen forests are very big and heavy. Bamboos may or may not occur in this type.

This type of forests are mainly confined to the main vallies on well drained immature alluvial soil, sufficiently old and raised above the level of salinity. This is a multi storeyed forest with the composition of Dipterocarpus alatus, Dipterocarpus pilosus, Pterygota alata, Pteroceymbium tinctorium, Terminalia bialata, Terminalia procera, Albizzia lebbek, Albizzia chinensis, Calophyllum soulattri, Salmalia insignis, Artocarpus lakoocha, Artocarpus chaplasha, Pterocarpus dalbergioides and Lagerstroemia hypoleuca.

5) 1A/C3 Southern Hill-top Tropical Evergreen Forest:

Tropical evergreen forest occurs on the top of the hills as well as on the steep slopes. The soil depth here is very poor and is exposed due to wind blow and heavy rain fall. The vegetation is comparatively poor in growth in this zone. Important species occurring in this type of forests are Dipterocarpus costatus, Mesua ferrea, Canarium manii, Harpullia caupanioides, Hopea andamanica, Cratoxylon formosum, Euphorbia tingona. This type is mainly with less commercial important species.

6) 1A/C2 Andaman Tropical Evergreen Forests:

These are multistoreyed evergreen forests and are not as luxurient as that of the giant evergreen forest specially in size and the density of the top-storey. So the first canopy is irregular and there are few species in it. This type is mostly seen on the lower hills and moist deciduous crops are frequently found on the slopes. This is an important forest type with numerous commercial important species.

Common species occurring in this type are Dipterocarpus grandifloras, Dipterocarpus pilosus, Artocarpus chaplasha, Artocarpus gomeziana, Callophyllum soulattri, Planchonia andamanica, Hopea odorata, Endospermum chinensis, Sideroxylon longepetiolatum, Xanthochymus andamanicum, Myristica andamanica, Baccaurea sapida, Dimochloa andamanica.

7) 1A/C1 Giant Evergreen Forest:

This is the most luxuriant type of forest amongst all the types in the project area with a multi storeyed crop. The top canopy is covered by the giant trees of evergreen type with an irregular distribution. These forests are seen on the sides of the banks of sweet water streams, where soil is comparatively deep. The important species occurring in this type are Dipterocarpus alatus, Artocarpus gomeziana, Sideroxylon longepetiolatum, Amoora wallichii, Sterculia campanulata, Pometia pinnata and Mesua ferrea.

2.3. Land use:

In general, the Andaman forests are owned by the State, as all the land in Andamans is owned by the Government. About 90% of the total geographical area of Andaman Islands are under forest cover. The extent and density of forest is more in North Andamans than in South and Middle Andamans. Total forested area in North Andamans is now managed by the Forest Department and by the newly developed Andaman and Nicobar Forest and Plantation Development Corporation Ltd., for forestry purposes.

The primary objective of land use in the project area is forestry and gradual development of these Islands after settlement of the settlers is the secondary objective. In North Andamans, various patches of land are clearfelled for the settlement purpose and as a result agricultural activities have been intensified. In this way a secondary land use class have been developed. Besides, barren lands of grassy blanks and valley areas have been planted by Cocomut, Oil-palms and Orchards.

As the Islands are covered with thick forest from the edge of the high tide level no sea shore have been developed in many areas. Even, where sea shore is developed, it remains as an useldss sandy beach under Forest area. Agricultural practice among the settlers are still unscientific and no modern implementation have yet come into practice and only one crop is raised every year.

No barren or fallow land is found in the project area except muddy banks of the creeks which remain unused under the forest area.

2.4. Demarcation:

In 1963, all the forest area of North Andaman Division was declared as Protected forests. Later on some forest areas were declared as Reserved Forests. No clear demarcation lines have been delineated to demarcate the forests. Recently the Survey Of India surveyed the Islands of the project area and demarcated lines between the Reserve and Protected Forests. The high water line has been considered as the outer boundary of Reserve Forest.

2.5. Legal status:

The entire forest areas of North Andaman Division were under the provisions of the Andaman Administration Circular No.18 and the authority was derived from Regulation III of 1876. But there was no legal status of the forest of this Division till 1936, when the Indian Forest Act was extended to whole of Andaman Islands vide Notification No.16 of 1936 of the Chief Commissioner of Andaman and Nicobar Administration. But even after the issue of the circular, the forests of this Division were not formally classified as 'Reserved Forests' or 'Protected Forests'. After a long span of 27 years, the forests of the North Andaman Division were declared as 'Protected Forests' vide Chief Commissioner's Notification No.115/47-5/60 of 1963 issued under section 29 of Indian Forest Act, 1927.

In 1971, some areas of North Andaman Division were declared 'Reserved' but its extent is very limited and the boundaries of the Reserves were not clearly detected. As per the records of North Andaman Forest Division, the extent of R.F. is only about 16% of the total forest area.

2.6. Natural Resources:

Besides the luxuriant forest wealth, the North Andaman group of Islands are also very rich in natural resources, both from geological and zoological point of view. Various types of colourful 'Sea Shells' are collected from the vast sea area of the Islands in the project area and used for making beautiful ornaments and house decoration. These are also exported in huge quantity. Sea fishes are collected in huge quantity for export. The 'nests of the bird Swift' (Howabills') is another important and interesting natural resources of this group of Islands. These nests are of great medicinal value and are collected in a small scale. The multiplication of domestic [illegible] elephants have paved the path of exploitation of natural resources on commercial basis. Deer skin and venison are also being utilized as a natural, economic natural resources by the people of this group of Islands.

Recently the Oil and Natural Gas Commission found oil and natural Gas resources from the Sunken Arakan hill within the project area. But the rock of these hills are not very hard and experiments still going on for commercial exploitation of this resources of the area.

2.7. Forest Resources:

Since time immemorial the forest wealth of the Andaman Islands are very rich. Over two hundred known and unknown species of trees and varieties of shrubs, climbers, canes and bamboos make the forests of this division a paradise for the Botanists. Except for the cleared lands for settlements and some small barren Islands, the entire land mass of this Division is covered with green vegetation and with almost impenetrable growth of luxuriant trees. The forests of this division seems to be better stocked than that of Middle and South Andamans. Mangrove forests are mainly confined to the low lying banks of creeks and sheltered portion of the Sea coast are rich in potentiality.

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In these forests(excluding the mangrove forests) the growing stock is characterised by an intimate mixture of different species, some of which are commercially important. The important species are: Pterocarpus dalbergioides (Padauk), Terminalia bialata(white Chuglan), Pterocoymbium tinctorium(Patrita), Dipterocarpus spp.(Gurjan), Diospyros marmorata(Marble wood), Salmalia insignis(Didu), Terminalia procera(Badam), Albizzia lebbek(Kokko) etc. Rhizophora condelaris and Bruguiera conjugata are the species of importance in the mangrove forests.

Heavy rainfall and humid climate have aided in the development of such unlimited forest resources of the area. The remoteness of the area and the transport difficulties have stood as a barrier against the biotic interference and helped the forests to grow at its own in the past. The soil condition and the environmental situation are also favourable for such richness of forest resources of the region.

But with the advent of modernisation and development of transport facilities in the main land, the exploitation of forests started and the vast untapped resources started to meet human requirement. But only the logs of upper dimension of important species were extracted from the forests for use leaving behind the lower diameter logs and the lops and tops of the felled trees. In context of shortage of pulpwood, the huge bulk of left out portions of timber should assume a great importance.

Among the herbs and shrubs, there is a number of important species, especially from the medicinal point of view. Canes and Bamboos are of poor quality and are not exploited on a commercial basis.

The mangrove species of these area are of good quality. But so far no work have been carried out for the better utilization of the mangrove trees except firewood. The bark of the mangrove trees have more tanin content, but no suitable method has yet been evolved to extract this tanin in a commercial scale.

Due to lack of transport facilities and remoteness of the area, forest resources remains untapped. The extraction of timber in this division for the last three years is given below:-

Year	Volume extracted in m^3
1976-77	8043.159
1977-78	14319.828
1978-79	12803.817

2.8. Distribution of Forest Resources:

The Project area is composed of high density luxuriant growth of mixed forest. The forests are of various types and the main forest types being (i) Andaman moist deciduous forests(ii) Andaman Semi-evergreen forests (iii) Mangrove forests. The important species occurring in these types of forests are most valuable and commercial timbers such as Pterocarpus dalbergioides(Padauk), Terminalia bialata (Silver grey), Terminalia procera(Badam), Diospyros marmorata(Marble wood), Sageraea elliptica(Chooi), Albizzia lebbek(Koko). Also these types of forests are the main source of match wood species occurring - Salmalia insignis(Didu), Pterocymbium tinctorium(Papita), Canarium euphyllum(White dhup).

The creeks and the coastal areas of most of the Islands have thick and luxuriant growth of mangrove forest. Mangrove forest comprises mainly by Rhizophora and Bruguiera species.

Table - 1
DENSITY OF PLYWOOD SPECIES IN NORTH ANDAMAN
(PER HA. & TOTAL STEMS)

Name of the species	Stems/ha.	Total estimated stems ('000 units)
1. Dipterocarpus species	16.511	2617.372
2. Amoora wallichii	1.015	160.931
3. Parishia insignis	3.341	529.732
4. Terminalia bialata	2.157	341.979
5. Terminalia procera	6.288	996.881

Table- 2.
DENSITY OF MATCH WOOD IN NORTH ANDAMAN
(PER HA. & TOTAL STEMS)

Name of the species	Stem/ha.	Total estimated stems ('000 units).
1. Canarium euphyllum	2.650	420.210
2. Endospermum malaccense	0.366	58.114
3. Anthocephalus cadamba	0.972	154.226
4. Salmalia insignis	1.621	257.043
5. Sideroxylon longepetiolatum	2.552	404.563
6. Pterocymbium tinctorium	9.870	1564.612

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Table - 3.

DENSITY OF ORNAMENTAL WOOD IN NORTH ANDAMAN.
(PER HA. & TOTAL STEMS)

Name of the species	Stems/ha.	Total estimated stems ('000 units)
1. Sageraea elliptica	3.017	478.324
2. Diospyros marmorata	8.037	1274.041
3. Murraya paniculata	0.042	6.705
4. Podocarpus nerifolia	0.084	13.410
5. Pterocarpus dalbergioides	6.711	1063.936

Table - 4.

DENSITY OF CONSTRUCTIONAL WOOD IN NORTH ANDAMAN.
(PER HA. & TOTAL STEMS)

Name of the species	Stems/ha.	Total estimated stems ('000 units)
1. Artocarpus chaplasha	7.910	1253.924
2. Artocarpus lakoocha	4.356	690.664
3. Hopea odorata	0.733	116.228
4. Pajnelia longifolia	2.664	422.445
5. Adenanthera pavonina	0.831	131.874
6. Planchonia andamanica	3.158	500.675
7. Diploknema butgracea	1.311	207.869
8. Lannea coromandelica	5.527	876.182
9. Lagerstroemia hypoleuca	3.200	507.381
10. Terminalia manii	2.072	328.568
11. Calophyllum inophyllum	0.014	2.235
12. Manilkara littoralis	0.860	136.344
13. Albizzia lebbek	1.635	259.278

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Analysis of the enumeration data of North Andaman show the following number and the percentage of occurrence of different species of timbers with respect to the total number of trees(which is 25215).

Table - 5.

Sl. No.	Name of the species	Total No. of trees.	Percentage
1.	Dipterocarpus species	1171	4.644
2.	Amoora wallichii	72	0.285
3.	Parishia insignis	237	0.939
4.	Terminalia bialata	153	0.606
5.	Terminalia procera	446	1.768
6.	Canarium euphyllum	188	0.745
7.	Endospernum melacennis	26	0.103
8.	Anthocephalus cadamba	69	0.273
9.	Salmalia insignis	115	0.456
10.	Sideroxylon longepetiolatum	181	0.717
11.	Pterocymbium tinctorium	700	2.782
12.	Artocarpus chaplasha	561	2.227
13.	Artocarpus lakoocha	300	1.225
14.	Hopea odorata	52	0.206
15.	Pajnelia longifolia	189	0.749
16.	Adenanthera pavonina	59	0.234
17.	Planchonia andamanica	224	0.888
18.	Diploknema butyracea	93	0.368
19.	Lannea coromendelica	392	1.554
20.	Lagerstroemia hypoleuco	227	0.900
21.	Terminalia manii	147	0.583
22.	Calophyllum inophyllum	1	0.004
23.	Manilkara littoralis	61	0.241
24.	Albizzia lebbek	116	0.460
25.	Sageraea elliptica	214	0.848
26.	Diospyros marmarata	570	2.264
27.	Murraya paniculata	3	0.110
28.	Podocarpus nerifolia	6	0.023
29.	Myristica species	1731	6.870
30.	Duabanga sonneritioidds	1	0.004
31.	Albizzia stipulata	32	0.126
32.	Mangifera andamanica	126	0.499

Sl. No.	Name of the species	Total No. of trees.	Percentage
33	Alstonia scholaris	7	0.027
34.	Tetrancles nudiflora	146	0.579
35.	Pterygota alata	11	0.043
36.	Gmelina arborea	3	0.110
37.	Sterculia vilosa	397	1.574
38.	Spondiana mangifera	133	0.527
39.	Nauclea gageana	105	0.416
40.	Ponetia pinata	335	1.407
41.	Antiaris toxicaria	22	0.087
42.	Eugenia species	160	0.634
43.	Ganophyllum falcatum	26	0.103
44.	Terminalia catappa	130	0.515
45.	Milinsa tectona	162	0.721
46.	Aglaia andamanica	220	0.872
47.	Xanthophyllum andamanica	133	0.527
48.	Bischofia javanica	5	0.019
49.	Dillenia pentagyna	131	0.319
50.	Artocarpus goneziana	39	0.154
51.	Hibiscus tiliaceous	6	0.023
52.	Others	12317	48.857
53.	Pterocarpus dalbergioides	476	1.887
54.	Baccaria sapida	218	0.864
55.	Diospyros species	872	3.472
56.	Pterospermum acerolides	649	2.577

Table - 6.

DENSITY OF MANGROVE SPECIES IN NORTH ANDAMAN.

(PER HA. & TOTAL STEMS)

	Name of the species	Stems/ha.	Total estimated stems ('000 units)
1.	Rhizophora candolaris	800.690	23423.396
2.	Bruguiera conjugata	427.089	12494.079
3.	Bruguiera parviflora	1.915	56.021
4.	Aviconnis officinalis	148.975	4358.120
5.	Heritiera littoralis	4.377	128.062
6.	Other Mangrove species	48.016	1404.683

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Mangrove forest is typically a closed evergreen forest with trees of specially adopted to survive on the tidal swamp area which is mostly covered with mud and permanently wet with salt water and submerged during high tide. Tree growth in mangrove forest is very thick and height is moderate. These forests are rarely developed on the open sea face and never on the sandy banks.

2.8.1 Resources of four principal Andaman Forest Divisions - A comparative study

Simultaneously with the completion of data processing of North Andaman inventory data, detailed data of Middle & South Andamans was also to hand. This led a comparative study of the four divisions viz., Little Andaman, North Andaman, Middle Andaman & South Andaman.

The following detailed study should reveal various interesting and striking feature of the forests of these four divisions :-

STATEMENT NO. 1

Utility class & division-wise volume (m^3) per hectare.

Utility class	Divisions					
	Little Andaman			N.Andaman	M.Andaman	S.Andaman
	Littoral.	Deciduous.	Evergreen.	Tropical rain forest.	Tropical rain forest.	Tropical rain forest.
Plywood	14.026	40.019	30.703	20.882	19.155	29.462
Matchwood	23.813	36.921	39.065	11.633	8.874	16.279
Constructional wood	99.551	25.232	29.051	16.675	17.572	15.777
Ornamental wood	-	-	-	18.201	31.551	14.778
Non-commercial wood	78.497	84.517	76.934	28.648	34.414	31.041
Residual wood	67.008	76.827	71.979	65.278	66.301	76.691
Small wood	15.417	19.432	18.260	51.668	42.026	43.689

(i) Various categories of utility class timber, Non-commercial timber, Residual timber and Small wood timber do not show significant difference in the main three Andaman Divisions.

(ii) Little Andaman does not have Padauk and therefore, there is no figure under Ornamental wood.

(iii) There is significant increase in volume of Plywood, Match wood and Constructional wood in Little Andaman.

(iv) Small volume under Match wood in the three main Andaman Divisions could be due to use in bulk quantity as floater.

STATEMENT NO.2

DIVISION-WISE TOTAL UTILITY CLASS VOLUME (IN '000 M^3)

Divisions	Stratum	Plywood volume.	Match wood volume.	Constructional wood volume.	Ornamental wood. vol.	Non-commercial wood volume.	Residual wood vol.	Small wood volume.
Little Andaman	Littoral	18.739	31.815	133.001	-	104.872	89.523	20.598
	Deciduous	227.830	210.195	143.467	-	481.158	437.381	110.630
	Evergreen	1789.672	2277.053	1693.334	-	4484.377	4195.557	1064.339
North Andaman	Tropical rain forest	3312.886	1846.031	2648.144	2886.181	4545.027	10347.959	8190.206
Middle Andaman	Tropical rain forest	1205.593	558.521	1105.964	1985.800	2165.983	4172.909	2645.079
South Andaman	Tropical rain forest	1808.412	999.226	968.410	907.090	1905.330	4707.377	2681.687

This does not invite any analysis as the position has already been enumerated in Statement No.1.

In Little Andaman Evergreen forest comprise of 95% of the total forest areas and therefore for comparative study Littoral and Deciduous forest may be ignored.

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STATEMENT NO.3

DIVISION-WISE DIAMETER CLASS VOLUME (M^3)/HA. (EXCEPT MANGROVE SPECIES)

Division	Diameter Classes (in Cm.)										
	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total
Middle Andaman	25.643	28.716	25.179	24.755	19.149	15.720	14.363	11.392	5.926	49.050	219.893
South Andaman	26.085	33.382	30.926	31.957	26.128	21.983	14.123	11.218	6.994	24.921	227.717
North Andaman	35.010	31.315	27.286	23.820	20.326	14.940	11.176	11.228	7.326	30.457	212.884
Little Andaman		24.531	22.631	28.534	29.985	33.534	28.834	25.999	10.971	63.249	268.268

The above table shows the following:-

(i) While diameter class was measured down to 10-19 cm. in the three main Andaman Divisions, it was down upto 20 cm. in case of Little Andaman.

(ii) Total volume per hectare remains more or less identical in the three main Andaman Divisions. In Little Andaman it is far too high inspite of the fact that volume of trees in (10-19 cm.)diameter class has not been added to it.

(iii) Little Andaman has a large number of matured trees and less of young regeneration.

(iv) Volume in mid-girth class is high in North and South Andamans and is probably due to the fact that exploitation of trees in mid-girth class seems to have been more in North and South Andamans or may be due to lesser number of trees in the diameter classes in Middle Andaman.

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STATEMENT NO. 4

DIVISION-WISE DIAMETER CLASS & TOTAL VOLUME (IN '000 M^3) (EXCEPT MANGROVE SPECIES)

Divisions	Diameter Classes (in cm.)										
	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	TOTAL
Middle Andaman	1613.917	1807.392	1584.783	1558.091	1205.199	989.384	903.979	716.989	372.968	3087.147	13839.849
South Andaman	1601.129	2049.044	1898.293	1961.519	1603.760	1349.340	866.887	688.583	429.313	1529.664	13977.532
North Andaman	5555.044	4968.107	4329.354	3779.518	3225.320	2370.837	1773.783	1781.700	1162.736	4830.034	33776.433
Little Andaman		1602.314	1478.200	1863.793	1958.560	2190.367	1883.357	1693.185	716.639	4131.240	17517.645

This does not invite any analysis as the portion has already been explained in Statement No. 3.

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STATEMENT - 5

SPECIES-WISE TOTAL VOLUME (M^3) PER HECTARE ABOVE EXPLOITABLE DIAMETER CLASSES (60 to 100+ cm) AND BELOW (10 cm to 59 cm.)

NAME OF THE SPECIES	NORTH ANDAMAN				MIDDLE ANDAMAN				SOUTH ANDAMAN				LITTLE ANDAMAN			
	10-29	30-59	Total	60-100+	10-29	30-59	Total	60-100+	10-29	30-59	Total	60-100+	20-29	30-59	Total	60-100+
1. Dipterocarpus species.	4.691	6.065	10.756	12.135	2.130	4.494	6.624	10.816	8.032	13.913	21.945	15.454	0.713	3.560	4.273	19.758
2. Parishia insignis	0.536	1.248	1.784	1.061	0.619	2.359	2.978	1.762	1.489	4.768	6.257	2.741	0.040	0.469	0.509	3.164
3. Terminalia bialata	0.323	1.486	1.809	2.844	0.188	0.680	0.868	2.032	0.150	0.771	0.921	1.173	0.032	0.847	0.879	4.787
4. Terminlia procera	0.959	3.940	4.899	2.408	0.627	2.737	3.364	1.720	1.072	3.595	4.667	3.360	0.120	1.525	1.645	6.282
5. Salmalia insignis.	0.209	0.936	1.145	0.635	0.159	0.814	0.973	0.830	0.196	0.540	0.736	2.226	0.081	0.594	0.675	12.103
6. Artocarpus chaplasha.	1.605	3.322	4.927	2.614	0.652	2.345	2.997	1.203	1.221	4.358	5.579	1.017	0.553	2.478	1.031	16.174
7. Lagerstroemia hypoleuca	0.542	0.833	1.375	1.581	0.787	1.738	2.525	5.474	1.081	1.819	2.270	1.461	0.008	0.194	0.202	3.025
8. Pterocarpus dalbergioides	0.748	2.480	3.228	21.107	0.798	3.087	3.885	37.314	0.593	3.600	4.193	16.207	-	-	-	-
9. Other species	56.712	51.122	107.834	30.742	48.399	50.829	99.228	35.300	45.633	55.647	101.280	35.600	22.986	71.485	94.471	97.220
TOTAL	66.325	71.432	137.757	75.127	54.359	69.083	123.442	96.451	59.467	89.011	148.478	79.239	24.533	81.152	105.685	162.513

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A perusal of Table number 5 points out the following facts :-

(i) Deiptercarpus species :

Regeneration seems to be meagre in Little Andaman (10-19 cm. trees are not considered). South Andaman has profuse regeneration, while Middle Andaman has the least in the three divisions namely South, Middle and North Andaman.

Further South Andaman also has maximum number of middle aged poles in the diameter class 30-59 cm. and the volume outturn under this class is also maximum.

(ii) Pterocarpus dalbergioides :

The volume per hectare does not differ significantly in the lower diameter classes in the three divisions. But Middle Andaman has got substantial volume in the diameter class below 60 cm. - 100 cm. and above.

(iii) Other species :

There is no notable feature in the distribution of volume in other species except in Little Andaman.

STATEMENT NO.6

SPECIES WISE TOTAL VOLUME (in 000 M^3) ABOVE EXPLOITABLE DIAMETER CLASSES (60 to 100 +) AND BELOW (10 cm. to 59 cm.)

ANDAMAN

Name of Species	NORTH ANDAMAN			MIDDLE ANDAMAN			SOUTH ANDAMAN			LITTLE ANDAMAN		
	10-29	30-59	60-100+	10-29	30-59	60-100 +	10-29	30-59	60-100 +	10-29	30-59	60-100 +
Dipterocarpus species	748.179	961.746	2391.201	134.059	282.846	681.106	493.006	853.993	948.588	46.542	232.546	1290.528
Parishia insignis	85.240	198.115	168.607	38.959	148.471	110.896	91.401	292.665	168.243	2.586	30.628	206.628
Terminalia bialata	51.227	235.647	451.333	11.831	42.797	127.890	9.246	47.320	71.985	2.099	55.289	312.668
Terminalia procera	152.224	624.836	382.161	29.462	194.921	149.415	65.793	220.650	206.276	7.807	99.623	410.306
Salmalia insignis	33.196	148.552	101.159	10.006	51.231	52.239	12.010	33.133	136.667	5.271	38.803	790.525
Artocarpus chaplasha	247.509	526.771	414.763	41.038	147.590	75.714	74.955	224.591	62.421	36.147	161.844	1056.415
Lagerstroemia hypoleuca	86.199	132.328	308.898	49.532	109.387	344.524	66.352	72.979	89.666	0.493	12.646	197.568
Pterocarpus dalbergioides	118.839	393.363	3346.269	50.288	194.354	2348.376	36.410	220.971	994.790	-	-	-
Other species	9000.538	8112.834	4354.699	3056.134	3176.476	2180.307	2801.000	3497.270	2185.151	1501.369	4669.174	4350.140
T O T A L	10523.151	11334.192	11919.090	3421.309	4348.073	6070.467	3650.173	5463.572	4863.787	1602.314	5300.553	10614.778

The table is self explanatory as the analysis is already provided in table No.5.

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STATEMENT - 7

DIVISION WISE STEMS PER HECTARE BY DIAMETER CLASSES (CM)

ANDAMAN

	DIAMETER CLASSES (in cm)										
DIVISIONS	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total
MIDDLE ANDAMAN	221.288	69.864	28.037	15.734	7.807	4.461	2.940	1.741	0.710	2.535	355.117
SOUTH ANDAMAN	225.688	82.907	35.273	20.619	11.430	6.430	3.206	1.831	0.931	1.706	390.121
NORTH ANDAMAN	218.962	69.953	30.238	15.660	8.584	4.485	2.459	1.924	1.025	2.096	355.386
LITTLE ANDAMAN	-	48.18	27.80	19.90	13.02	9.65	5.90	3.92	0.74	4.10	133.71

Total stems/ha. does not differ significantly in the divisions. Obviously 2/3rd of the trees belong to the diameter class 10 - 19 cm.

Little Andaman has got maximum number of trees above 60 cm. diameter in comparison to other Divisions.

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STATEMENT - 8

DIVISION WISE TOTAL STEMS (in 000 unit) BY DIAMETER CLASSES (CM)

DIVISIONS	DIAMETER CLASSES (in cm)										
	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total
MIDDLE ANDAMAN	13927.658	4397.181	1764.608	990.257	491.398	280.791	185.066	109.551	44.665	159.542	22350.717
SOUTH ANDAMAN	13852.979	5088.899	2165.070	1265.594	701.574	394.694	196.814	118.508	57.137	104.755	23946.024
NORTH ANDAMAN	34714.244	11093.076	4796.632	2485.474	1363.430	713.003	391.139	306.208	163.161	333.032	56359.399
LITTLE ANDAMAN	-	3140.843	1816.697	1300.583	851.018	630.517	385.455	256.263	84.124	267.651	8739.281

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STATEMENT - 9

SPECIES WISE CLASSIFICATION OF STEMS PER HECTARE ABOVE EXPLOITABLE DIAMETER CLASSES

(60 to 100 cm & above)AND BELOW (10cm to 59cm)

NAME OF THE SPECIES.	NORTH ANDAMAN				MIDDLE ANDAMAN			
	10-29	30-59	Total	60-100+	10-29	30-59	Total	60-100 +
1. Dipterocarpus species.	10.969	3.905	14.874	1.633	9.735	2.856	12.591	1.419
2. Parishia insignis.	2.129	0.971	3.100	0.238	2.031	1.639	3.670	0.372
3. Terminalia bialata.	0.845	0.929	1.774	0.379	0.794	0.439	1.233	0.203
4. Terminalia procera.	3.200	2.650	5.850	0.435	1.809	2.079	3.888	0.489
5. Salmalia insignis.	0.732	0.746	1.478	0.140	0.777	0.777	1.554	0.171
6. Artocarpus chaplasha.	4.581	2.846	7.427	0.478	2.451	1.774	4.225	0.321
7. Lagerstroemia hypoleuca.	2.241	0.549	2.790	0.407	4.124	1.115	5.239	0.811
8. Pterocarpus dalbergioides.	2.439	1.635	4.074	2.634	2.468	1.453	3.891	2.687
9. Other Species.	261.779	40.251	302.030	5.645	266.963	39.446	306.409	5.914
TOTAL	288.915	54.482	343.397	11.989	291.152	51.578	342.730	12.387

Dipterocarpus species :

South Andaman has got profuse regeneration almost 3 - 4 times of other divisions. It has also maximum number of stems per hectare above 60 cm. diameter.

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SOUTH ANDAMAN.				LITTLE ANDAMAN.			
10-29	30-59	Total	60-100+	20-29	30-59	Total	60-100 +
33.997	9.896	43.893	3.068	1.240	2.298	3.538	2.481
6.034	3.379	9.413	0.603	0.073	0.322	0.395	0.424
0.603	0.552	1.155	0.207	0.076	0.384	0.460	0.520
3.086	2.380	5.466	0.721	0.282	0.833	1.115	1.035
1.103	0.509	1.612	0.328	0.272	0.372	0.644	1.257
4.896	3.224	8.120	0.310	0.940	1.962	2.902	2.013
6.570	0.930	7.500	0.276	0.015	0.142	0.157	0.345
2.103	1.792	3.895	1.191	-	-	-	-
250.203	44.660	294.863	7.500	45.286	54.441	99.721	16.789
308.595	67.322	375.917	14.204	48.178	60.754	108.932	24.864

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CHAPTER - III

INVESTIGATION AND METHODOLOGY

3.1. Objectives :

The major objectives of the survey worked out in consultation with the Andaman Forest Department area enumerated as below :-

1. Determination of total growing stock of Plywood, Matchwood, Constructional timber and Ornamental timber within an error of 10% at 95% probability level.
2. Estimation of the volume of Mangrove species in the project area.

3.2. Area reconnaissance, Aerial Photo-interpretation and mapping :

No aerial reconnaissance work was done. Design of work for North Andaman was prepared on the basis of Little Andaman data, as the vegetation of North Andaman is more or less similar to that of Little Andaman.

Aerial photo-interpretation work was carried out by the photo-interpretation unit of the Preinvestment Survey Of Forest Resources, Dehradun. Aerial photo-interpretation unit interpreted and delineated all small details on the scale of 1:25,000 photographs in the laboratory. Thereafter, checking of 10% photographs was done in the field and accordingly a team visited North Andaman during 1978. On completion of field checking, corrections were made on 100% photographs and the details were transferred to the Base map on the scale of 1:25,000 with the help of aerosketchmaster.

Aerial photographic coverage :

Aerial photographas were taken during January - February, 1974 for Naval hygraphic unit for the Andaman and Nicobar Islands and was used in the present case for the purpose of photo-interpretation. The specifications of the photographs are as under:-

1.	Type of photography	: Panchromatic Black & white
2.	Agency	: Indian Air Force.
3.	Specification No.	: 764 A, Area A & B.
4.	Camera used	: R.M.K.
5.	Focal length of the camera	: 15.3 cm.
6.	Flying height	: 12,500'
7.	Format size	: 23 cm. x 23 cm.
8.	Scale of photography	: 1:25,000 for area A. 1:12,500 for area B.
9.	Over lap	: 70% Fore lap.
10.	Direction of flight	: North - South.

The photographs, although satisfactory had the following drawbacks :-

(i) Printing was defective as the total contrasts of similar objects appeared different.

(ii) The photography was carried out during January-February when all deciduous trees do not become deciduous. Had the photography been taken during March-April, all deciduous trees would have become leaf less resulting in an accurate delineation between the evergreen and deciduous forest type.

(iii) Due to security measures, there were unavoidable lapses in the aerial delineation.

The forest and land use classification :

The vegetative types and land use classes used in photo-interpretation are defined as below :-

Forested area.

Man-grove forest.

Mangrove forests are easily distinguished from rest of the forest crop in the aerial photographs because of their gregarious nature. They comprise of a few species of Rhizophoraceae family.

M^1 This type consists mainly of Rhizophora species more or less in pure form. The crop appears to be a wollen carpet in dark tone on the aerial photographs. The is homogeneous, uniform with comparatively lower average height and mostly found in total merged or sub-merged water logging areas along the sea coasts or river mouths.

M^2 This crop consists mainly of Bruguiera species and appear on the aerial photographs to be more or less similar to type M^1 except the tone, which is generally whitish grey or lighter grey. Crop height is more than that of M^1 and it comes on little higher elevations.

M^3 At places the Rhizophora and Bruguiera become inter mixed and it becomes difficult to separate them out.

Evergreen forests :

Evergreen forests includes both categories of evergreen i.e. low hill valley evergreen forests and evergreen forest on hills. This is multistoreyed and the top canopy is formed by tall gigantic trees of which Dipterocarpus species is most common. Other associates are Terminalia bialata, Albizzia stipulata, Artocarpus chaplasha, and Anthocephalus cadamba.

Crown of individual trees is more compact, smaller in size and darker in tone.

Semi-evergreen forests :

This is a transitional type between evergreen and moist deciduous forests and consists of species found both in Evergreen and Moist Deciduous types.

Tone is generally lighter than evergreen but darker than deciduous forests.

Moist Deciduous forests :

These are multistoreyed irregular forests confined mostly to hilly slopes and met with throughout Andaman Islands. The upper storey is mostly of deciduous species, intercepted with occasional evergreen species. The important species coming in these forests is Pterocarpus dalbergioides commonly known as Padauk characterised with other associates like Terminalia bialata, T. Manii, T. procera, slightly lower in height are Canarium euphyllum, Bombax insignis, Tetrameles nudiflora, Chukrasia tabularis and Albizzia lebbeck. The species starts becoming leafless from December onwards and become totally deciduous by the end of March.

These species while leafless appear lighter in tone or whitish on Panchromatic black and white photographs. The tone factor is considered in delineating Deciduous forests from evergreen or semi-evergreen types.

Density classification of forests area :

The density classes used throughout the photointerpretation are based on the extent of the crown cover of over storey trees i.e. dominant and co-dominant trees only.

Three crown covered density classes are recognised.

(i) High density :- Over 60% of crown cover occupied by over storeyed trees.

(ii) Medium density :- From 30 to 60% of crown cover occupied by over storey trees.

(iii) Low density :- From 5 to 30% of crown cover occupied by over storey trees.

Density less than 5% will come in the forest blank category.

Terrain classification:

Three terrain classes have been defined for each delineated unit as given below :-

1. Flat to gently slopping and undulating terrain.

It includes low-lands, flat plains, plateau wide "U" shaped valleys, gently hilly country broken by a series of low hills which form a corrugated or washboard appearance. Average slope do not exceed 7%.

2. Moderately hilly terrain :

It includes moderate long slopes, variable slopes gradient and no steeper in comparison to slopes covered in category 1. Country is usually rough and sharply dissected. Average slope do not exceed 25%.

3. Hilly terrain :

In includes excessively steep country and vertical cliffs. More than half of the area with long continuous slopes having gradients over of 25%.

Method of Annotation :

In each delineated forest type and land use class, prescribed symbols will be denoted. Density classification will be mentioned in numerator and terrain classification in the denominator e.g. E - 1, means the forest belongs to evergreen category and the 2 crop will be of high density (more than 60%). Its terrain type will be moderately hilly.

With the help of aerial photographs the photointerpretation and mapping unit of Preinvestment Survey Of Forest Resources, Dehra Dun has prepared the forest type maps on the scale of 1:25,000 for the area.

The list of toposheets and aerial photographs used for the project area are enclosed below :-

3.3. Inventory design :

The design for the present survey as based on the variability and last data analysis of the Little Andaman data. A stratified random sampling was adopted and cluster of four plots was deemed to be reasonably good for the survey.

Shape/Size :

The cluster would be rectangular in shape - 100 m. in length and 25 m. in width. The rectangular plots will be divided into four sub-plots (25 m. x 25 m.). The enumeration record will be closed at every 25 m. of the length of the rectangular plot. The edge to edge distance between opposite plots is 200 m. (See diagram).

3.3.1. Selection of grids :

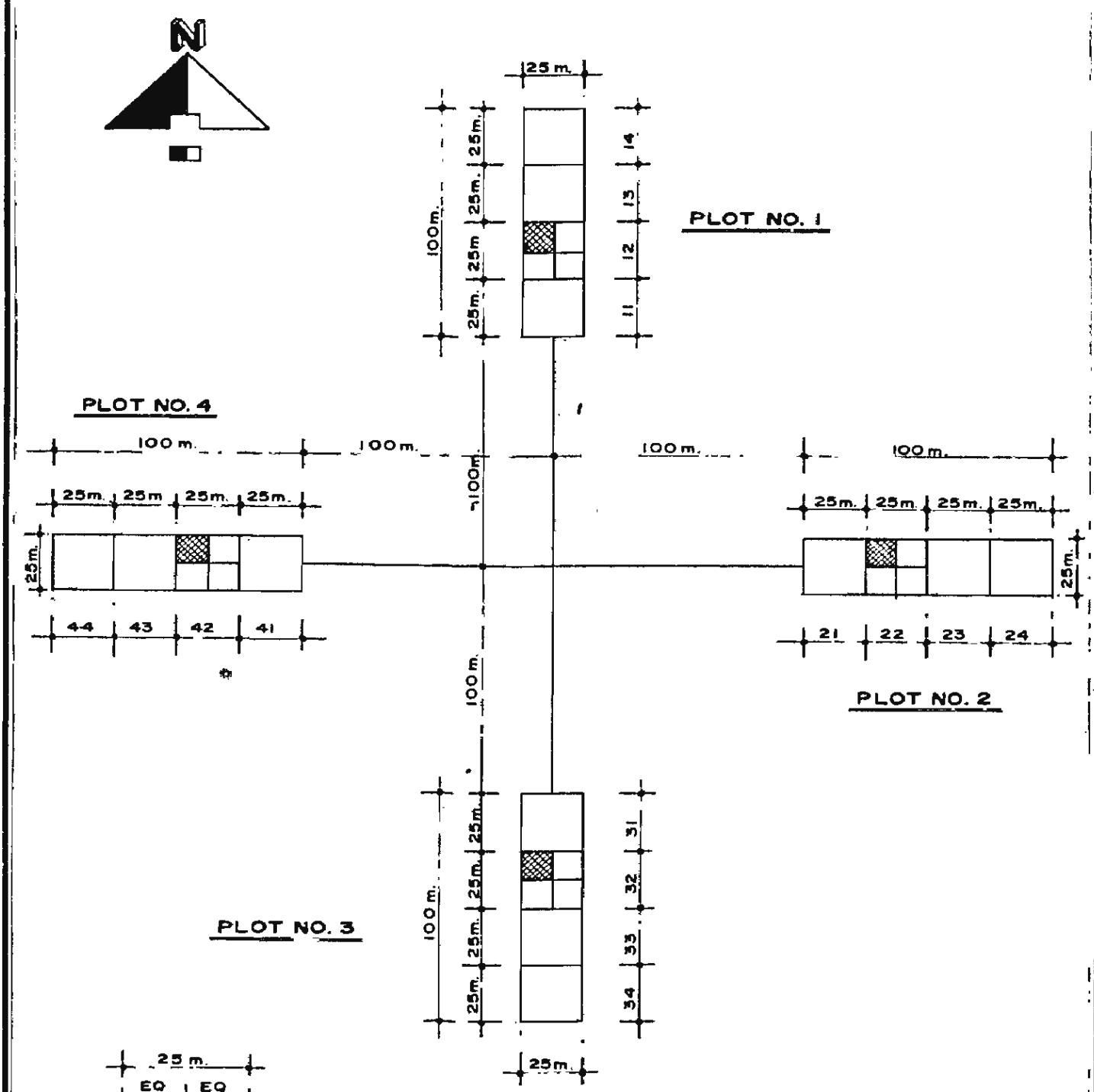
They survey area was divided into 1 km. x 1 km. grids as shown in the diagram. Out of the total number of grids, 89 grids were selected randomly. The grid centres of the randomly selected grids were transferred on aerial photographs to be taken in the field.

3.3.2. Recording of units :

The enumeration data was closed for units of 25 m x 25 m. in each of the plot in a separate form. The numbering of 4 recording units should be as below :-

SURVEY DESIGN FOR NORTH ANDAMAN

SCALE — 1cm = 25m



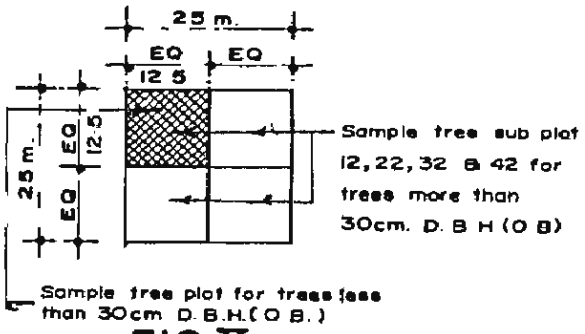


FIG. II

FIG. I

DATE - 2 7 80

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11, 12, 13, 14, 21, 22, 23, 24 etc. (for plots 1, 2, 3 & 4). Sample tree measurements would be done in the recording units - 12, 22, 32,42, Trees would be measured upto clear bole height. Trees more than 30cm. would be recorded in whole recording unit in sub-plots 12, 22, 32, 42 and trees less than 30 cm. (only in North-West quadrant) of each of these recording units.

3.4. Field work in plots :

During field work plots were located with the help of Survey Of India maps. Plots were laid out as per design shown in figure .....

Plot approach form (Form I - Appendix III), Plot Description Form (Form II - Appendix - III), Plot Enumeration Form (Form III - Appendix - III) and Sample Tree Form (Form-IV-Appendix-III) were filled. The explanation of the forms may be found in Appendix-III.

In case of Mangrove forest separate forms were provided to the field parties.

3.5. Data processing :

A series of data processing operation are involved starting from the initial stage of planning to the presentation of the final report.

The data processing steps involved may be summarised the following phases :-

1. Design and data collection.
2. Editing of the data.
3. Estimation of tree volume.
4. Estimation of sampling error.
5. Tabulation.

CHAPTER - IV.

DATA ANALYSIS

4.1 Tree volume study :

The volume equations constructed for Little Andaman were applied for North Andaman to estimate the growing stock of the area. On an analysis of both Little and North Andaman data, it became evident that the vegetation of both the area exhibits very little variation and as such the crop form of both North & Little Andamans were considered same.

4.2 General volume equation :

The following general volume equations were applied for North Andamans :-

Code No.	Name of the species	General equation
001	Dipterocarpus species	$V/D^2H = 0.0000249 + 0.2126/D^2H$
004	Terminalia bialata	$V/D^2H = 0.0000249 + 0.1597/D^2H$
005	Terminalia procera	$V/D^2 = 0.00050 - 0.02415/D^2 + 0.0000148H.$
006	Canarium euphyllum	$V/D^2 = 0.000615 - 0.0468/D^2 + 0.0000139H.$
010	Sideroxylon longipetiolatum	$V/D^2H = 0.0000264+0.11295/D^2H$
011	Pteroceymbium tinctorium	$V/D^2 = -0.000036+0.02059/D^2 + 0.0000268H.$
013	Artocarpus lakoocha	$V/D^2H = 0.00002417 + 0.2275/D^2H$
015	Pajanalia longifolia	$V = 0.4257+0.0000205D^2H$
017	Planchonia andamanica	$V/D^2H = 0.0000215+0.37271/D^2H$
018	Diploknema butyracea	$V/D^2H = 0.00003091 + 0.14932/D^2H$
024	Manilkara littoralis	$V/D^2H = 0.000029+0.08632/D^2H$
058	Others	$V/D^2H = 0.19915/D^2H + 0.000022$

4.2.1 Local volume equation :

The following types of regression equations were tried for some of the important species :-

1) $V = a + bD + CD^2$
2) $V/D = a + bD + CD^2$
3) $V/D^2 = a + bD + CD^2$
4) $V/D^2 = a + b/D + CD + dD^2$
5) $V/D^2 = a + b/D + C/D^2$
6) $V = a + bD^2$
7) $V/D^2 = a + b/D^2$
8) $\sqrt{V} = a + bD$

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Out of various local volume equations tried the following equations were selected after taking into consideration the standard error of estimate, the multiple determination, coefficient and applicability of the equation over the entire range of data :-

SELECTED LOCAL VOLUME EQUATION - NORTH ANDAMAN :

Species Code	Equation
001	$V = 0.4723 - 0.0227D + 0.00108\ D^2$
004	$V/D = 0.014256 + 0.00017769D + 0.0000069D^2$
005	$V/D = 0.008968 + 0.001124D - 0.0000009D^2$
006	$V = 0.004338 - 0.007315D + 0.0011175D^2$
010	$V/D^2 = 0.001098 - 0.00001344D + 0.000000019D^2$
011	$V/D^2 = 0.00026 + 0.00001759D - 0.0000001D^2$
013	$V = 0.1954 - 0.004028D + 0.000609D^2$.
015	$V/D = -0.0029157 + 0.0547/D + 0.0000727D - 0.00000045D^2$
017	$V = 0.0000029 + 0.000768\ D^2$
018	$\sqrt{V} = 0.085958 + 0.030205D$
024	$V = 0.0245 - 0.00497D + 0.000719D^2$
Others	$V = -0.004339 + 0.0007688\ D^2$

4.2.2. Volume table :

The local volume table of these species is given in Table No. 5.1. The abovementioned volume equations are applicable to 10 cm. and above diameter (D.B.H.O.B.) trees. The volume tables give the total volume (under bark) inclusive of branch wood volume down to 5 cm. diameter over bark.

4.3 Tree density studies :

Number of stems per ha. by species and diameter classes has been calculated and is given in Table No. 1.1.1 and for the mangrove species is given in the table No. 1.1.2. These tables give the figures for the entire division.

It may be noted from the tables that stem density is very high i.e. 355-386 ha. and about 61.6% of trees are below 20 cm. diameter and only 10.2% of the trees are above 10 cm. dia. Occurrence of higher diameter class is maximum in case of *Dipterocarpus* species followed by *Pteroceymbium tinctorium*, *Artocarpus chaplasha* and *Terminalia procera*.

Further the distribution of the species according to utility classes are as below :-

Sl.No.	Utility class	% of the total stems
1	Plywood species	5.5
2	Matchwood species	3.8
3	Constructional timber	9.6
4	Ornamental wood	4.2
5	Non-commercial wood	36.0
6	Others	40.8

Thus it is obvious that the density of non-commercial species is maximum. Density of constructional wood species and Plywood species is reasonably good while match wood species is poor. Thi is due to their great demands as a floater resulting in its over exploitation.

4.4 Total stems :

Stems (In '000 unit) for the project area by species and diameter classes are given in the table No. 1.2.1 and for the mangrove species in the Table No. 1.2.2.

4.5 Volume studies :

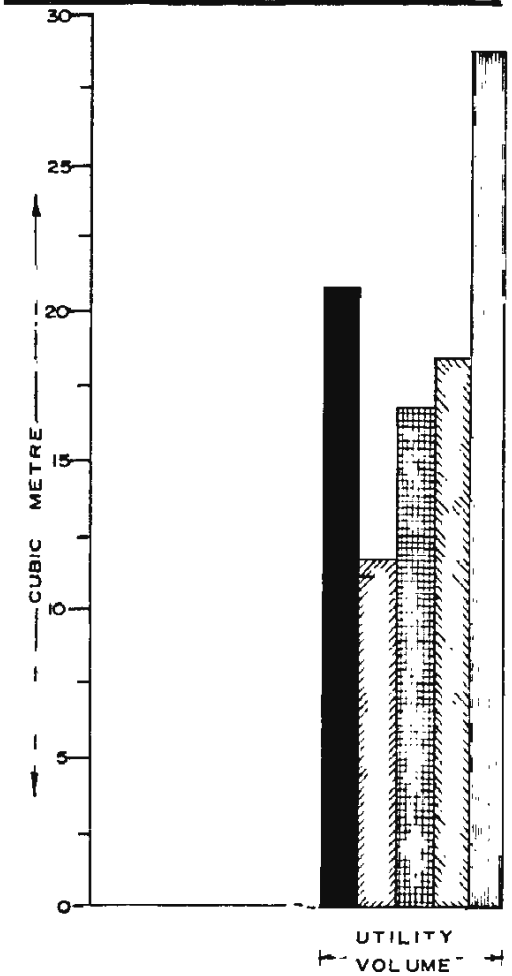
Volume has been calculated separately for thirty one commercial species and thirty non-commercial species. Volume per ha. of different important species by diameter classes for the entire division is given in the Table No. 2.1.0.

It may be noted from the table that stocking is not so high. Average stocking in the division is 212.884 m^3/ha. Dipterocarpus species which are comparatively important from utility point of view account for 14.77% of total volume. The stocking of Pterocarpus dalbergioides is maximum in the division which is 11.43% followed by Pteroceymbium tinctorium and Artocarpus chaplasha which are 4.63% & 3.52%. The stocking of all the commercial species is about 54.00% whereas for the thirty non-commercial species is 18.55%. Miscellaneous or the other species contribute the balance 27.45% of the growing stock.

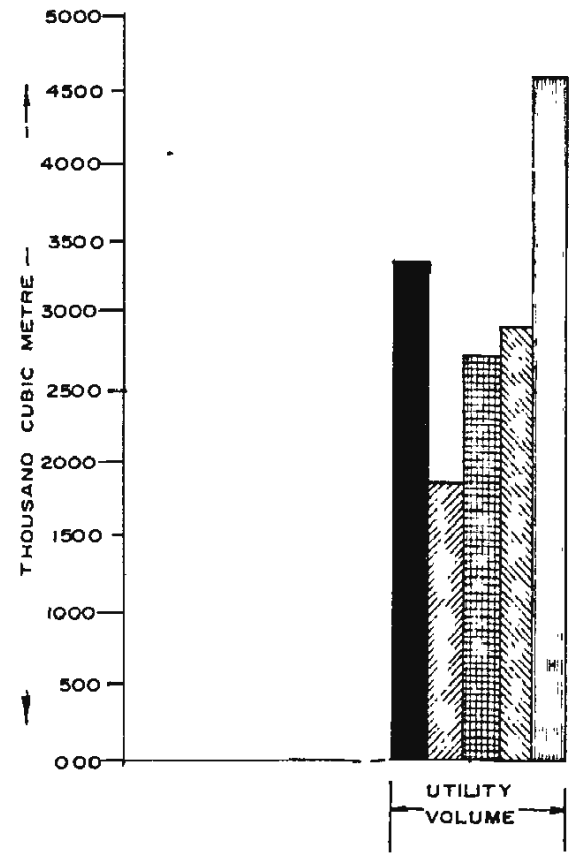
Abstract of volume per hectare for individual commercial species are given below :-

Sl.No.	Botanical Name	Volume/ha(m^3)
1.	Dipterocarpus species	22.918
2.	Amoora wallichii	1.090
3.	Parishia insignis	2.845
4.	Terminalia bialata	4.650
5.	Terminalia procera	7.307
6.	Canarium euphyllum	3.716
7.	Endospermum melaccensis	0.578
8.	Anthocephalus cadamba	0.480

VOLUME PER HECTARE BY UTILITY CLASSES IN NORTH ANDAMAN (M^3)



TOTAL VOLUME BY UTILITY CLASSES IN NORTH ANDAMAN (000M^3)



REFERENCES

- PLY WOOD
- MATCH WOOD
- CONSTRUCTIONAL WOOD
- ORNAMENTAL WOOD
- NON COMMERCIAL WOOD

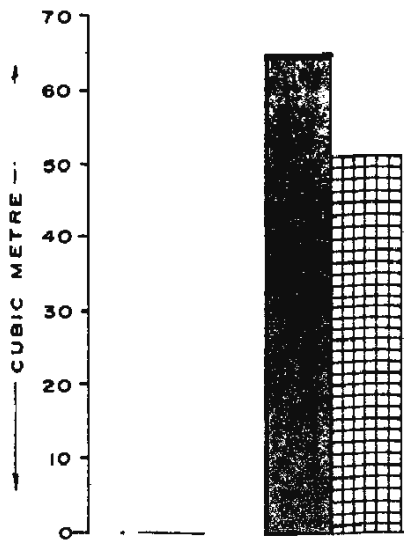
REFERENCES

- PLY WOOD
- MATCH WOOD
- CONSTRUCTIONAL WOOD
- ORNAMENTAL WOOD
- NON COMMERCIAL WOOD

DRAWN BY - BIMAL

Contents

PER HECTARE RESIDUAL AND SMALL WOOD VOLUME (M^3) IN NORTH ANDAMAN

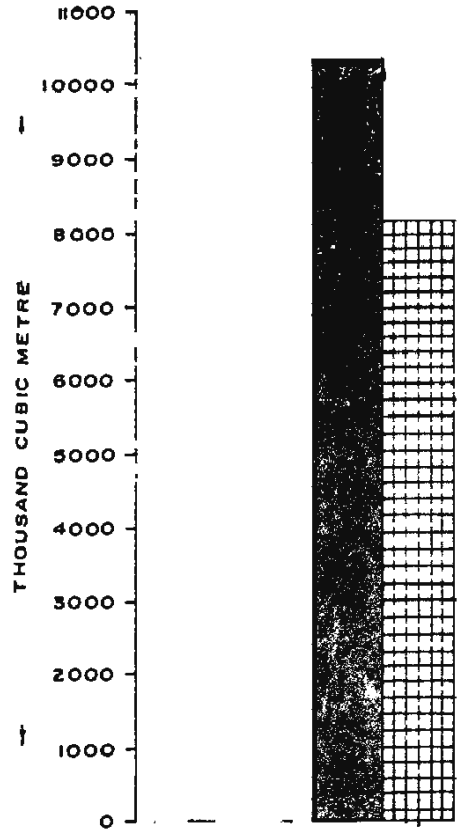


REFERENCES

RESIDUAL WOOD

SMALL WOOD

TOTAL RESIDUAL AND SMALL WOOD VOLUME ('000M^3) IN NORTH ANDAMAN



REFERENCES

RESIDUAL WOOD

SMALL WOOD

DRAWN BY - SUMAN

Contents

Sl.No.	Botanical Name	Volume/ha.(m^3)
9.	Salmalia insignis	1.780
10.	Sideroxylon longepetiolatum	1.234
11.	Pteroceymbium tinctorium	9.854
12.	Artocarpus chaplasha	7.496
13.	Artocarpus lakoocha	2.229
14.	Hopea oderata	0.410
15.	Pajanelia longifolia	2.415
16.	Adenanthera pavonina	0.352
17.	Planchonia andamanica	4.684
18.	Diploknema butyracea	1.958
19.	Mesua ferrea	-
20.	Lannea coromandelica	4.883
21.	Lagerstroemia hypoleuca	3.322
22.	Terminalia manii	2.020
23.	Calophyllum inophyllum	0,001
24.	Manilkara littoralis	0.439
25.	Albizzia lebbek	1.568
26.	Terminalia bialata	-
27.	Sageraea elliptica	0.575
28.	Diospyros marmorata	1.774
29.	Murraya paniculata	0.005
30.	Podocarpus nerifolia	0.029
31.	Pterocarpus dalbergioides	24.335

4.6 Utility volume :

As desired by the Andaman Forest Department five utility classes e.g. Ply, Match, Constructional, Ornamental and Non-commercial were recognised. Besides these utility classes there are two more utility classes e.g., residual and small wood. For details of utility classes, their specification etc. Appendix _____ may be referred. Dipterocarpus, Amoora wallichii, Parishia insignis, Terminalia bialata are the important Plywood species in the project area. Among the matchwood species Canarium euphyllum and Pteroceymbium tinctorium are important. Pterocarpus dalbergioides is abandunt and used as ornamental wood.

The following table will illustrate the utility volume/ha. :-

Utility		Volume/ha(m^3)
Plywood	-	20.882
Matchwood	-	11.633
Constructional wood	-	16.675
Ornamental wood	-	18.201
Non-commercial wood	-	28.648
Residual wood	-	65.270
Small wood	-	51.668

Distribution of volume/ha. by species and diameter classes in different utility are given in Table No. 2.3.1 to 2.6.0.

Contents

4.7 Total growing stock :-

Total volume (in '000 m^3) by species and diameter classes for the project area is given in the Table No. 3.1.1. Total volume (in '000 m^3) by the species and diameter classes as per their utility classes for important species are given in the Table No. 3.2.1 to 3.2.4. Total Growing Stock is 33776.433 (in '000 m^3).

A perusal of volume tables would indicate the following distribution in respect of important commercial species :-

Name of the species	Total volume in '000 m^3
Dipterocarpus species	3633.858
Amoora wallichii	173.554
Parisia insignis	451.962
Terminalia bialata	738.213
Terminalia procera	1159.221
Canarium euphyllum	589.728
Endospermum molaccensis	92.065
Anthocephalus cadamba	76.430
Salmalia insignis	282.907
Sideroxylon longepetiolatum	196.008
Pteroceymbium tinctorium	1562.875
Artocarpus chaplasha	1189.043
Artocarpus lakoocha	353.822
Hopea odorata	65.352
Pajanelia longifolia	383.358
Adenanthera pavonina	56.298
Planchonia andamanica	743.065
Diploknema butyracea	311.050
Lannea coromandelica	774.965
Lagerstroemia hypoleuca	527.475
Terminalia manii	320.818
Calophyllum inophyllum	0.198
Manilkara littoralis	69.969
Albizzia lebbek	248.982
Sageraea elliptica	91.573
Diospyros marmorata	281.544
Murraya paniculata	0.853
Podocarpus neriifolia	4.927
Pterocarpus dalbergioides	3858.471

The following table indicates the utility break-up of the total growing stock :-

Utility	Volume ('000 m^3)
Plywood	3312.886
Match wood	1846.031
Constructional wood	2648.144
Ornamental wood	2886.181
Non-commercial wood	4545.027

4.8 Error :

The error of the total growing stock over the project area is estimated to be 9.66%.

4.9 Distribution of Mangrove species :

The Mangrove forests or the Tidal swamp forests form a natural protection belt to the land mass from the hazards of soil erosion. It occupies a major portion of the edges of the tidal creeks namely Balmi creek, Parangara creek and Kalara creek. The aerial photographs of the mangrove forests exhibit the appearance of a smooth carpet with a medium grey to dark grey colour. Texture is smooth even for Rhizophora while it drastically changes in case of Bruguiera since it depicts a rough and uneven texture.

It is observed that Rhizophora species are abundant at the edge of the tidal creeks and remain hanging on the creek at the low tide. The belt extends from 1 m. to several metre on the land side. Above the Rhizophora species is the Bruguiera species characterised with an admixture with Rhizophora species. Breathing roots and stilt roots are typical for Rhizophora while stilt roots do not develop in case of Bruguiera.

It is observed from a study of the data that the average height in Rhizophora ranges between 7 m. to 8 m. while for Bruguiera it goes upto 10 m.

The distribution of stems/ha. for various mangrove species is as under :-

Mangrove species	Stems/ha.
Rhizophora candelaris	800.6
Bruguiera conjugata	427.1
Bruguiera parviflora	1.9
Avicennia officinalis	148.9
Heritiera littoralis	4.4
Miscellaneous	48.0

Thus it is evident that the abundance of Rhizophora species surpass Bruguiera in the areas.

Volume distribution for various mangrove species is as follows :-

Species	Volume (m^3/ha.)
Rhizophora candelaris	38.4
Bruguiera conjugata	68.3
Bruguiera parviflora	0.5
Avicennia offici-nalis	3.2
Heritiera littoralis	0.5
Miscellaneous	4.6

A perusal of the above table clearly indicates that the volume/ha. for Bruguiera species is more than that of Rhizophora (nearly 1.8 times). Further it is observed that nearly 60% of volume lies in the diameter range of (4-9 cm.) and thereafter falls gradually. Volume distribution after diameter class 50 cm. onwards is extremely poor.

Mangrove species is mainly used by the local population as fire wood for high caloric value. However, the crop is characterised by higher tanin content.

CHAPTER - V

MANAGEMENT OPPORTUNITIES & POTENTIAL ANNUAL CUT

5.1 Forest management :

Owing to inadequacy of transport and communication facilities and lack of infrastructural development, the management of North Andaman forests had so long been utilisation-oriented and fellings had been selective. Gradually with the improvement of Ports at Mayabunder and Cornwallies, development of roads intensified and consequently more areas were brought under management and felling. For better development of forests of this region, this particular division along with Little Andaman had been brought under Andaman & Nicobar Islands Forests and Plantation Development Corporation Ltd.

The forests are given the following treatments :-

i) Conversion of suitable areas to uniform crop with concentrated natural regeneration. Deciduous semi-evergreen and evergreen forests are to be regenerated as per Andaman Canopy Lifting with Sheltered Wood System.

ii) Selected areas of moist-deciduous forests would be converted into plantations of valuable species by clear felling.

iii) Conversion of Mangrove forests by clear felling.

In order to meet the objectives of management of forests, several Working Circles have been classified such as Conversion Working Circle, Protection Working Circle and Overlapping and M.F.P. Working Circle. A total area of 1592.58 ha. has been brought under natural regeneration. To arrive at the figure of area under high forests, the following areas were excluded namely -

i) Area under rehabilitation
ii) Area under plantation and natural regeneration
iii) Area under mangrove
iv) Area under Jarwa reserve
v) Area under Protection Working Circle.

This gives the net area of high forests as 158522 ha. But the Project Report prepared by the Andaman and Nicobar Forest & Plantation Development Corporation Limited for Logging, Marketing etc. on the Island stipulates productive area at 108261 ha. by elimination of unproductive forests, swamps, Revenue area etc. As such calculations have been based on this productive area.

Forests have good record of natural regeneration. In the process the economically important local species have established themselves. The plantation were restricted to 30% of the area and the balance 70% has been kept for initiating natural regeneration. In the Project Report of Andaman Forest Development Corp., it was emphasized that in North Andaman an area of 1445 ha. will be set up annually for exploitation. It has been intended that 1/3rd of the growing stock is to be taken out.

5.2 Exploitable girth :

Under the Andaman Canopy Lifting Sheltered Wood System, commercial species were earmarked to be removed first and thereafter non-commercial species. The following girth classes for different types of wood were prescribed.

Girth at Breast Height (in cm.)		Wood Class
120 cm.	-	Soft wood
150 cm.	-	Hard wood
180 cm.	-	For other species

In the second operation fellings, Brushwood cutting and girdling of undesirable species and poles of non-commercial species upto 10 m. height was intended to be felled. Moreover, trees of height between 10 to 20 m. were to be girdled. Un-healthy trees and trees having small hard wood were also to be felled.

5.3 Rotation and conversion period :

No definite information is available on the rotation (either Silvicultural or Financial) of the Commercial species of Andamans. From the meagre statistics given in Dean's and other Working Plans, and subsequently observations recorded by the Silvicultural Divisions, it appears that both Padauk and Gurjan, the two major species, would obtain an average girth of slightly more than 150 cms. in 100 years. If properly tended throughout the life, perhaps the trees may put on much faster girth increment. Further observations recorded by Changappa show that in case of Padauk, M.A.I. starts falling after an age of about 100 years. The above facts thus give an indication that the rotation is likely to be nor more than 100 years for Padauk, Gurjan and other hardwood commercial species of Andamans, with the assumption that the rate of growth of other hardwood species would be akin to that of Padauk and Gurjan.

In absence of definite information the same rotation has been adhered to considering their intimate mixture with the hardwood species.

5.4 Conversion period :

The conversion period should be as short as possible, provided the yield is properly regulated at the end of the conversion period. Since those natural forests are to be worked out for conversions for the first time, the present overmature trees in these forests have to be extracted in the earliest possible time to prevent loss of timber due to negative increment being put on by them. Further with the modern trends in utilisation aiming at production of cellulose than higher girth logs, it is considered essential to convert the entire area within a period of 75 years, which will be adopted as the conversion period for evergreen as well as deciduous forest areas, though generally the deciduous species are comparatively faster growing than the evergreen species. Moreover, the method of regeneration aims at taking advantage of the existing advance growth of pole crop, in adequate numbers. At the time of harvesting in the second rotation crop considerable number of trees will be more than 75 years old.

Since the softwoods and hardwoods grow in intimate mixture and the adoption of a different conversion period for soft woods is likely to create shortage of floaters while extracting hardwoods, it is proposed to adopt the same conversion period for the softwoods and hardwoods in the evergreen as well as deciduous forest areas. The position should be reviewed at the time of next revision of the Working Plan, when substantial data are expected to be available.

NORTH ANDAMAN

5.5 Annual yield :

Yield calculated by various area and volume control methods are as follows :-

(i) Area of Annual cut = $\frac{158522}{75}$ = 2113.626 ha.

But it is necessary to have a volume check to avoid overfelling and fluctuation in annual yield due to irregular stocking. The Static growing stock of mature or overmature trees will put on regular increament. While, younger girth class will put on increament to pass from lower to higher girth classes. Annual yield will be calculated as follows :-

(ii) Annual yield (By volume) = V/R (Modified Von-Mantal's)

V = Volume of growing stock

R = Rotation 100 years

= $\frac{33776433}{100}$ = 337764.33 m^3

From the above two calculations, it is obvious that the annual yield of 337764.33 m^3 is to be limited to the availability of timber within 2113.626 ha.

(iii) Adopting a felling cycle of 25 years and calculating volume of trees over explitable girth it was found by using the formula - Annual yield (Y) = $\frac{\text{Vol. of trees over exploitable girth}}{25}$

$$= \frac{14600352}{25} = 584014 \text{ m}^3$$

Annual yield according to this calculation surpasses the previous estimate. As growth data is inadequate, it is judicious to fix yield at 2113.626 ha.

Yield as per Project Report of Andaman & Nicobar Forest & Plantation Development Corporation Ltd. (taking 30% areas to be clearfelled & and 70% naturally regenerated).

(a) Yield from clear felling areas
Clearfelled areas = 30% of $\frac{158522}{100}$ = 47556.60 ha.

$$= \frac{47556.600}{100} = 475.566 \text{ ha}$$

Volume for clearfelled area = 101240.39 m^3

(b) Natural Regeneration Area (70% of the productive area)
110965.40 ha.

Area = $\frac{110965.40}{75}$

= 1479.538 ha.

Volume over exploitable girth = 92.103 m^3/ha.

∴ Yield = 136269.89 m^3.

(c) Total yield under the model works out as under :

Total yield = Yield from clearfelled area + Natural Regeneration area.

= 237500.280 m^3.

Since it has been intended in the Project Report prepared by Andaman & Nicobar Islands Forest & Plantation Development Corporation Ltd., 1976 at page 32, para 4.15 that one third of the growing stock will be taken out for exploitation and balance to be left behind. The present calculation takes notice of this and proposes annual availability of resources as below :-

(d) Yield = 1/3(Growing stock) (taking 2113.626 ha. only)
= 149985.72 m^3.

In case the Forest Department claims to work only 1445 ha. (Annual coupe) as in Project Report (Production forest taken as 1,08261 ha.), the yield will be as follows :-

(a) Yield from clearfelled area = 30% of 1445 ha.
= 433.50 ha.
= 433.50 x 212.884 m^3
= 92285.214 m^3 .....(A)

(b) Yield from Natural Regeneration area = 70% of 1445 ha.
= 1011.50 ha.

Yield = Area x Vol./ha. = 1011.50 x 92.103 m^3
= 93162.185 m^3 .....(B)

(c) Total yield = A + B = 185467.399 m^3

(d) As per the prescription - one third yield amounts 1/3 (Growing stock) (Taking 1445 ha. only)
= 102539.126 m^3

Thus on a detailed study of various models for yield estimation, it is observed that yield as per the prescription of Forest Development Corporation is on a conservative level. Keeping in view the management problem and silvicultural system of the areas it is judicious to accept the yield of 102539.126 m^3.

5.7 Yield from Mangrove Forests :

The Mangrove Forests in the Island is about 29254 ha. Assuming a rotation period of 30 years, the annual crop works out to be 97513 ha. $\left(\frac{29254}{30}\right)$ = 975.13 ha.

The total yield from the area is 115.109 x 975.13
= 112246.240 m^3.

Clearfelling with standards is the silvicultural system and about $\frac{1}{4}$ of the volume of Rhizophora and Bruguiera species are left as standard. Therefore, after retention of standard the available yield approximates to 84184.68 m^3.

5.8 Annual Yield (Utility Classwise) :

Estimated yield of timber which is likely to be made from the project area under the proposed working model is furnished below (Utility class-wise).

Estimated Annual Yield (m^3) - Utility classwise.

Utility Class	Total Yield (m^3)
Plywood	10058.161
Match wood	5603.227
Constructional wood	8031.790
Ornamental wood	8766.813
Non-commercial wood	13798.784
Residual wood	31442.232
Small wood	24838.119
T OTAL :	102539.126

CHAPTER - VI

LOGGING AND ACCESSIBILITY STUDY

6.1 In Perspective

The present study, in its limited scope, attempts to reflect the logging practice in the area with possible proposition of modern logging technique. It is, felt that mechanisation at all levels would be imperative necessity to maintain the economics of extraction at an optimum level.

Extensive data collected by the field parties were analysed by Dr. A. Berry, Transport Economist at Headquarters. The figures quoted in the chapter pertains to Dr. Berry's report viz. "Logging Report on Pulpwood extraction from Andaman Islands for Kakinada Project".

6.1.1 Logging operation : The present trend and the proposed plan :

Logging operation in North Andaman is still in its primitive stage. The operations for timber extraction can be broadly classified into the following sub-operation :-

1. Felling and Dilimbing.
2. Bucking.
3. Debarking.
4. Minor or off road transport
5. Major or on road transport.
6. Miscellaneous.

Felling is normally done by felling axe and hand saws or both combined. Trees are felled above buttress resulting in a huge wastage of timber (about 1.5 m.-3 m.). There are some buttressed trees in North Andaman which is appended in No. 6.1.1. As a result of such buttressed trees, there is a shortage of 10.3% in volume of the timber.

Buttress forming species in Andaman

		Local name	Average volume in m^3/ha.
1.	Pterocarpus dalbergioides	(Padauk)	12.09
2.	Salmalia insignis	(Didu)	2.43
3.	Sideroxylon longipetiolatum	(Lambapatti)	0.89
4.	Manilkara littorilis	(Sea Mahwa)	0.74
5.	Duabanga sonneritioides	(Duabanga)	0.45
6.	Tetrameles nudiflora	(Thitpok)	3.52
7.	Pterygota alata	(Lithok)	0.21
8.	Pometia pinnata	(Tithkandu)	5.98
	Total of Buttressed species :		26.31
	Total of the area		254,981.

Note: 1. Volume of buttressed trees is 10.32% of total volume of the area.

2. Definition of buttressed trees is based on F.A.C.1978.

A feller is usually paid Rs. 14/- per day (including fringe benefits) and fells about 600 cms. girth per man per day.

Power chain saws have been recently introduced. It is anticipitated that it would take sometime to become popular. With the use of power saw, more usable volume per unit area will be available. To speed up the adoption of power saw, proper training will have to be imparted to the workers.

It is proposed that use of axe be discouraged immediately. Two men cross cut saw preferably with raker tooth be used for felling. Delimbing is also, done by axe at site.

The normal out put and cost of felling and limbing operations are as under :-

5 m^3 hard woods/day/worker i.e.
Rs. 2.80 per m^3.

7 m^3 soft wood/day/worker i.e.
Rs. 2.00 per m^3.

The average labour cost will be Rs. 2.40/m^3. Besides this manual cost, the cost of tools etc. should be added and so the total cost will be around Rs. 3.00 per m^3.

The above rates are applicable for large sized trees only. In Pulpwood operation small sized trees will also be felled. It is assumed that their cost will be 50% higher i.e. felling and delimbing cost will be about Rs. 4.50 per m^3.

Bucking :

It is done mostly at the stump. Two men cross cut saw is used to cut the trunks into logs. The saw used is of fixed handle neg tooth type. Iron wedge and 5 kg. hammer are also used to free the jammed saw, if necessary. The cost of one saw is Rs. 156 F.O.B. Port Blair (1980).

The sawyers are paid Rs. 14.00 each. Normally 2 workers cut 620 cms. girth per day of hard woods and 700 cms. of soft woods or about 18 cuts/day. On an average their performance may be taken as 7 m^3 to 14 m^3 per day i.e. about Rs. 2.80 per m^3. Besides, the recurring cost should be taken into account. Thus the total cost will be around Rs. 3.50 per m^3.

For small sized pulpwood operation this cost is expected to be 25% higher i.e. about Rs. 5.50 per m^3.

In course of time this cost of operation would be done by "raker tooth cross cut saw" for large sized timber end " Bow saws with raked tooth" for small sized wood.

Proper training in this regard is emphasized.

Scaling :

It is felt necessary to have scaling of the logs before conversion. For hardwood, the logs must have a minimum mid-girth of 120 cms. (u.b.) and its minimum length should be 3 metre. But in case of soft wood, the logs must have 100 cms. mid-girth (u.b.) with workable length.

A minimum " bark allowance" of 7 cm. in diameter measurements may be permitted for all species.

Debarking

Logs are normally not debarked. Most of the bark peels off due to successive handling of wood at various points. It is estimated that one worker earns @ Rs. 14/- per day and will be able to peel at least 10 m^3 of wood i.e. debarking will cost Rs. 1-40 per m^3. Thus if the cost of tools etc. be added then the total debarking cost will be about Rs. 1.70 or say Rs. 2.00 per m^3.

Minor transport :

The wood can be brought out from stump to the road side landing by any of the following methods :-

1. Framed steered wheeled type skidder
2. Crawler tractor
3. Forwarder
4. Agricultural tractor with winch
5. Rope ways
6. Tram line
7. Elephant dragging
8. Horse/mule dragging
9. Buffalo dragging

The use of Agricultural tractor with trolley may be tried on feeder roads for pulpwood extraction.

Skidding :

The system of its use and its various cost inputs are not satisfactory at the present level. To improve the 'Skidders' Tractor in rain on clayey and clayey loam soils, steel tracks or chains should be used on wheels.

Its cost at the present pattern works out to Rs. 25.43 per m^3/km. lead. Skidding trails are made @ Rs. 5000/- to Rs. 10,000/- per km. to facilitate skidder movement. Thus the total cost works out Rs. 28.99 per m^3/km. lead . In the present use pattern and in the proposed use pattern it may cost Rs.18.57 per m^3/km. Hence, the average skidding cost will be about Rs. 28.78 per m^3/km.

Crawler :

The details of cost involved in its use could not be obtained as the machine has not yet been put to use in the region. However, the final cost approximates to Rs. 73.52 per m^3/km. dragging distance though it can be reduced upto Rs. 39.01 per m^3/ km.

Elephants :

Elephants are normally used for skidding and loading/ unloading. It is put to full work when it is 18 years old, though some light work is taken since 9 years of age. It is used upto 60 years of age and then left loose. The normal dragging norm is is as under for 800 m. distance :-

Class. A	(Male) Elephant	-	8 m^3/day
" B	(Female) "	-	5 m^3/day
" C	(Calf) "	-	2 m^3/day

An elephant works mostly in cool forenoon hours. They are left looses in the forest in the afternoon and brought back next day morning. This practice disturbs the schedule working hours and as such it should be discouraged. Stall feeding should be encouraged for fuller use of them.

As per the present use pattern, it costs Rs. 65.68 per m^3 to drag one km. by an elephant. If the use pattern is changed then it is expected that the cost may come down to Rs. 37.81 per m^3 for skidding 1 km. distance. On an average the elephant dragging cost may be taken as Rs. 51.75/m^3/km.

Tram line :

It is not exactly an "Offroad" transport method, but it is an intermediate transport method.

It carries 16 - 25 logs per trip and normally makes 1 trip/day. It takes 4 trolly loads only.

There is scope to improve the efficiency of tram line for the present use pattern when only one trip per day is made and 18 m^3 is hauled per day- the timber extraction cost per m^3 per km. of load is ~~the~~ Rs. 58.87. This cost can be brought down to Rs. 12.25.

Cable ways :

There are many types of cable ways right from simple Donald, Gravity rope way, high lead yarding, Pendulum cable, Monocable to radio operated cable crane.

Areas with slope class (36-58%) may be logged by these methods. For down hill transport of small volume (upto 0.3 m^3 per load). Donalds gravity rope way or Round Monocable may be used for down hill transport of smaller load. For up hill transport of 300 m. driving distance high lead yarding may be tried.

Buffalo dragging :

The average capacity of Buffalo dragging varies from 2.5 to 3 m^3/day for a dragging distance of 0.5 km. A pair of buffalo costs Rs. 1500/-. It can work for 10-12 years and one man can handle it. The maintenance cost of such animals is almost free as there is no grazing fees in the Andaman forests.

The approximate cost of dragging will be Rs. 5.69/m^3 for a distance of 0.5 km. considering the use pattern and local wage rate.

Major transport :

The modes of major transport are as under :-

1. Truck
2. Floating
3. Feeder path

There are no railways in the region.

Truck transport :

7 tonnes fixed body platform type trucks are used for transport of logs from landing to Jetties. Loading at landing is done either by elephants (10-30 minutes time) or manually (30-60 minutes for a gang of 10 men). The unloading time is 10 minutes for elephants and 30 minutes for manual workers. Now use of 10 tonnes truck is becomming popular.

Its cost per effective work hour is Rs. 65.67 to Rs. 210.00 per day. Cost calculations of the truck is as under:-

1. Capital cost ... Rs. 1.5 lakh
2. Annual depreciation = $A = (P-S)\ crf_{i-n} + Si$

   When P = 15,00,00/-
   S = 10% of P = 15,000/-
   crf = 0.22285 at i = 15% & n = 8 years
   A = 32,335/-

   For 280 days/year and 7 effective hours/day depreciation component will be Rs. 16.5/hours.
3. Fuel consumption (FAO 1974)
   0.14 x 130 x 1.5 = Rs.27.3/hour running
4. Oil & lubricants (FAO 1974)
   $\frac{150000 \times .005}{1000}$ = Rs. 0.75/hour running
5. Repair & maintenance cost
   $\frac{150000 \times .1}{1000}$ = Rs. 15/hour running
6. Operation cost
   @ Rs. 600/- p.m. for a driver and Rs. 400/- p.m. for a cleaner
   i.e. Rs. 12,000/- per year or Rs. 6.12/hour

7. So total cost is Rs. 65.67 per running hours.

8. The cost/day will be 7 (16.5 + 6.12) + 3.5(27.3 + 0.75 + 15)
= say Rs. 210/- per day.

When one day is 7 hours working time but 3.5 hours running time, under local conditions.

These calculations are done as it is presumed that normally the actual working hours/day will be 7, though actual on-way time (running time) be 3½ hours and balance 3½ hours will be terminal time. By reducing the terminal times (quicker loading and unloading) the economics of truck transport can be improved.

If it does 3 trips per day of 20 km. one way, then it ~~transport~~ transports 15 m^3/day for 120 kms. Thus transport cost becomes Rs. 0.12/m^3/km. driving distance or Rs. 0.25/m^3/kms. of lead. Thr hired trucks charge Rs. 0.50 to Rs. 1.00 per m^3/km. So, the average truck transport cost may be taken as Rs. 0.60/m^3/km.

The efficiency of truck transport may be increased by reducing terminal timings.

Floating :

Logs are brought by trucks upto the Jetty and then floated down the creek in the form of rafts. A raft normally has 5 to 8 logs.

For 5 logs normally it takes 3 floaters and 2 sinkers. Rafts are made by lying logs with split canes. The total cost of making of raft is about Rs. 6.80/-rft. or Rs.1.70 per m^3 ir say Rs. 2.00/m^3. Rafts are brought to export point by driving with poles by the raft drivers. Raft speed is about 5 km./day. At times motor boats are also used for towing of rafts.

To save the logs from sinking and insect attack, they are turned at storage site to get re-rafted. Hard woods are not re-rafted. The turning and re-rafting cost is Rs.0.87/m^3.

As an alternative; 'BARGES' may be considered. Log dug out channels may be tried for transport on marshy areas.

6.3. Feeder paths :

Construction of motorable kachha roads for use as feeder roads cost Rs. 10 to 50 thousand. They last for 3-4 years without maintainance. The area being in a high rainfall region, the life of kachha road is limited. The life can be improved if it is made black-topped.

Loading and unloading :

The loading and unloading operations can be exercised by various ways. It may be done by Elephants, Manual labour or by crane loaders.

The probable cost of various loadings are given below :-

(a) Elephant loading - Rs. 10.20 /m^3.

(b) Manual loading -(10 men) - @ Rs. 14/- per day of one Truck of 5 m^3 capacity in 30-60 minutes of effective working hours is taken as 5 hours/day, they can load 6/7 trucks/day i.e. 30 to 35 cm^3/day. Therefore, the loading cost is Rs. 1.29/m^3.

loading cost for small sized pulp wood is estimated as Rs. 7/- per m^3.

Transport and probable cost :

The major transport operation can be divided into 3 modes under the present circumstances.

1. Truck transport.
2. Creek transport.
3. Sea transport.

Tram line will usually help as a feeding mode for the truck transport. For creek and sea transport, various alternatives yet to be sorted out. It is almost agreed upon that the creek transport will be done in barges.

Truck transport :

It is estimated that a truck may transport about 4000 m^3/ year.

Cost:

Taking into consideration that the average road distance may be 36 km. and creek driving distance as 8 km., the truck transport cost will be about Rs. 22.00 per m^3. The efficiency of the truck can be increased by reducing terminal timings. The cost of manual loading and unloading is estimated to be Rs.7.10/m^3

Barges :

The creek transport only may be solved by Barges; specially when small sized wood is to be handled. Making rafts of smaller sized wood will be difficult and costly. The species having different degree of floatability will not be a problem by transporting timber in Berges, besides saving the wood from insect attack. Berges are loaded of creek-heads either by (i) Manual (ii) Simple machines (iii) Elephant (iv) Winches. It is presumed that the Berge loading will be about 3 times costlier than the truck loading cost (Rs.5.00/m^3) i.e. it will cost Rs. 15/- per m^3.

Minor transport :

The finally cut timber and debarked volume will be transported out from the site of felling either by skidder, elephant, head load or by other methods or their combinations depending upon the terrain.

Taking intox consideration of initial investment of various transport machinaries, animals and the maintenance cost thereof, the approximate cost of extraction under various mode of transport may be summarised as below :-

Mode of transport	Cost of extraction Rs./m^3/km.	Weighted average cost of extraction (Rs./m^3/km.)
Skidder	23.78	
Crawler	73.52	
Buffalo	22.78	31.73
Elephant	51.75	
Gravity Rope-way	33.34	

The cost of extraction of small wood will be higher by 25%. Thus the off-road transport cost will be Rs. 39.69 or say Rs. 40/m^3/km., the average lead being taken as 1 km.

Ports and Jetties :

Jetties are innumerable. Some of them are under the control of Forest Department and other with Harbour authorities. The prominent Jetties in the North Andaman are Diglipur and Mayabunder Jetty.

Season of extraction :

The North Andaman area receives heavy rainfall during the period from May to September/October. Hence the extraction of timber is very much restricted even in inland during that period. It is almost stopped from the middle of May till the drier period comes from Sept./October. The extraction of timber starts again including further transportation to mainland from Sept./October as the sea becomes navigable. It has been observed that no extraction is fessible during the rainy season except some turning over of the stocked timber in the inland depots by the Departmental Elephants. This is done to protect the timber from the insect attack and damages during that rainy season.

Accessibility studies :

The present project area is below the altitude of 500 metres and has gentle slope ($<$36%). About 38% of the areas have obstacles more than 5 metres apart; about another 40% have obstacles between 3-5 metres apart and the balance area of about 22% is situated on rocks.

The following table gives an abstract of the terrain classification :-

A) Area into Altitudinal classes:

Sl.No.	Altitude	No. of plots	Percentage
1.	Below 500 m.	323	100%
2.	Above 500 m.	-	-
	Total	323	100%

B) Area into slope classes :-

Sl.No.	Slope	No. of plots	Percentage
1.	36%	274	84.83
2.	36-58%	41	12.69
3.	58-100%	8	2.48
4.	100%	-	-
	Total	323	100.00

C) Area into Ground Roughness(obstacle) class :

Sl.No.	Average dist. between obstacle.	No. of plots	Percentage
1.	5 m.(min. 3 m.)	25	7.74
2.	5 m.(min. 3 m.)	99	30.65
3.	3 m. - 5 m.	133	41.18
4.	3 m.	46	14.24
5.	Ground with boulder and screes	14	4.33
6.	Ground with precipitous and chiffs-	6	1.86

D) Area into accessibility classes :

Sl.No.	Distance	No. of plots	Percentage
1.	Road within 1000 m.	49	15.17
2.	" " 1001-3000	72	22.29
3.	" " 3001-5000	202	62.54
4.	" " 5001 +	-	-
	TOTAL	323	100.00

The following table shows the classification of the area into obstacle classes within slope classes :-

Slope	Ground roughness Obstacles	North Andaman in % over the whole island	within slope class
0° - 20°	> 5 m.	36.22	42.69
< 36 %	2 - 5 m.	33.44	39.42
	< 3 m.	10.53	12.41
	Very gough	4.65	5.48
	Total	84.84	100
21° - 30°	> 5m.	2.16	17.02
	3 - 5 m.	6.19	48.78
36% - 58%	< 3 m.	3.41	26.87
	Very rough	0.93	7.33
	Total	12.69	100
31° - 45°	> 5 m.	0	0
	3 - 5 m.	1.55	62.5
58%-100%	< 3 m.	0.31	12.5
	Very rough	0.62	25.0
	Total	2.48	100

Thus on the basis of slope alone it can be concluded that the areas with slope less than 36% i.e. about 84.8% of the total area are suitable for vehiclar machines such as Tractors, Frame Steered Skidders, Crawlers etc.

Each slope can be further classified on the basis of obstacle classes, the soil stickyness classes and into slope obstacles - soil stickyness classes for better off road transport method.

Taking into accounts slope and obstacles together in slope 36% the planning for use of Agricultural Tractors with wrench or use of buffalo or elephant or a skidder may be planned.

Classification area into soil stickyness class :-

Slope	Soil stickyness	North Andaman (in %) Over the whole island	Within slope class
	Non-sticky	1.55	1.83
	Slightly sticky	41.49	48.92
36%	Sticky	27.24	32.12
	Very sticky	14.54	17.13
	Total	84.82	100

Slope	Soil stickyness	North Andaman (in %) Over the whole Island	Within slope class
36%-58%	Non-sticky	0	0
	Slightly sticky	6.19	48.74
	Sticky	4.03	31.73
	Very sticky	2.48	19.53
	Total	12.7	100
58%-100%	Non-sticky	0	0
	Slightly sticky	2.48	100
	Sticky	0	0
	Very sticky	0	0
	Total	2.48	100

The above table shows that in slope class $<$36% (14.54) area has very sticky soils. This may pose a problem for skidders and tractors. Thus tyre tracks and chains must be used for the area. The possibility of use of combination of crawlers and skidders may be examined, former for short distance terrain transport and later for comparatively longer extraction to main landings.

Slope 36% - 58% :

In the region extraction may be done either by cable ways or by making skidder paths and bringing out materials by elephants upto it.

Slope class $>$58% :

In the present tract dealt with, the area falling under this class is minimum. This region may not be extracted due to the possibility of soil erosion and environmental imbalance.

An abstract of the terrain classification of North Andaman into slope, obstacles and soil stickyness classes (expressed in percentage) is appended as below :-

Slope	Obstacles	Soil stickyness	North Andamans Plots	% over the whole island	% within slope class
1	2	3	4	5	6
$<$36%	$>$ 5 m.	Non-sticky	5	1.55	1.82
		Slightly sticky	48	14.86	17.52
		Sticky	41	12.69	14.96
		Very sticky	23	7.12	8.39

1	2	3	4	5	6
36%	3 - 5 m.	Non-sticky	0	0	0
		Slightly sticky	69	21.36	25.18
		Sticky	31	9.60	11.31
		Very sticky	8	2.48	2.92
	< 3 m	Non-sticky	0	0	0
		Slightly sticky	13	4.02	4.74
		Sticky	13	4.02	4.74
		Very sticky	8	2.48	2.92
	Very rough	Non-sticky	0	0	0
		Slightly sticky	4	1.24	1.46
		Sticky	3	0.93	1.09
		Very sticky	8	0.48	2.92
	Sub-total	Non-sticky	5	1.55	1.82
		Slightly sticky	134	41.49	48.91
		Sticky	88	27.24	32.12
		Very sticky	47	14.55	17.15
	Total	-	274	84.83	100.00
	> 5 m	Non-sticky	0	0	0
		Slightly sticky	5	1.55	12.20
		Sticky	2	0.62	4.88
		Very sticky	0	0	0
36%-58%	3 - 5 m	Non-sticky	0	0	0
		Slightly sticky	12	3.72	29.27
		Sticky	4	1.24	9.76
		Very sticky	4	1.24	9.76
	< 3 m	Non-sticky	0	0	0
		Slightly sticky	3	0.93	7.32
		Sticky	5	1.55	12.20
		Very sticky	3	0.93	7.32
	Very rough	Non-sticky	0	0	0
		Slightly sticky	0	0	0
		Sticky	2	0.62	4.88
		Very sticky	1	0.31	2.44
	Sub-total	Non-sticky	0	0	0
		Slightly sticky	20	6.19	48.78
		Sticky	13	4.02	31.71
		Very sticky	8	2.48	19.51
	Total	-	41	12.69	100

1	2	3	4	5	6
	> 5 m	Non-sticky	0	0	0
		Slightly sticky	0	0	0
		Sticky	0	0	0
		Very sticky	0	Ø	0
	3 - 5 m	Non-sticky	0	0	0
		Slightly sticky	5	1.55	62.5
		Sticky	0	0	0
		Very sticky	0	0	0
58%-100%	< 3 m	Non-sticky	0	0	0
		Slightly sticky	1	0.31	12.5
		Sticky	0	0	0
		Very sticky	0	0	0
	Very rough	Non-sticky	0	0	0
		Slightly sticky	2	0.62	25
		Sticky	0	0	0
		Very sticky	0	0	0
	Sub-total	Non-sticky	0	0	0
		Slightly sticky	8	2.48	100.00
		Sticky	0	0	0
		Very sticky	0	0	0
T O T A L		-	8	2.48	100

Roads :

Most of the roads in Andamans are constructed by Public Works Department. They are engaged with construction of 'Trunk Roads' or rural roads.

Upto the Fifth Five Years Plan (1974-78) the total length of rural roads were 260 kms. In the Sixth Five Years Plan another 80 kms. road is proposed. Thus the total length of 'Rural Road' will be 340 kms.

In all 343 kms. of 'Trunk Road' is to be made connecting South Andaman, Baratang Island, Middle Andaman and North Andaman and out of this 89 kms. is proposed for North Andamans. The details are as below :-

I s l a n d	Proposed road (in km.)	Already made (in km.)
South Andaman	110	87
Baratanga	22	20
Middle Andaman	122	120
North Andaman	89	11
T O T A L	343	238

It is assumed that all the proposed trunk and rural roads will be made within Sixth Five Years Plan.

Road Planning :

Major portion of North Andaman falls in the slope class $<$ 36%. If it assumed that the average skidding distance is 1 km. then the road density becomes 5.0/ha. Thus based on the above figure the total road length needed for whole of Andaman is 1414.21 kms. and for North Andaman it is 792.61 kms.

It may be noted that the region has 588.1 kms. and North Andaman has about 116.9 kms. of creek ways. Out of these creek way about 10.7 kms. in North Andaman has steamer service and the balance of 106.2 kms. can be used for floating. If floating is discouraged the above calculation holds good.

Cost of construction :

Owing to irregular and undulating configuration of the ground, the cost of roads and bridges varies from place to place to a great extent. However, rates of construction of various types of roads and bridges have been collected from various organizations and Departments, linked with the construction works.

The average costs are as under :-

Construction and maintenance cost of roads :

Cost of construction	Cost of maintenance
1. G.A.T.Road Rs. 5 to 8 lakhs/km.	Rs. 2.5 lakhs/km.
2. Feeder Road Rs. 3 lakhs/km.	Rs. 1.5 lakhs/km.
3. Forest service roads Rs.3.5 lakhs/km.	Rs. 3,000/km.
4. Forest Feeder Roads Rs.1.25 lakhs/km.	Rs. 2,000/km.

Construction cost of bridges and culverts :

Cost of construction	Cost of maintenance
1. 30 m. x 6.8 m. R.C.C.Bridge	Rs. 8 lakhs in total
2. 3.5 m. single pipe	Rs. 10,000
3. 8.5 m. double pipe	Rs. 20,000
4. 30 m. x 6.8 m. wooden bridge	Rs. 2 lakhs in total

~~6.3.3~~ 6.4 Shipping :

The existing two jetties (at Cornwallis and Mayabundar) are the main media for linking this territory with the rest of India.

The specifications of the existing jetties area as under.

Name of the Jetties	Location-length breadth	Water at lowest tide.	Depth of the ships that can be accomodated.
Port Cornwallis	Aerial Bay-36 m.- 10 m.	5.50 m.	4.5 m. Draft ship
Mayabunder	Mayabunder-48 m - 12 m.	9.50 m.	7.0 m. Draft ship

~~6.3.4~~ 6.5 Cost of wood transport to main land :

The details regarding timber transport and its handling in respect of both logs and sawn timber are as follows :-

L o g s	Per cu.m. (m^3)
Freight charges from Andaman to Calcutta	Rs. 110.35
Surcharge from Andaman to Calcutta	Rs. 43.55
Handling charges at Calcutta	Rs. 84.00
Depot Estt. charges	Rs. 67.00
T O T A L :	Rs. 304.90

S a w n t i m b e r	Per cu.m. (m^3)
Transportation charges from Chatham to Haddo	Rs. 20.05
Freight charges from Andamans to Calcutta	Rs. 73.70
Surcharge	Rs. 43.55
Handling charges at Calcutta	Rs. 78.00
Depot Estt. charges	Rs. 67.00
T O T A L :	Rs.282.30

Note:- Private ships charge 310 - 400 Rs./m^3.

Source:- Timber Depot Officer, Calcutta.

~~6.3.5~~ 6.6 Air Service :

The Islands are connected with the mainland by twice a week air service from Calcutta. Twice a week service to Madras is going to be started.

~~6.3.6~~ 6.7 Creeks :

The tract has a number of creeks and few rivers. A regular ferry service runs in some of the creeks. Their length is 68.1 kms. other creeks though shallow and narrow but may be utilised for timber floating.

The details in respect of creeks and rivers are appended as below :-

Sl.No.	Name of creek/river	Length of main creek in kms.	Length of subsidiary creek in kms.
1.	Terapa river	8.750	6.000
2.	Thoroughfar creek	3.250	7.250
3.	Gibb creek	5.125	-
4.	Paichtar river	4.500	5.125
5.	Teel creek	3.250	18.500
6.	-	-	2.375
7.	Daina nala	5.250	-
8.	Kalara creek	5.250	4.125
9.	Balmi creek	6.500	2.875
10.	Parangara creek	5.500	0.675
11.	-	4.250	8.225
12.	Jagannathdera nala	3.250	0.750
13.	-	-	5.275
14.	Radhanagar nala	-	0.875
	Total :	54.875	62.050

CHAPTER - VII.

INDUSTRIAL POTENTIAL AND WOOD BALANCE

7.1. Existing Industries and Markets:

There is no wood based industry in North Andaman. Most of the industries have been grown up in South and Middle Andaman.

The detailed list of wood based industries in Andaman Islands is appended as below:-

Sl. No.	Name of the industry	Initial installed capacity in m^3(approx.)	Average annual consumption in m^3(approx.)
1.	Govt. Saw Mill, Chatham	35,000	80 m^3/day=23600m^3/year
2.	M/S WIMCO Ltd.	10,000	1,26,000 million splints
3.	M/S Andaman Timber Industries.	13,400	3 million sq.m/annum on 4 mm. basis(12000m^3)
4.	M/S Silver Jubilee Multi-purpose Saw Mills.	-	8 m^3/day=800 m^3/year
5.	M/S Kamakshi Furniture Saw Mill Works.	-	850 m^3/year
6.	M/S Raj Kumar Saw Mill	-	50,000 m^3/annum
7.	M/S Darilal Saw Mill	1,500	1,200 m^3/annum
8.	M/S Darilal Industries	-	800 m^3/year.
9.	M/S Vanapana Pencil Wood Industries.	-	150 m^3/month
10.	Andaman Wood products Saw Mill	3,009	1,000 m^3/year
11.	Shri Muri Lal's Saw Mill	1,500	800 m^3/year
12.	M/S Jayashree Timber Products	16,800 m^3	250 m^3/month Saw mill 4 million sq./annum ply.
13.	M/S Asian Wood & Polymore(P) Ltd.	16,800	6,500 m^3/year
14.	Govt. Saw Mill, Bitapur	4,500	5 m^3/day=1475m^3/year
15.	Andaman Harbour Works Saw Mill, Little Andaman.	3,000	2,000 m^3/year

Besides, the following timber industries have come up in Andaman and Nicobar Islands in recent past.

1. Cooperative Saw Mills, Billiground, Middle Andaman.
2. Hatbour Saw Mills, Port Blair.
3. Raj Shipping and Timber Industries, Dundus Point, Port Blair.
4. Elephant Saw Mills, Great Nicobar.

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The above industries consume more than 1,00,000 m^3 per annum and are fully dependent on Andaman timber. The local people collect firewood from the lops and tops of commercial and non-commercial trees, rotten logs, fallen trees and also from mangrove forests. The demand of local population for timber is very negligible. But due to increase in population and constructional works the use of timber is in the increasing trend. In comparison to the bulk produce available, the local demand is very insignificant and consequently the major market for timber will continue to be in the mainland. The wood based industries of Calcutta and Madras have a great demand for Andaman timbers for the size and shape of the logs. WIMCO is at present the main purchaser of match logs for their existing units in Calcutta and Madras. The study report of GATT - International Trade Centre and Marketing Research Corporation Of India Ltd. regarding world market trends in Timber and timber products reveal that there is considerable scope for export of sawn timber, woodpannel products and also timber in round form.

7.2. Demand and Supply:

The Andaman and Nicobar Islands, Calcutta, Madras and Visakhapatnam constitute the principal demand zones of the tract dealt with. 19(Nineteen) wood based industries with total installed capacity 1,60,000 m^3(approx.) per annum are functioning in Andaman & Nicobar Islands and these factories are fully dependent on local timbers. Besides, the Railways, Public Works Department and WIMCO are the main purchasers of Andaman timber. The excess is exported to various agencies and industries in the mainland.

The transportation of logs from Island to mainland remained a problem so long. Big loaders were not easily available and was only occassionally allotted by the Shipping Corporation Of India. A considerable progress has been made in this respect of communication and transportation in the last decades but the problem yet remains acute.

Several ports and berths have already been constructed in Andaman which are able to accommodate the bigger ships like M.V. Diglipur of about 5,000 dwt. capacity. The Shipping Corporation Of India has acquired M.V.Diglipur with a view to transport the logs from Andaman to mainland. At present the big ships like M.V.Diglipur and M.V.Shompen are being used for transportation of timber.

Besides the timber wood, the Forest Department supplies the following forest produce to various agencies and industries in and outside the Andaman Islands:-

Forested Produce	Quantity supplied per annum
1. Sawn timber	10,000 m^3
2. Charcoal	42,000 kgs.
3. Resin	2,68,966 kgs.
4. Canes	7,64,925 Nos.
5. Bamboos	16,63,522 Nos.
6. Firewood	40,940 m^3

Shipment of timber by the Forest Department during the period from 1973 to 1978 is appended below:-

Year	Logs in m^3	Sawn timber in m^3	Total in m^3
1973-74	21852	5874	27725
1974-75	21415	6569	27984
1975-76	24938	4844	29782
1976-77	35927	3558	39485
1977-78	31042	1662	32704

The demand of Andaman timbers by the Indian Railways is enumerated below:-

Sl. No.	Name of the species	Quantity required annually(in m^3)
1	Gurjan	10,000
2	Badam, White and Black Chuglam	3,000
3.	Padauk,	2,000
	Total:	15,000

Calcutta market requires about 55,000 m^3 of Andaman timbers per annum for various wood based industries installed in Calcutta. Calcutta is one of the main plywood production centre in India. There a are about 34 plywood factories with installed capacity of production 11,945,000 m^2 of plywood(4 mm. thickness) per annum. The plywood and other wood based industries of Calcutta are mainly dependent on Andaman timbers.

There is a great demand of matchwood timbers in India. India requires 4.0 lakh m^3 of matchwood timbers per annum. Out of which WIMCO alone requires 1,43,000 m^3 for its units installed in different parts of India.

The National Commission on Agriculture has projected the following demand in India:-

Forest Product	Projected demand in '000 m^3/annum	
	1980	1990
Sawn logs	12,649	17,010
Wood required for panel boards	943	1,408
Pulpwood	2,129	12,733
Log wood	6,927	9,595
Total:	22,648	40,746

As there is no wood based industry in the area, the local demand is very insignificant. Hence almost the entire forest produce harvested from North Andaman is supplied to the existing industries either in Andaman and Nicobar Island or in the mainland.

Inter Island supplies are made through rafts, Sea going vessels and barges. The Forest Department uses their own vessels for transportation of logs within the Islands. Transportation of logs between the Islands and the mainland are maintained by the Shipping Corporation Of India Ltd.

7.3. Consumption pattern:

The main requirement of the population in the project area in respect of wood is for fire wood, construction of new houses and also renovation and repairing of old houses.

The area is not so thickly populated as compared to South and Middle Andamans. The population in the area is 35795 and the number of households is 7477. It is estimated that about 5446 families inhabit the area.

Based on the available data it is assumed that about 4% of the total houses are constructed in the project area every year. A wooden house is supposed to have a life of 25 years and accordingly the number of houses constructed annually are about 300. Taking the requirement of wood for new construction per house to be 23.5 m^3 and for repairing and renovation to be 0.3 m^3, the timber required for constructional purposes works out to be as below:-

$$300 \times 23.5 + (7477 \times 0.3)$$
$$= 9293.10 \ m^3/year.$$

Besides, the requirement of timber for agricultural implements and construction of country Boat is to the tune of 0.27 m^3/family/year. Thus the total requirement of timber for Agricultural implements approximates to (5446 x .27) m^3 = 1470.4 m^3.

The annual requirement of firewood in the project area is about 18.69 m^3 per family. Thus the total requirement of timber in the form of firewood is about 101785.74 m^3/year.

7.4. Pulpwood Availability:

During the year 1979-80 a study on the availability of Pulp wood was undertaken in connection with exploration of the possibilities of establishment of Paper and Pulp Mill under FAO/G.O.I. & T.C.P/I IND/0004(I). Regarding feasibility of utilisation of Andaman hardwood for manufacture of Pulp and Paper at Kakinada, Andhra Pradesh, the total availability of pulpable wood was estimated.

The pulp wood was defined as available wood from non-commercial species together with the available residual and small wood of commercial species.

Estimated outturn of pulpwood(Based on 20% samples) as obtained in the study is appended below:-

Division	Vol.(m^3)/ha.	Total volume(m^3)
North Andaman	202.836	321540

No separate study has been made in respect of pulpwood in the project area. The total outturn of pulpwood may be less than 321540 m^3. (As per the Interim Report based on 30% sample of the area). The Inventory Report of the entire project area shows per hectare outturn of total timber as 212.884 m^3.

7.5. Wood Balance:

The available timber volume should be reduced by the local consumption, industrial and other commitments to arrive at the available wood for new industries that may be recommended.

Utility	Annual yield(m^3)	Local demand(m^3)	Available for new industries(m^3)
Plywood	10058.161	-	10058.161
Matchwood	5603.227	-	5603.127
Constructional wood	8031.790	10763.500	(-) 2731.71 *
Ornamental wood	8766.813	-	8766.813
Non-commercial wood	13798.784	-	13798.784
Residual wood	31442.232	-	31442.232
Small wood	24838.119	101785.740	(-)76947.621 **
Total:	102539.126	-	-
Mangrove	84184.68	-	-

** The deficit of 76947.621m^3 of firewood is made up from 84184.68 m^3 of Mangrove fuelwood available in the Project area.

* The deficit of 2731.71 m^3 of Constructional wood is made up from 13798.784 m^3 of Non-commercial wood specially in the manufacture of Agricultural implements.

RECOMMENDATIONS

The inventory results of the forest resources and the existing market demand reflects a rosy potentiality for future wood based industries in the area. The net surpluses available under various categories of utility give a positive indication for industrial development of the area. But the industrial prospects of the project area faced with multiple problem. The remoteness and paucity of transport and communication have stood in the way of substantial exploitation and economic development of the Islands. As such, various facets of the problem should be studied in sufficient depth before an industrial venture is contemplated in the area. Some of the major hazards for industrial development are as below :-

Infrastructural Picture :-

Till 1979 only 49 km. of Tar roads and 21 km. of Kachha roads have been developed in the area. The existing condition of infrastructure is far from satisfactory. In Andaman Islands labour is neither cheap nor abundant due to multiple factors. The problem of availability of local labour is always a problem. The local settlers are engaged in Agriculture and only during lean season, some are available for seasonal jobs in the forests, the forest labour force is mostly manned by recruited labour from Bihar, Madhya Pradesh and Orissa.

Water Supply :

Scarcity of water is a problem in the area. During the summer months i.e. from January to March, ground water is not readily available in most of the areas, as the porus sandstone rock permits ready sub-soil drainage and the undulating ground drain off the rain water into the sea. Inspite of lot of rainfalls (i.e. 32.40 mm.) it is a parado- that water is scarce in the Islands because not much has been done by way of damming the water stream or making reservoirs for collecting rain water. Both at Hut Bay and Mayabunder, Becon Bay area, drinking water is at present obtained from open ground wells about 6-7 m. deep.

The industrial possibility as indicated hereunder are subject to conditions that all the aforesaid hazards are properly looked into.

Various Government Department as well as international Organization have been very critical about the pattern of felling being followed in the Andaman Island. They are pointing at poor status of soil from where vegetation has been stripped off. The areas rehabilitated for the refugees and also felled for plantation of crop have showed a marked deterioration. The Government Of India set up a multi disciplinary study t in 1976 for suggesting the Govt. about the present system of work. At present the Government is actively considering to set up another task force for evaluating the present system of land use. Under this circumstances, the State Government should consider whether the felling should be confined for obtaining natural regeneration and clearfelling should be completely done away with.

APPENDIX - I

MATHODOLOGY AND OPERATIONAL PROCEDURES ADOPTED FOR FOREST TYPE MAPPING OF NORTH ANDAMANS USING AERIAL PHOTOGRAPHS.

1. Aerial Photographic Coverage :

Aerial photography undertaken during January - February, 1974, for Naval Hydrographic for Andaman and Nicobar Islands was made available for the purpose of photo-interpretation. The specifications of the photographs are as under :-

i)	Type of photographs	:	Panchromatic Black and White.
ii)	Agency	:	I.A.F.
iii)	Specification No.	:	764-A, Area A and B.
iv)	Camera used	:	R.M.K.
v)	Focal length of the camera	:	15.3 cm.
vi)	Format size	:	23 cm. x 23 cm.
vii)	Scale of photography	:	1:25,000
viii)	Year of photography	:	January - February, 1974.

The photographs have few draw-backs, which made photo-interpretation difficult and at places doubtful. The drawbacks which might have resulted in somewhat in-accurate delineation of various strata are mentioned below :-

i) Printing of photos is exceptionally defective as the total contrasts of similar objects appear different in fifty percent of strips and many times even in an individual photo (half portion is printed dark and half light). This has proved quite deceptive for the purpose of photo-interpretation.

ii) The photography was carried out during January - February, the time when all deciduous trees do not become leafless. Had the photography been taken during March - April, all deciduous trees would have become leafless, resulting accurate delineation among Evergreen, Semi-evergreen and Deciduous forest types. Thus the possibility of putting Deciduous forest areas under Semi-evergreen type, or Evergreen type is likely to creep in.

iii) There are several gaps, i.e. areas where either the photography has not been done or areas for which photos have not been supplied due to security reasons. Such areas are marked as gaps and photo-interpretation and mapping restricted to portions for which photos were supplied.

2. Availability of Base Maps :

Recent topo maps on 1:25,000 scale prepared by Survey Of India are used to provide the base map for transferring the photo details

Photo-interpretation Objectives

Photo-interpretation of the area was taken up to achive the following objectives :-

i) To prepare detailed land use & Forest cover type map of the Islands.

ii) To stratify the crop into homogenous strata for planning forest resources inventory.

iii) To delineate the area into land type classes depending upon the topography, terrain for the purpose of rehabilitation plan and future forest management plan.

4. Photo-interpretation Parameters

To achieve the above objectives, following parameters were conse-dered for photo-interpretation :

i) Delineation of vegetation types and land use classification.

ii) Density classification.

iii) Terrain classification.

In order to define these parameters, photographs were scanned and studied under Stereoscope at headquaters office, Dehradun and later on [illegible] the field, where co-relation between photo parameters and field parameters have been established, keeping in view the limitations of the available photographs. As a result of these studies, the levels of photo-interpre-tation in each case were defined as under :-

4.1 Delineation of vegetation types and land-use classifi[illegible]

As per classification of forest types, according to Champion & Seth, there are eleven forest types in this area. Accordingly, [illegible] tried to distinguish eleven vegetation types on the photo on the basis of tone, texture, pattern size, shape of the crowns of the trees. But looking to the limitations of photo-interpretation technique as applied to the available B & W panchromatic photographs it could be possible to distinguish only the following vegetation types:

i) Evergreen Forests

ii) Semi-evergreen Forests

iii) Moist Deciduous forests

iv) Mangrove Forests

v) Plantations

vi) Scrub Forests

vii) Scrub with Bamboos.

In Non-forest area, land classification was carried out as per the existing land-use, as seen and interpreted on the photo.

4.2 Density classification:

Stratification into homogenous strata depends on several factors. Some of the main factors which are usually considered for delineation are :

i) Crop average height
ii) Size and shape of crowns
iii) Crown density of the crop.

The first two factors are not considered for making homogenous strata due to photo-interpretation limitations on the available photos. Here, only density aspect has been considered which is based on emergent, dominant and co-dominant trees. The following density classes have been adopted for classification purpose :

			Code
1.	More than 60%	—	1
2.	30% to 60%	—	2
3.	5 to 30%	—	3

The density code has been assigned in the denominator.

4.3 Stratification of terrain classes:

Attempt has been made to classify terrain by studying aerial photographs under steroscope rather than doing in on topo sheets. In this respect an experiment was carried out and on the basis of the result of the experiment, it was concluded that terrain classification carried under three dimentional effect diredtly on photo is much more relevant and prac--tical from forestry point of view, than to do it on topo-sheets. However, in case of doubt, topo sheets were also examined.

Examination and studies of photographs have revealed the following terrain classification :

i) Flat to gently rolling and undulating terrain
ii) Moderately hilly terrain
iii) Hilly terrain

This terrain classification, at best, can be a generalised assess--ment of topography than what it may actually be in the field. However, it was felt that this forms the basis and would serve the purpose for achieving the third objective.

5. The Classification Systems:

5.1 Type Size Specifications

Minimum area for delineation in forest stands and non-forest land was considered as .5 cm. x .5 cm. on 1:25,000.

For terrain classes the approximate minimum areas are kept variable i.e. for first two terrain classes minimum area of delineation is kept as 100 ha. and for class 3 it is kept as 40 ha.

Linear objects such as rivers, creeks, streams, forests and land-use types less than 2 mm. wide on photographs were not separated on 1:25,000

5.2 The forest and land-use classification

The vegetation types and land use classes used in photo-interpre--tation are as below :

5.2.1 Forested areas

Mangrove forests - Earlier distinguished from rest of the forest crop because of their gregarious nature. These are composed of a few species of a particular family namely Rhizophoraceae.

M^1 This type consists mainly of Rhizophora spp. more or less in pure form. The crop appears like a woolen carpet in dark grey tone on aerial photos. This is homogeneous, uniform and having comparatively lesser average height and mostly found in totally merged or sub-merged Water logging areas along the sea coasts.

M^2 This crop consisting mainly of Bruguiera spp. appearing on photo more or less similar to type M^1 except the tone, which is generally whitish grey or varying to lighter grey. Crop height is more than that of M^1 and it comes on little higher elevation.

M^3 At places the species of Bruguiera and Rhizophora come intermixed unseparateable. Such areas where Bruguiera and Rhizophora come intermixed approximately in fifty fifty ratio categorised under M^3.

E/e Evergreen Forests - Includes both categories of evergreen forests i.e. Low hill valley evergreen forests and Evergreen Forests on hills. Forests are multi-storeyed and the top-most canopy is formed by tall, gigantic trees of which Dipterocarpus spp. is the most common among other associates which are Pterygota alata, Terminalia bialata, Calophylum sou--latri, Albizzia stipulata, Artocarpus chaplasa, Anthocephalus cadamba etc. Gregariousness of species is absent. The forests are dense with a closed canopy.

Crowns of individual trees are more compact, smaller in size and darker in tone. Some areas coming in this type have been exploited in the past and mature trees of commercial spp. have already been removed, whereas rest of the areas are still virgin. It is difficult to mark virgin and exploited areas but an attempt has been made to separate out areas having bigger sized crowns (i.e. Mature trees) in the top canopy from areas having only crop of smaller sized crowns (which is generally uniform in the top canopy having hardly any tree of bigger crown). Accordingly, mature crop has been given a symbol 'E' and young crop as 'e'.

S/s Semi-Evergreen Forests - A transition type between Evergreen and Moist Deciduous forests and consists of species found both in evergreen and evergreen and Moist Deciduous types. The de-marcation between Semi--evergreen and Evergreen on one hand and semi-evergreen and Moist Deciduous on the other is not sharp and may overlap. There is a variation in the size of crowns and stand height.

Tone is generally lighter than Evergreen but darker than Deciduous forests. Photo-parameters also exhibit the properties of Evergreen and Moist Deciduous forest types, simultaneously in the same region. Mature crop and young crop, as described in Evergreen forests are symbolised as 'S' and 's'.

D/d Moist - Deciduous Forests - Multi-storeyed irregular forests, confined mostly to hilly slopes and met with throughout Andaman Islands. The upper storey is mostly of deciduous species, intercepted with occasional evergreen species. The important spp. coming in these forests is Ptorocarpus dalbergioides commonly known as Padauk along with other associates, which are Terminalia bialata, T. manii, T. procera. Slightly lower in height are Canarium cuphyllum, Bombax insignee, Tetrameles nudiflora, Chukrasia tabularis and Albizzia lebbek. The species start becoming leafless from December onwards and become totally deciduous by the end of March. These species, while leafless appear lighter in tone or say whitish on panchro--matic black and white photographs. The tone factor is considered in delineating Deciduous forests from Evergreen or Semi-evergreen types. Other factors considered in identification of Deciduous forests were crown size (which are bigger and scattered) and irregularity in heights among individual spp.

Since, photographs on which the interpretation has been done were taken in Jan-Feb, 1974, some of deciduous forests had not become leafless in certain localities due to more moist conditions in the soil. Hence there is a possibility of including some patches of deciduous forest in the category of Evergreen or Semi-evergreen forests.

The symbols 'D' and 'd' are used for mature and young crop in this category also.

Beach Forests (Littoral Forests) - These forests could not be distinguised separately on erial photos as the characters of photo-parameters of this type have been mixed with low-Evergreen Forests. Therefore, this type has been merged with Ever-green Forests only.

P Plantations - Plantations raised in forest areas such as Teak, Padauk, Pyrema, Coconut or any other spp. irrespective of their age are taken up in this category. Plantation areas could be easily distinguished from natural forest crop due to their homogenous texture and uniformity in the pattern of crops.

Sc Scrub Forests - Areas having stunted growth of vegetation, average height being less than 6 metres or so. Such areas are very small in extent and occur where climatic conditions are adverse such as on saddle hills where wind velocity is too much or soil factors are not favourable. These areas could be identified on photos due to their light grey tone, lesser height and small sized crown of trees.

Sb Scrub forests with bamboos - Although bamboos and canes are commonly found in Evergreen, Semi-evergreen and Moist-Deciduous forests of Andaman Islands, but these are not seen on aerial photos as they come in the under-storey. The top storeys of these forests are so dense and compact that under-storey is hardly visible on aerial photos. So attempt has not been made to mark bamboo areas in such forests. However, when bamboos or canes occur as pure patches or inter-mixed with scrub forests, these have been marked on aerial photos.

B. Forests Blanks - Areas without any tree growth of having .05 tree density coming within forest area taken up in this class.

5.2.2 Non-Forest Areas

C Cultivation and habitation - Cultivated fields and villages and habitation areas were included in this type.

W Water Bodies - Include reservoirs, big tanks, ponds, natural streams, rivers and creeks, if their width is more than 2 mm. on photo on 1 : 25,000 and 4 mm on 1 : 12,500 photo scale.

Water surface appears in dark grey to white in tone depending upon the sun angle and the camera position.

'O' Orchard's and Non-Forestry Plantation - Orchard's and Non-Forestry plantations such as of Coconut, Rubber, tea or coffee gardens included in this category. These are generally located out-side the forests. The signs of habitation in the vicinity are also seen.

'X' Barren areas and grass lands - Grass-lands and Barren areas found in Non-forested area are included in this category. Trees in such areas are either very scanty or absent. Such areas appear in grey tone and smooth in texture.

5.3 The Density classification of forested areas - The density classes used throughout the photo-interpretation were based on the extent of the crown of over-storey trees i.e. dominants and co-dominants only.

Three crown-cover density classes were recognised.

1. High Density : Over 60% crown cover occupies by over-storey trees.
2. Medium Density : From 30 to 60% of crown cover occupied by over-storey trees.
3. Low Density : From 5 to 30% of crown cover occupied by over-storey trees.

Density less than 5% will come in Forest Blanks category. No density classification done in Mangrove forests, Bamboo/Scrub forests and plantations.

5.4. Terrain Classification - Each delineated unit classified into terrain classes. Three classes were defined as below :

1. Flat to gently sloping and undulating terrain

Level, gentle to moderately undulating or sloping country. It includes low-lands, flat plains plateaus, wide U - shaped valleys, gently hilly country or relatively level country broken by a series of low hills which form a corrugated or washboard appearance. Average slope not exceeding 7%.

2. Moderately hilly terrain

It includes moderate long slopes, slope gradient variable but will be steeper in comparison to slopes covered in category I. Country usually rough and sharply dissected. Average slope not exceeding 25%.

3. Hilly terrain

It includes excessively stoop country and vertical cliffs. More than half of the area with long continuous slopes having gradients in excess of 25%.

6. Method of Annotation

In each delineated forest type and land use class, prescribed and code symbols were given. Density code assumed in Numerator and terrain classification in the denominator e.g. $\frac{E-1}{2}$, means forests belong to Evergreen category and the crop will be of high density (more than 60 percent). Its terrain type moderately hilly.

7. Availability of Topo maps

The Project area is covered by the following 1:25,000 scale survey of India topo-sheets.

1.	86 C/12,6	1
2.	86 C/14/3 & 6	2
3.	86 C/15/1,2,3,4,5 & 6	6
4.	86 C/16/1,2,3,4,5 & 6	6
5.	86 D/9/4	1
6.	86 D/13/1,2,3,4, & 5	5
7.	86 G/2/1,2 & 3	3
8.	86 G/3/1,2 & 3	3
9.	86 G/4/1,2 & 3	3
10.	86 H/1/1	1
11.	86 K/7/1 & 2	2
	Total :	33

Out of these above sheets, only following sheets could be made available by Survey of India for the purpose of transferring the photo details to base maps.

1.	86 C/12/6	1
2.	86 C/14/3 & 6	2
3.	86 C/15/2,4 & 5	3
4.	86 C/16/1,4 & 6	3
5.	86 D/9/4	1
6.	86 D/13/1,2,3 & 4	4
7.	86 G/3/3	1
8.	86 G/3/1 & 2	2
9.	86 G/4/1 & 3	2
10.	86 H/1/1	1
	Total :	20

8. 100% Photo-interpretation

Hundred percent photo-interpretation was carried out by Stereoscopic examination of aerial photographs. The preliminary photo preparation work viz marking of principal points, their transference, drawing of match lines and marking of effective area were carried out before starting 100% photo-interpretation work. While marking the effective area, it was ensured that no area is either left out or included twice. Photointerpretation was confined to the effective area marked on each photograph.

The general land use pattern and distribution of forest types in the project area were studied on photos during pre-field scanning and later on in the field. In January, 1978 field verification and photo--interpretation checking was carried out by the Photo-interpretation Party. On the basis of field studies, above mentioned classification system was evolved. The interpretation has been carried out by photo-interpreters of the organisation.

9. Preparation of thematic maps

The interpreted details of the aerial photographs were directly transferred to above referred available Survey of India topo base maps on 1:25,000 scale. The transference work was done by the trained staff of the Survey of India who had sufficient experience in photogrammetry and vegetation mapping. Vertical sketchmaster was used for the purpose. The transference checking, edge adjustment of the sheets was carried out jointly by the officers of Preinvestment Survey and Survey of India. Fair drawing originals were prepared for taking Ammonia copies of Forest type maps.

10. Area Calculation

For the purpose of area calculation dot grid templot was used. Area under different land use and forest types in each sheet was tabulated separately and complied.

TABLE NO. 1.1.1.

STEMS PER HECTARE BY SPECIES AND DIAMETER CLASSES

NORTH ANDAMAN — STRATUM - TROPICAL RAIN FOREST

SPECIES NAME	SP. CODE	DIAMETER CLASSES (IN CM.) 10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total
Dipterocarpus species	1	7.642	3.327	1.762	1.128	1.015	0.549	0.225	0.310	0.225	0.324	16.507
Amoora wallichii	2	0.408	0.183	0.141	0.112	0.084	0.056	0.014	0.000	0.000	0.014	1.012
Parishia insignis	3	1.424	0.705	0.507	0.352	0.112	0.126	0.042	0.028	0.014	0.028	3.338
Terminalia bialata	4	0.521	0.338	0.324	0.338	0.267	0.155	0.070	0.042	0.028	0.070	2.153
Terminalia procera	5	1.573	1.621	1.452	0.747	0.451	0.267	0.084	0.028	0.014	0.042	6.285
Canarium euphyllum	6	0.958	0.747	0.197	0.155	0.253	0.155	0.084	0.056	0.028	0.014	2.647
Endospermum melaccense	7	0.056	0.098	0.014	0.098	0.028	0.014	0.056	0.000	0.000	0.000	0.364
Anthocaphalus cadamba	8	0.338	0.437	0.084	0.084	0.014	0.000	0.000	0.014	0.000	0.000	0.971
Salmalia insignis	9	0.310	0.422	0.338	0.310	0.098	0.070	0.014	0.028	0.014	0.014	1.618
Sideroxylon longepetiolatum	10	1.607	0.479	0.282	0.070	0.056	0.042	0.000	0.000	0.000	0.014	2.550
Pteroceymbium tinctorium	11	3.031	2.213	1.917	1.410	0.817	0.296	0.098	0.070	0.014	0.000	9.866
Artocarpus chaplasha	12	2.650	1.931	1.536	0.789	0.521	0.296	0.042	0.098	0.014	0.028	7.905
Artocarpus lakoocha	13	1.959	1.452	0.648	0.225	0.028	0.028	0.000	0.000	0.000	0.014	4.354
Hopea odorata	14	0.394	0.155	0.098	0.042	0.028	0.000	0.014	0.000	0.000	0.000	0.731
Pajanelia longifolia	15	1.325	0.507	0.296	0.239	0.155	0.028	0.070	0.000	0.000	0.042	2.662
Adenanthera pavonina	16	0.578	0.126	0.070	0.042	0.000	0.000	0.000	0.014	0.000	0.000	0.830
Planchonia andamanica	17	0.789	0.521	0.479	0.493	0.380	0.155	0.169	0.112	0.042	0.014	3.154
Diploknema butyracea	18	0.380	0.239	0.310	0.098	0.112	0.126	0.028	0.014	0.000	0.000	1.307
Linnea coromandelica	20	1.395	1.536	1.297	0.705	0.352	0.141	0.042	0.042	0.014	0.000	5.524
Lagerstroemia hypoleuca	21	1.579	0.662	0.225	0.169	0.155	0.112	0.155	0.056	0.070	0.014	1.197
Terminalia manii	22	0.972	0.394	0.267	0.098	0.112	0.126	0.056	0.014	0.000	0.028	2.067
Calophyllum inophyllum	23	0.014	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.014
Manilkara littoralis	24	0.549	0.126	0.112	0.056	0.000	0.000	0.000	0.000	0.000	0.014	0.857
Albizzia lebbek	25	0.465	0.394	0.338	0.225	0.126	0.042	0.000	0.042	0.000	0.000	1.632
Sageraea elliptica	27	2.650	0.324	0.028	0.000	0.014	0.000	0.000	0.000	0.000	0.000	3.016
Diospyros marmorata	28	6.415	1.325	0.239	0.042	0.000	0.014	0.000	0.000	0.000	0.000	8.035
Murraya paniculata	29	0.042	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.042
Podocarpus nerifolia	30	0.056	0.014	0.014	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.084
Myristica species	31	17.582	4.314	1.424	0.662	0.253	0.126	0.028	0.014	0.000	0.000	24.403
Duabanga sonneritioides	32	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.014	0.014
Albizzia stipulata	33	0.056	0.028	0.112	0.098	0.084	0.014	0.028	0.014	0.000	0.014	0.440

Contents

SPECIES NAME	SP. CODE	DIAMETER CLASSES (IN CM.) 10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total
Mangifera andamanica	34	1.339	0.239	0.056	0.042	0.056	0.000	0.014	0.014	0.000	0.014	1.774
Alstonia scholaris	37	0.042	0.014	0.014	0.014	0.000	0.000	0.000	0.000	0.000	0.014	0.098
Tetrameles nudiflora	38	0.437	0.267	0.211	0.296	0.253	0.126	0.155	0.084	0.084	0.141	2.054
Pterygota alata	39	0.098	0.014	0.028	0.014	0.000	0.000	0.000	0.000	0.000	0.000	0.154
Gmelina arborea	41	0.028	0.000	0.000	0.014	0.000	0.000	0.000	0.000	0.000	0.000	0.042
Sterculia villosa	42	1.917	2.058	0.958	0.479	0.112	0.056	0.000	0.014	0.000	0.000	5.594
Spondias mangifera	43	0.874	0.620	0.267	0.084	0.014	0.000	0.000	0.014	0.000	0.000	1.873
Nauclea gagana	44	0.535	0.366	0.352	0.084	0.042	0.042	0.014	0.028	0.014	0.000	1.477
Pometia pinnata	45	1.593	1.325	0.902	0.592	0.296	0.197	0.056	0.028	0.014	0.000	5.003
Antiaris toxicaria	46	0.211	0.056	0.042	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.309
Eugenia species	47	1.311	0.578	0.282	0.042	0.000	0.014	0.000	0.000	0.000	0.028	2.255
Ganophyllum falcatum	48	0.183	0.098	0.042	0.014	0.014	0.000	0.014	0.000	0.000	0.000	0.365
Terminalia catappa	49	1.170	0.465	0.126	0.042	0.028	0.000	0.000	0.000	0.000	0.000	1.833
Milusa tectona	50	1.460	0.648	0.282	0.126	0.000	0.014	0.014	0.000	0.000	0.000	2.564
Aglaia andamanica	51	2.284	0.493	0.211	0.084	0.028	0.000	0.000	0.000	0.000	0.000	3.100
Xanthophyllum andamanicum	52	1.015	0.493	0.211	0.070	0.056	0.014	0.000	0.014	0.000	0.000	1.873
Bischofia javanica	54	0.028	0.028	0.000	0.000	0.000	0.000	0.014	0.000	0.000	0.000	0.070
Dillenia pentagyna	55	0.493	0.479	0.366	0.267	0.141	0.042	0.056	0.000	0.000	0.000	1.844
Artocarpus gomeziana	56	0.197	0.253	0.042	0.028	0.028	0.000	0.000	0.000	0.000	0.000	0.548
Hibiscus tiliaceus	57	0.056	0.028	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.084
Others	58	125.588	31.400	9.926	3.694	1.522	0.535	0.366	0.380	0.070	0.183	173.664
Pterocarpus dalbergioides	66	1.297	1.142	0.592	0.606	0.437	0.507	0.437	0.352	0.366	0.972	6.708
Baccaurea sapida	67	2.157	0.690	0.155	0.056	0.014	0.000	0.000	0.000	0.000	0.000	3.072
Diospyros species	68	10.448	1.593	0.211	0.028	0.014	0.000	0.000	0.000	0.000	0.000	12.294
Pterospermum aceroides	69	6.457	1.988	0.451	0.197	0.014	0.000	0.000	0.000	0.000	0.042	9.149
TOTAL		218.962	69.953	30.238	15.660	8.584	4.485	2.459	1.924	1.025	2.096	355.386

Contents

TABLE NO. 1.1.2

STEMS PER HECTARE BY SPECIES AND DIAMETER CLASS

NORTH ANDAMAN — STRATUM - MANGROVE

SPECIES NAME	SP. CODE	DIAMETER CLASSES (IN CM.) 1 - 9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total
Rhizophora candèlaris	59	483.724	286.185	29.412	1.368	0.000	0.000	0.000	0.000	0.000	0.000	0.000	800.689
Bru guiera conjugata	61	135.842	171.136	97.948	18.057	3.419	0.410	0.273	0.000	0.000	0.000	0.000	427.085
Bruguiera perviflora	62	0.000	1.094	0.547	0.136	0.136	0.000	0.000	0.000	0.000	0.000	0.000	1.913
Avicennia officinalis	63	120.931	26.128	1.641	0.273	0.000	0.000	0.000	0.000	0.000	0.000	0.000	148.973
Heritiera littoralis	64	2.188	2.188	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.377
Others (Mangrove)	65	17.510	25.581	3.820	0.684	0.273	0.000	0.000	0.136	0.000	0.000	0.000	48.014
T O T A L		760.195	512.312	133.378	20.518	3.828	0.410	0.273	0.136	0.000	0.000	0.000	1431.050

Contents

TABLE NO. 1.2.1

TOTAL STEMS (IN '000 UNIT) BY SPECIES AND DIAMETER CLASSES

NORTH ANDAMAN — STRATUM - TROPICAL RAIN FOREST

SPECIES NAME	SPECIES CODE.	DIAMETER CLASSES (IN CM.) 10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total
Dipterocarpus species	1	1211.456	527.497	279.395	178.812	160.931	87.171	35.762	49.173	35.762	51.408	2617.367
Amoora wallichii	2	64.819	29.057	22.351	17.881	13.410	8.940	2.235	0.000	0.000	2.235	160.928
Parishia insignis	3	225.751	111.758	80.465	55.879	17.881	20.116	6.705	4.470	2.235	4.470	529.730
Terminalia bialata	4	82.700	53.643	51.408	53.643	42.468	24.586	11.175	6.705	4.470	11.175	341.973
Terminalia procera	5	250.337	257.043	230.221	118.463	71.525	42.468	13.410	4.470	2.235	6.705	996.877
Canarium euphyllum	6	151.990	118.463	31.292	24.586	40.232	24.586	13.410	8.940	4.470	2.235	420.204
Enodspermum malaccense	7	8.940	15.646	2.235	15.646	4.470	2.235	8.940	0.000	0.000	0.000	58.112
Anthocaphalus cadamba	8	53.643	69.289	13.410	13.410	2.235	0.000	0.000	2.235	0.000	0.000	154.222
Salmalia insignis	9	49.173	67.054	53.643	49.173	15.646	11.175	2.235	4.470	2.235	2.235	257.039
Sideroxylon longepetiolatum	10	254.808	75.995	44.703	11.175	8.940	6.705	0.000	0.000	0.000	2.235	404.561
Pteroceymbium tinctorium	11	480.559	350.920	303.981	223.516	129.639	46.938	15.646	11.175	2.235	0.000	1564.609
Artocarpus chaplasha	12	420.210	306.216	243.632	125.168	82.700	46.938	6.705	15.646	2.235	4.470	1253.920
Artocarpus lakoocha	13	310.687	230.221	102.817	35.762	4.470	4.470	0.000	0.000	0.000	2.235	690.662
Hopea odorata	14	62.584	24.586	15.646	6.705	4.470	0.000	2.235	0.000	0.000	0.000	116.226
Pajanelia longifolia	15	210.105	80.465	46.938	37.997	24.586	4.470	11.175	0.000	0.000	6.705	422.441
Adenanthera pavonina	16	91.641	20.116	11.175	6.705	0.000	0.000	0.000	2.235	0.000	0.000	131.872
Planchonia andamanica	17	125.168	82.700	75.995	78.230	60.349	24.586	26.821	17.881	6.705	2.235	500.670
Diploknema butyracea	18	60.349	37.997	49.173	15.646	17.881	20.116	4.470	2.235	0.000	0.000	207.867
Linnea coromandelica	20	221.280	243.632	205.634	111.758	55.879	22.351	6.705	6.705	2.235	0.000	876.179
Lagerstroemia hypoleuca	21	250.337	105.052	35.762	26.821	24.586	17.881	24.586	8.940	11.175	2.235	507.375
Terminalia manii	22	154.226	62.584	42.468	15.646	17.881	20.116	8.940	2.235	0.000	4.470	328.566
Calophyllum inophyllum	23	2.235	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.235
Manilkara littoralis	24	87.171	20.116	17.881	8.940	0.000	0.000	0.000	0.000	0.000	2.235	136.343
Albizzia lebbek	25	73.760	62.584	53.643	35.762	20.116	6.705	0.000	6.705	0.000	0.000	259.275
Sageraea elliptica	27	420.210	51.408	4.470	0.000	2.235	0.000	0.000	0.000	0.000	0.000	478.323
Diospyros marmorata	28	1016.997	210.105	37.997	6.705	0.000	2.235	0.000	0.000	0.000	0.000	1274.039
Murraya paniculata	29	6.705	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	6.705
Podocarpus nerifolia	30	8.940	2.235	2.235	0.000	0.000	0.000	0.000	0.000	0.000	0.000	13.410
Myristica species	31	2787.244	683.959	225.751	105.052	40.232	20.116	4.470	2.235	0.000	0.000	3869.059
Duabanga sonneritioides	32	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.235	2.235

Contents

SPECIES NAME	SPECIES CODE	DIAMETER CLASSES (IN CM.) 10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total
Albizzia stipulata	33	8.940	4.470	17.881	15.646	13.410	2.235	4.470	2.235	0.000	2.235	71.522
Mangifera andamanica	34	242.340	37.997	8.940	6.705	8.940	0.000	2.235	2.235	0.000	2.235	281.627
Alstonia scholaris	37	6.705	2.235	2.235	2.235	0.000	0.000	0.000	0.000	0.000	2.235	15.645
Tetrameles nudiflora	38	69.289	42.468	33.527	46.938	40.232	20.116	24.586	13.410	13.410	22.351	326.327
Pterygota alata	39	15.646	2.235	4.470	2.235	0.000	0.000	0.000	0.000	0.000	0.000	24.586
Gmelina arborea	41	4.470	0.000	0.000	2.235	0.000	0.000	0.000	0.000	0.000	0.000	6.705
Sterculia villosa	42	303.981	326.333	151.990	75.995	17.881	8.940	0.000	2.235	0.000	0.000	887.355
Spondias mangifera	43	138.579	98.347	42.468	13.410	2.235	0.000	0.000	2.235	0.000	0.000	297.274
Nauclea gag eana	44	84.936	58.114	55.879	13.410	6.705	6.705	2.235	4.470	2.235	0.000	234.689
Pometia pinnata	45	252.573	210.105	143.050	93.876	46.938	31.292	8.940	4.470	2.235	0.000	793.479
Antiaris toxicaria	46	33.527	8.940	6.705	0.000	0.000	0.000	0.000	0.000	0.000	0.000	49.172
Eugenia species	47	207.869	91.641	44.703	6.705	0.000	2.235	0.000	0.000	0.000	4.470	357.623
Ganophyllum falcatum	48	29.057	15.646	6.705	2.235	2.235	0.000	2.235	0.000	0.000	0.000	58.113
Terminalia catappa	49	185.518	73.760	20.116	6.705	4.470	0.000	0.000	0.000	0.000	0.000	290.569
Milusa tectona	50	234.691	102.817	44.705	20.116	0.000	2.235	2.235	0.000	0.000	0.000	406.797
Aglaia andamanica	51	362.095	78.230	33.527	13.410	4.470	0.000	0.000	0.000	0.000	0.000	491.732
Xanthophyllum andamanicum	52	160.931	78.230	33.527	11.175	8.940	2.235	0.000	2.235	0.000	0.000	297.273
Bischofia javanica	54	4.470	4.470	0.000	0.000	0.000	0.000	2.235	0.000	0.000	0.000	11.175
Dillenia pentagyna	55	78.230	75.995	58.114	42.468	22.351	6.705	8.940	0.000	0.000	0.000	292.803
Artocarpus gomeziana	56	31.292	40.232	6.705	4.470	4.470	0.000	0.000	0.000	0.000	0.000	87.169
Hibiscus tiliaceus	57	8.940	4.470	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	13.410
Others	58	19908.571	4977.701	1573.552	585.611	241.397	84.936	58.114	60.349	11.175	29.057	27530.463
Pterocarpus dalbergioides	66	205.634	181.047	93.876	96.111	69.289	80.465	69.289	55.879	58.114	154.226	1063.930
Baccaurea sapida	67	341.979	109.522	24.586	8.940	2.235	0.000	0.000	0.000	0.000	0.000	487.262
Diospyros species	68	1656.253	252.573	33.527	4.470	2.235	0.000	0.000	0.000	0.000	0.000	1949.058
Pterospermum aceroides	69	1023.703	315.157	71.525	31.292	2.235	0.000	0.000	0.000	0.000	6.705	1450.617
TOTAL		34714.244	11093.076	4796.632	2485.474	1363.430	713.003	391.139	306.208	163.161	333.032	56359.399

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TABLE NO. 1.2.2.

TOTAL STEMS (IN '000 UNIT) BY SPECIES AND DIAMETER CLASSES

NORTH ANDAMAN STRATUM - MANGROVE

SPECIES NAME	SPECIES CODE	DIAMETER CLASSES (IN CM.) 1-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total
Rhizophora candelaris	59	14150.885	8372.073	860.418	40.019	0.000	0.000	0.000	0.000	0.000	0.000	0.000	23423.395
Bruguiera conjugata	61	3973.933	5006.435	2865.394	528.257	100.048	12.005	8.003	0.000	0.000	0.000	0.000	12494.075
Bruguiera perviflora	62	0.000	32.004	16.002	3.978	3.978	0.000	0.000	0.000	0.000	0.000	0.000	55.962
Avicennia officinalis	63	3537.721	764.371	48.023	8.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4358.118
Heritiera littoralis	64	64.031	64.031	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	128.062
Others (Mangrove)	65	512.249	748.364	112.054	20.009	8.003	0.000	0.000	4.001	0.000	0.000	0.000	1404.680
TOTAL		22238.819	14987.278	3901.891	600.266	112.029	12.005	8.003	4.001	0.000	0.000	0.000	41864.292

Contents

TABLE NO. 2.1.0

VOLUME (M^3) PER HECTARE BY SPECIES AND DIAMETER CLASSES

NORTH ANDAMAN — STRATUM - TROPICAL RAIN FOREST

SPECIES NAME	SPECIES CODE.	DIAMETER CLASSES (IN CM.) 10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total
Dipterocarpus species	1	2.863	1.855	1.729	1.829	2.507	1.841	1.106	1.909	1.748	5.531	22.918
Amoora wallichii	2	0.067	0.084	0.127	0.168	0.199	0.179	0.054	0.000	0.000	0.212	1.090
Parishia insignis	3	0.217	0.319	0.458	0.538	0.252	0.407	0.186	0.154	0.087	0.227	2.845
Terminalia bialata	4	0.143	0.180	0.320	0.541	0.625	0.483	0.355	0.286	0.248	1.472	4.656
Terminalia procera	5	0.212	0.747	1.447	1.293	1.200	1.070	0.436	0.178	0.110	0.614	7.307
Canarium euphyllum	6	0.133	0.376	0.210	0.266	0.729	0.632	0.491	0.441	0.256	0.182	3.716
Endospermum melaccensis	7	0.012	0.042	0.011	0.155	0.064	0.046	0.248	0.000	0.000	0.000	0.578
Anthocaphalus cadamba	8	0.025	0.137	0.079	0.127	0.031	0.000	0.000	0.081	0.000	0.000	0.480
Salmalia insignis	9	0.038	0.171	0.272	0.447	0.217	0.225	0.058	0.147	0.093	0.112	1.780
Sideroxylon longepetiolatum.	10	0.290	0.226	0.242	0.090	0.119	0.101	0.000	0.000	0.000	0.166	1.234
Pteroceymbium tinctorium	11	0.364	0.861	1.777	2.301	2.202	1.154	0.550	0.526	0.119	0.000	9.854
Artocarpus chaplasha	12	0.622	0.938	1.259	1.031	1.032	0.822	0.204	0.656	0.135	0.797	7.496
Artocarpus lakoocha	13	0.547	0.681	0.511	0.265	0.050	0.068	0.000	0.000	0.000	0.107	2.229
Hopea odorata	14	0.063	0.064	0.084	0.063	0.069	0.000	0.067	0.000	0.000	0.000	0.410
Pajanelia longifolia	15	0.356	0.222	0.255	0.354	0.404	0.113	0.406	0.000	0.000	0.305	2.415
Adenanthera pavoniaa	16	0.090	0.062	0.060	0.065	0.000	0.000	0.000	0.075	0.000	0.000	0.352
Planchonia andamanica	17	0.133	0.244	0.436	0.761	0.874	0.519	0.710	0.611	0.277	0.119	4.684
Diploknema butyraceae	18	0.111	0.164	0.397	0.187	0.330	0.526	0.150	0.093	0.000	0.000	1.958
Lannea coromandelica	20	0.249	0.709	1.143	1.038	0.794	0.442	0.187	0.225	0.096	0.000	4.883
Lagerstroemia hypoleuca	21	0.257	0.285	0.203	0.269	0.361	0.366	0.674	0.309	0.467	0.131	3.322
Terminalia manii	22	0.147	0.173	0.237	0.145	0.248	0.404	0.243	0.071	0.000	0.352	2.020
Calophyllum inophyllum	23	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001
Manilkara littoralis	24	0.060	0.043	0.074	0.065	0.000	0.000	0.000	0.000	0.000	0.197	0.439
Albizzia lebbek	25	0.079	0.161	0.322	0.354	0.277	0.138	0.000	0.237	0.000	0.000	1.568
Sageraea elliptica	27	0.392	0.129	0.022	0.000	0.032	0.000	0.000	0.000	0.000	0.000	0.575
Diospyros marmorata	28	0.900	0.570	0.209	0.055	0.000	0.040	0.000	0.000	0.000	0.000	1.774
Murraya paniculata	29	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005
Podocarpus nerifolia	30	0.008	0.007	0.014	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.029
Myristica species	31	2.738	1.888	1.277	0.999	0.574	0.391	0.120	0.081	0.000	0.000	8.068

Contents

SPECIES NAME	SPECIES CODE	DIAMETER CLASSES (IN CM.) 10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total
Duabanga sonneritioides	32	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.169	0.169
Albizzia stipulata	33	0.009	0.015	0.110	0.162	0.182	0.047	0.118	0.071	0.000	0.119	0.833
Mangifera andamanica	34	0.190	0.113	0.051	0.062	0.135	0.000	0.054	0.076	0.000	0.126	0.807
Alstonia scholaris	37	0.004	0.006	0.014	0.019	0.000	0.000	0.000	0.000	0.000	0.343	0.386
Tetrameles nudiflora	38	0.074	0.124	0.199	0.451	0.570	0.412	0.642	0.440	0.556	1.572	5.040
Pterygota alata	39	0.011	0.005	0.024	0.018	0.000	0.000	0.000	0.000	0.000	0.000	0.058
Gmelina arborea	41	0.004	0.000	0.000	0.017	0.000	0.000	0.000	0.000	0.000	0.000	0.021
Sterculia villosa	42	0.335	0.951	0.882	0.681	0.256	0.188	0.000	0.075	0.000	0.000	3.368
Spondias mangifera	43	0.149	0.283	0.246	0.123	0.028	0.000	0.000	0.078	0.000	0.000	0.907
Nauclea gag eana	44	0.097	0.161	0.341	0.131	0.088	0.135	0.053	0.143	0.091	0.000	1.240
Pometia pinnata	45	0.280	0.635	0.833	0.905	0.655	0.625	0.257	0.157	0.094	0.000	4.441
Antiaris toxicaria	46	0.040	0.020	0.035	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.095
Eugenia species	47	0.198	0.259	0.245	0.063	0.000	0.046	0.000	0.000	0.000	0.425	1.236
Ganophyllum falcatum	48	0.031	0.041	0.042	0.022	0.035	0.000	0.060	0.000	0.000	0.000	0.231
Terminalia catappa	49	0.198	0.210	0.105	0.056	0.055	0.000	0.000	0.000	0.000	0.000	0.624
Milusa tectona	50	0.217	0.290	0.254	0.177	0.000	0.038	0.057	0.000	0.000	0.000	1.033
Aglaia andamanica	51	0.312	0.212	0.188	0.127	0.060	0.000	0.000	0.000	0.000	0.000	0.899
Xanthophyllum andamanicum	52	0.147	0.231	0.195	0.109	0.130	0.038	0.000	0.081	0.000	0.000	0.931
Bischofia javanica	54	0.003	0.016	0.000	0.000	0.000	0.000	0.067	0.000	0.000	0.000	0.086
Dillenia pentagyna	55	0.086	0.226	0.332	0.384	0.311	0.126	0.245	0.000	0.000	0.000	1.710
Artocarpus gomeziana	56	0.036	0.123	0.035	0.037	0.067	0.000	0.000	0.000	0.000	0.000	0.298
Hibiscus tiliaceus	57	0.011	0.009	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.020
Others	58	18.383	13.705	8.744	5.525	3.432	1.691	1.508	2.092	0.457	2.913	58.450
Pterocarpus dalbergioides	66	0.214	0.534	0.514	0.932	1.034	1.627	1.870	1.935	2.492	13.183	24.335
Baccaurea sapida	67	0.344	0.296	0.142	0.079	0.037	0.000	0.000	0.000	0.000	0.000	0.898
Diospyros species	68	1.479	0.679	0.183	0.042	0.032	0.000	0.000	0.000	0.000	0.000	2.415
Pterospermum aceroides	69	1.036	0.833	0.397	0.292	0.029	0.000	0.000	0.000	0.000	1.083	3.670
TOTAL		35.010	31.315	27.286	23.820	20.326	14.940	11.176	11.228	7.326	30.457	212.884

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TABLE NO. 2.2.1

PLYWOOD SPECIES VOLUME (M^3) PER HECTARE BY SPECIES AND DIAMETER CLASSES

NORTH ANDAMAN — STRATUM- TROPICAL RAIN FOREST

SPECIES NAME	SPECIES CODE	DIAMETER CLASSES (IN CM.) 10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total
Dipterocarpus species	1	2.863	1.855	1.729	1.829	2.507	1.841	1.106	1.909	1.748	5.531	22.918
Amoora wallichii	2	0.067	0.084	0.127	0.168	0.199	0.179	0.054	0.000	0.000	0.212	1.090
Parishia insignis	3	0.217	0.319	0.458	0.538	0.252	0.407	0.186	0.154	0.087	0.227	2.845
Terminalia bialata	4	0.143	0.180	0.320	0.541	0.625	0.483	0.355	0.286	0.248	1.472	4.653
Terminalia procera	5	0.212	0.747	1.447	1.293	1.200	1.070	0.436	0.178	0.110	0.614	7.307
T O T A L		3.502	3.185	4.081	4.369	4.783	3.980	2.137	2.527	2.193	8.056	38.813

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TABLE NO. 2.2.2

MATCH WOOD SPECIES VOLUME (M^3) PER HECTARE BY SPECIES AND DIAMETER CLASSES

NORTH ANDAMAN

STRATUM - TROPICAL RAIN FOREST

SPECIES NAME	SPECIES CODE.	DIAMETER CLASSES (IN CM.)										
		10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total
Canarium euphyllum	6	0.133	0.276	0.210	0.266	0.729	0.632	0.491	0.441	0.256	0.182	3.716
Endospermum melaccensa	7	0.012	0.042	0.011	0.155	0.064	0.046	0.248	0.000	0.000	0.000	0.578
Anthocephalus cadamba	8	0.025	0.137	0.079	0.127	0.031	0.000	0.000	0.081	0.000	0.000	0.480
Salmalia insignis	9	0.038	0.171	0.272	0.447	0.217	0.225	0.058	0.147	0.093	0.112	1.780
Sideroxylon longepetiolatum	10	0.290	0.226	0.242	0.090	0.119	0.101	0.000	0.000	0.000	0.166	1.234
Pteroceymbium tinctorium	11	0.364	0.861	1.777	2.301	2.202	1.154	0.550	0.526	0.119	0.000	9.854
T O T A L		0.862	1.813	2.591	3.386	3.362	2.158	1.347	1.195	0.468	0.460	17.642

Contents

Table No. 2.2.3

Constructional Wood Species Volume (M^3) Per Hectare By Species And Diameter Classes

North Andaman — Stratum - Tropical Rain Forest

Species Name	Sp. Code.	DIAMETER CLASSES (in cm.) 10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total
Artocarpus chaplasha	12	0.622	0.938	1.259	1.031	1.032	0.822	0.204	0.656	0.135	0.797	7.496
Artocarpus lakoocha	13	0.547	0.681	0.511	0.265	0.050	0.068	0.000	0.000	0.000	0.107	2.229
Hopea odorata	14	0.063	0.064	0.084	0.063	0.069	0.000	0.067	0.000	0.000	0.000	0.410
Pajanelia longifolia	15	0.356	0.222	0.255	0.354	0.404	0.113	0.406	0.000	0.000	0.305	2.415
Adenanthera pavonina	16	0.090	0.062	0.060	0.065	0.000	0.000	0.000	0.075	0.000	0.000	0.352
Planchonia andamanica	17	0.133	0.244	0.436	0.761	0.874	0.519	0.710	0.611	0.277	0.119	4.684
Diploknema butyracea	18	0.111	0.164	0.397	0.187	0.330	0.526	0.150	0.093	0.000	0.000	1.958
Lannea coromandelica	20	0.249	0.709	1.143	1.038	0.794	0.442	0.187	0.225	0.096	0.000	4.883
Lagerstroemia hypoleuca	21	0.257	0.285	0.203	0.269	0.361	0.366	0.674	0.509	0.467	0.131	3.322
Terminalia manii	22	0.147	0.173	0.237	0.145	0.248	0.404	0.243	0.071	0.000	0.352	2.020
Calophyllum inophyllum	23	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001
Manilkara littoralis	24	0.060	0.043	0.074	0.065	0.000	0.000	0.000	0.000	0.000	0.197	0.439
Albizzia lebbek	25	0.079	0.161	0.322	0.354	0.277	0.138	0.000	0.237	0.000	0.000	1.568
Total		2.715	3.746	4.981	4.597	4.439	3.398	2.641	2.277	0.975	2.008	31.777

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TABLE NO. 2.2.4

ORNAMENTAL WOOD SPECIES VOLUME (M^3) PER HECTARE BY SPECIES AND DIAMETER CLASSES

NORTH ANDAMAN

STRATUM - TROPICAL RAIN FOREST

Species Name	Species Code	Diameter Classes (in cm.)										
		10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total
Sageraea elliptica	27	0.392	0.129	0.022	0.000	0.032	0.000	0.000	0.000	0.000	0.000	0.575
Diospyros marmorata	28	0.900	0.570	0.209	0.055	0.000	0.040	0.000	0.000	0.000	0.000	1.774
Murraya paniculata	29	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005
Podocarpus nerifolia	30	0.008	0.007	0.014	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.029
Pterospermum dalbergioides	66	0.214	0.534	0.514	0.932	1.034	1.627	1.870	1.935	2.492	13.183	24.335
T O T A L		1.519	1.240	0.759	0.987	1.066	1.667	1.870	1.935	2.492	13.183	26.718

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TABLE NO. 2.2.5

NON-COMMERCIAL WOOD SPECIES VOLUME (M^3) PER HECTARE BY SPECIES AND DIAMETER CLASSES

NORTH ANDAMAN — STRATUM-TROPICAL RAIN FOREST

Species Name	Species Code	Diameter Classes (in cm.) 10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total
Myristica species	31	2.738	1.888	1.277	0.999	0.574	0.391	0.120	0.081	0.000	0.000	8.068
Duabanga sonneritioides	32	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.169	0.169
Albizzia stipulata	33	0.009	0.015	0.110	0.162	0.182	0.047	0.118	0.071	0.000	0.119	0.833
Mangifera andamanica	34	0.190	0.113	0.051	0.062	0.135	0.000	0.054	0.076	0.000	0.126	0.807
Alstonia scholaris	37	0.004	0.006	0.014	0.019	0.000	0.000	0.000	0.000	0.000	0.343	0.386
Tetrameles nudiflora	38	0.074	0.124	0.199	0.451	0.570	0.412	0.642	0.440	0.556	1.572	5.040
Pterygota alata	39	0.011	0.005	0.024	0.018	0.000	0.000	0.000	0.000	0.000	0.000	0.058
Gmelina arborea	41	0.004	0.000	0.000	0.017	0.000	0.000	0.000	0.000	0.000	0.000	0.022
Sterculia villosa	42	0.335	0.951	0.882	0.681	0.256	0.188	0.000	0.075	0.000	0.000	3.368
Spondias mangifera	43	0.149	0.283	0.246	0.123	0.028	0.000	0.000	0.078	0.000	0.000	0.907
Nauclea gagedana	44	0.097	0.161	0.341	0.131	0.088	0.135	0.053	0.143	0.091	0.000	1.240
Pometia pinnata	45	0.280	0.635	0.833	0.905	0.655	0.625	0.257	0.157	0.094	0.000	4.441
Antiaris toxicaria	46	0.040	0.020	0.035	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.095
Eugenia species	47	0.198	0.259	0.245	0.063	0.000	0.046	0.000	0.000	0.000	0.425	1.236
Ganophyllum falcatum	48	0.031	0.041	0.042	0.022	0.035	0.000	0.060	0.000	0.000	0.000	0.231
Terminalia catappa	49	0.198	0.210	0.105	0.056	0.055	0.000	0.000	0.000	0.000	0.000	0.624
Milusa tectona	50	0.217	0.290	0.254	0.177	0.000	0.038	0.057	0.000	0.000	0.000	1.033
Aglaia andamanica	51	0.312	0.212	0.188	0.127	0.060	0.000	0.000	0.000	0.000	0.000	0.899
Xanthophyllum andamanicum	52	0.147	0.231	0.195	0.109	0.130	0.038	0.000	0.081	0.000	0.000	0.931
Bischofia javanica	54	0.003	0.016	0.000	0.000	0.000	0.000	0.067	0.000	0.000	0.000	0.086
Dillenia pentagyna	55	0.086	0.226	0.332	0.384	0.311	0.126	0.245	0.000	0.000	0.000	1.710
Artocarpus gomeziana	56	0.036	0.123	0.035	0.037	0.067	0.000	0.000	0.000	0.000	0.000	0.298
Bibiscus tiliacaus	57	0.011	0.009	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.020
Others	58	18.383	13.705	8.744	5.525	3.432	1.691	1.508	2.092	0.457	2.913	58.450
Baccaurea sapida	67	0.344	0.296	0.142	0.079	0.037	0.000	0.000	0.000	0.000	0.000	0.898
Diospyros species	68	1.479	0.679	0.183	0.042	0.032	0.000	0.000	0.000	0.000	0.000	2.415
Pterospermum aceroides	69	1.036	0.833	0.397	0.292	0.029	0.000	0.000	0.000	0.000	1.083	3.670
TOTAL		26.412	21.331	14.874	10.481	6.676	3.737	3.181	3.294	1.198	6.750	97.934

Contents

Table No. 2.3.1

PLY WOOD VOLUME (M^3) PER HECTARE BY SPECIES AND DIAMETER CLASS (IN CMS.)

NORTH ANDAMAN — STRATUM-TROPICAL RAIN FOREST

Species Name	Sp. Code.	Diameter Classes (in C.M.) 10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100+	Total
Dipterocarpus species	1	-	-	0.337	0.832	1.592	1.362	0.907	1.632	1.468	4.369	12.499
Amoora wallichii	2	-	-	0.025	0.076	0.126	0.132	0.044	-	-	0.168	0.571
Parishia insignis	3	-	-	0.089	0.245	0.160	0.301	0.152	0.132	0.073	0.179	1.331
Terminalia bialata	4	-	-	0.062	0.246	0.397	0.358	0.291	0.244	0.208	1.163	2.969
Terminalia procera	5	-	-	0.282	0.588	0.762	0.792	0.358	0.152	0.093	0.485	3.512
Total		-	-	0.795	1.987	3.037	2.945	1.752	2.160	1.842	6.364	20.882

Contents

Table No. 2.3.2

Match Wood Volume (M^3) Perhectare by Species & Diameter Classes

NORTH ANDAMAN — STRATUM-TROPICAL RAIN FOREST

Species Name	Sp. Code.	DIAMETER CLASSES (IN CM.) 10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total
Canarium Euphyllum	6	-	-	0.125	0.189	0.587	0.544	0.442	0.398	0.234	0.161	2.680
Endospermum melaccense	7	-	-	0.007	0.110	0.051	0.039	0.223	-	-	-	0.430
Anthocaphalus cadamba	8	-	-	0.047	0.090	0.025	-	-	0.074	-	-	0.236
Salmalia insignis	9	-	-	0.162	0.317	0.174	0.194	0.052	0.132	0.085	0.099	1.215
Sideroxylon longepetiolatum	10	-	-	0.144	0.064	0.096	0.087	-	-	-	0.147	0.538
Pteroceymbium tinctorium	11	-	-	1.057	1.634	1.773	0.992	0.495	0.474	0.109	-	6.534
Total		-	-	1.542	2.404	2.706	1.856	1.212	1.078	0.428	0.407	11.633

Contents

Table No.2.3.3

Constructional Wood Volume (M^3) Per Hectare By Species And Diameter Classes

North Andaman — Stratum - Tropical Rain Forest.

Species Name	Sp. Code.	DIAMETER CLASSES (IN CM.) 10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total
Artocarpus chaplasha	12	-	-	0.541	0.562	0.671	0.600	0.162	0.554	0.119	0.704	3.913
Artocarpus lakoocha	13	-	-	0.220	0.144	0.032	0.050	-	-	-	0.095	0.541
Hopea odorata	14	-	-	0.036	0.034	0.045	-	0.053	-	-	-	0.168
Pa janelia andamanica	15	-	-	0.110	0.193	0.263	0.083	0.323	-	-	0.270	1.242
Adenanthera pavonina	16	-	-	0.026	0.035	-	-	-	0.063	-	-	0.124
Planchonia longifolia	17	-	-	0.188	0.415	0.568	0.379	0.565	0.516	0.245	0.105	2.981
Diploknema butyracea	18	-	-	0.171	0.102	0.214	0.384	0.119	0.079	-	-	1.069
Linnea coromandelica	20	-	-	0.492	0.566	0.516	0.323	0.149	0.190	0.085	-	2.321
Lagerstroemia hypoleuca	21	-	-	0.087	0.147	0.235	0.267	0.536	0.261	0.413	0.116	2.062
Terminalia manii	22	-	-	0.102	0.079	0.161	0.295	0.193	0.060	-	0.311	1.201
Manilkara littoralia	24	-	-	0.032	0.035	-	-	-	-	-	0.174	0.241
Albizzia lebbek	25	-	-	0.138	0.193	0.180	0.101	-	0.200	-	-	0.812
Total		-	-	2.143	2.505	2.885	2.482	2.100	1.923	0.862	1.775	16.675

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Table No. 2.3.4

ORNAMENTAL WOOD VOLUME (M^3) PER HECTARE BY SPECIES AND DIAMETER CLASSES

NORTH ANDAMAN STRATUM-TROPICAL RAIN FOREST

Species Name	Sp. Code.	DIAMETER CLASSES (IN CM.)										
		10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total
Sageraea elliptica	27	-	-	0.004	-	0.020	-	-	-	-	-	0.024
Diospyros marmorata	28	-	-	0.041	0.025	-	0.030	-	-	-	-	0.096
Podocarpus neriifolia	30	-	-	0.003	-	-	-	-	-	-	-	0.003
Pterocarpus dalbergioides	66	-	-	0.100	0.424	0.656	1.204	1.533	1.654	2.093	10.414	18.078
Total		-	-	0.148	0.449	0.676	1.234	1.533	1.654	2.093	10.414	18.201

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Table No. 2.3.5

Non-Commercial Wood Volume(M^3) Per Hectare By Species And Diameter Classes

North Andaman — Stratum-Tropical Rain Forest

Species Name	Sp. Code.	Diameter classes (In CM.) 10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total
Myristica species	31	-	-	0.383	0.455	0.361	0.291	0.098	0.070	-	-	1.658
Duaganga sonneretioides	32	-	-	-	-	-	-	-	-	-	0.149	0.149
Albizzia stipulata	33	-	-	0.033	0.074	0.115	0.035	0.097	0.061	-	0.105	0.520
Mangifera andamanica	34	-	-	0.015	0.028	0.085	-	0.044	0.065	-	0.111	0.348
Alstonia scholaris	37	-	-	0.004	0.009	-	-	-	-	-	0.302	0.315
Tetrameles nudiflora	38	-	-	0.060	0.205	0.359	0.307	0.526	0.378	0.484	1.383	3.702
Pterygota alata	39	-	-	0.007	0.008	-	-	-	-	-	-	0.015
Gmelina arborea	41	-	-	-	0.008	-	-	-	-	-	-	0.008
Sterculia villosa	42	-	-	0.265	0.310	0.161	0.140	-	0.064	-	-	0.940
Spondias mangifera	43	-	-	0.074	0.056	0.017	-	-	0.067	-	-	0.214
Nauclea gageana	44	-	-	0.102	0.060	0.055	0.101	0.044	0.123	0.079	-	0.564
Pometia pinnata	45	-	-	0.250	0.412	0.414	0.466	0.211	0.135	0.082	-	1.970
Antiaris toxicaria	46	-	-	0.011	-	-	-	-	-	-	-	0.011
Eugenia species	47	-	-	0.074	0.029	-	0.034	-	-	-	0.374	0.511
Ganophyllum falcatum	48	-	-	0.013	0.010	0.022	-	0.049	-	-	-	0.094
Terminalia catappa	49	-	-	0.032	0.026	0.035	-	-	-	-	-	0.093
Milusa tectona	50	-	-	0.076	0.081	-	0.028	0.047	-	-	-	0.232
Aglaia andamanica	51	-	-	0.056	0.058	0.038	-	-	-	-	-	0.152
Xanthophyllum andamanicum	52	-	-	0.058	0.050	0.084	0.028	-	0.070	-	-	0.290
Bischofia javanica	54	-	-	-	-	-	-	0.055	-	-	-	0.055
Dillenia pentagyna	55	-	-	0.099	0.175	0.196	0.094	0.201	-	-	-	0.765
Artocarpus gomeziana	56	-	-	0.011	0.017	0.042	-	-	-	-	-	0.070
Hibiscus tiliaceus	57	-	-	-	-	-	-	-	-	-	-	-
Others	58	-	-	2.623	2.514	2.159	1.260	1.237	1.799	0.398	2.563	14.553
Baccaurea sapida	67	-	-	0.043	0.036	0.023	-	-	-	-	-	0.102
Diospyros species	68	-	-	0.055	0.019	0.020	-	-	-	-	-	0.094
Pterospermum aceroides	69	-	-	0.119	0.133	0.018	-	-	-	-	0.953	1.223
Total		-	-	4.463	4.773	4.204	2.784	2.609	2.832	1.043	5.940	28.648

Contents

Table No.2.4.0

Volume (M^3) Per Hectare By Utility Class And Diameter Classes.

NORTH ANDAMAN

STRATUM : TROPICAL RAIN FOREST

Utility Classes	Diameter Classes (in CM.)										
	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total
Ply Wood	-	-	0.795	1.987	3.037	2.945	1.752	2.160	1.842	6.364	20.882
Match Wood	-	-	1.542	2.404	2.706	1.856	1.212	1.078	0.428	0.407	11.633
Constructional Wood	-	-	2.143	2.505	2.885	2.482	2.100	1.923	0.862	1.775	16.675
Ornamental Wood	-	-	0.148	0.449	0.676	1.234	1.533	1.654	2.093	10.414	18.201
Non-commercial Wood	-	-	4.463	4.773	4.204	2.784	2.609	2.832	1.043	5.940	28.648

Contents

Table No.2.4.1

Residual Wood Volume (M^3) Per Hectare By Species & Diameter Classes(in CM.)(Plywood Species)

NORTH ANDAMAN

STRATUM-TROPICAL RAIN FOREST

Species Name	Sp. Code.	Diameter classes (in CM.)										
		10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total
Dipterocarpus species	1	-	1.753	1.245	0.924	0.815	0.414	0.182	0.181	0.140	0.802	6.456
Amoora wallichii	2	-	0.079	0.091	0.085	0.065	0.040	0.009	-	-	0.031	0.400
Parishia insignis	3	-	0.301	0.330	0.271	0.082	0.092	0.031	0.015	0.007	0.033	1.162
Terminalia bialata	4	-	0.170	0.230	0.273	0.203	0.109	0.058	0.027	0.020	0.213	1.303
Terminalia procera	5	-	0.706	1.042	0.653	0.390	0.241	0.072	0.017	0.009	0.089	3.219
Total		-	3.009	2.938	2.206	1.555	0.896	0.352	0.240	0.176	1.168	12.540

Contents

Table No.2.4.2

Residual Wood Volume (M^3) Per Hectare By Species And Diameter Classes

(MATCH WOOD SPECIES)

NORTH ANDAMAN STRATUM-TROPICAL RAIN FOREST

Species Name	Sp. Code.	Diameter classes (in CM.) 10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total
Canarium euphyllum	6	-	0.128	0.051	0.039	0.051	0.035	0.025	0.022	0.012	0.013	0.376
Endospermum melaccense	7	-	0.014	0.003	0.022	0.004	0.002	0.012	-	-	-	0.057
Anthocaphalus cadamba	8	-	0.047	0.019	0.018	0.002	-	-	0.004	-	-	0.090
Salmalia insignis	9	-	0.058	0.065	0.065	0.015	0.012	0.003	0.007	0.004	0.008	0.237
Sideroxylon longepetiolatum	10	-	0.077	0.058	0.013	0.009	0.006	-	-	-	0.011	0.174
Pteroceymbium tinctorium	11	-	0.294	0.426	0.334	0.154	0.063	0.027	0.026	0.005	-	1.329
Total		-	0.618	0.622	0.491	0.235	0.118	0.067	0.059	0.021	0.032	2.263

Contents

Table No.2.4.3

Residual Wood Volume(M^3) Per Hectare By Species And Diameter Classes (Constructional Wood Species)

North Andaman — Stratum - Tropical Rain Forest

Species Name	SP. Code.	Diameter classes (in CM.)										
		10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total
Artocarpus chaplasha	12	-	0.596	0.648	0.418	0.320	0.193	0.035	0.081	0.013	0.080	2.384
Artocarpus lakoocha	13	-	0.432	0.263	0.107	0.015	0.016	-	-	-	0.011	0.844
Hopea odorata	14	-	0.041	0.043	0.025	0.021	-	0.011	-	-	-	0.141
Pajanelia longifolia	15	-	0.141	0.131	0.143	0.125	0.027	0.069	-	-	0.030	0.666
Adenanthera pavonina	16	-	0.039	0.031	0.026	-	-	-	0.009	-	-	0.105
Planchonia andamanica	17	-	0.155	0.224	0.308	0.271	0.122	0.121	0.076	0.028	0.012	1.317
Diploknema butyracea	18	-	0.104	0.204	0.076	0.102	0.124	0.026	0.012	-	-	0.648
Linnea coromandelica	20	-	0.450	0.589	0.420	0.246	0.104	0.032	0.028	0.010	-	1.879
Lagerstroemia hypoleuca	21	-	0.181	0.104	0.109	0.112	0.086	0.115	0.038	0.047	0.013	0.805
Terminalia manii	22	-	0.110	0.122	0.059	0.077	0.095	0.041	0.009	-	0.035	0.548
Calophyllum inophyllum	23	-	-	-	-	-	-	-	-	-	-	-
Manilkara littoralis	24	-	0.027	0.038	0.026	-	-	-	-	-	0.020	0.111
Albizzia lebbek	25	-	0.102	0.166	0.143	0.086	0.032	-	0.029	-	-	0.558
Total		-	2.378	2.563	1.860	1.375	0.799	0.450	0.282	0.098	0.201	10.006

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Table No.2.4.4

Residual Wood Volume (M^3) Per Hectare By Species And Diameter Classes (Ornamental Wood Species)

NORTH ANDAMAN

STRATUM-TROPICAL RAIN FOREST

Species Name	Sp. Code.	Diameter Classes (in CM.)										
		10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total
Sageraea elliptica	27	-	0.122	0.016	-	0.010	-	-	-	-	-	0.148
Diospyros marmorata	28	-	0.539	0.150	0.028	-	0.009	-	-	-	-	0.726
Podocarpus nerifolia	30	-	0.006	0.010	-	-	-	-	-	-	-	0.016
Pterocarpus dalbergioides	66	-	0.505	0.370	0.470	0.336	0.366	0.308	0.184	0.199	1.911	4.649
Total		-	1.172	0.546	0.498	0.346	0.375	0.308	0.184	0.199	1.911	5.539

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Table No. 2.4.5

Residual Wood Volume (M^3) Per Hectare By Species And Diameter Classes(Non-Commercial Wood Species)

North Andaman — Stratum - Tropical Rain Forest

Species Name	Sp. Code.	Diameter Classes (In CM.) 10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total
Myristica species	31	-	1.435	0.766	0.475	0.196	0.090	0.018	0.009	-	-	2.989
Duagamga sonneratioides	32	-	-	-	-	-	-	-	-	-	0.016	0.016
Albizzia stipulata	33	-	0.011	0.066	0.077	0.062	0.011	0.018	0.008	-	0.011	0.264
Mangifera andamanica	34	-	0.086	0.031	0.029	0.046	-	0.008	0.009	-	0.012	0.221
Alstonia scholaris	37	-	0.005	0.008	0.009	-	-	-	-	-	0.033	0.055
Tetramales nudiflora	38	-	0.094	0.119	0.214	0.194	0.095	0.097	0.051	0.056	0.149	1.069
Pterygota alata	39	-	0.004	0.014	0.009	-	-	-	-	-	-	0.027
Gmelina arborea	41	-	-	-	0.008	-	-	-	-	-	-	0.008
Sterculia villosa	42	-	0.723	0.529	0.323	0.087	0.043	-	0.009	-	-	1.714
Spondias mangifera	43	-	0.215	0.148	0.058	0.010	-	-	0.009	-	-	0.440
Nauclea gagadana	44	-	0.122	0.205	0.062	0.030	0.031	0.008	0.016	0.009	-	0.483
Pometia pinnata	45	-	0.483	0.500	0.430	0.223	0.144	0.039	0.018	0.009	-	1.846
Antiaris toxicaria	46	-	0.015	0.021	-	-	-	-	-	-	-	0.036
Eugenia species	47	-	0.197	0.147	0.030	-	0.010	-	-	-	0.040	0.424
Ganophyllum falcatum	48	-	0.031	0.025	0.010	0.012	-	0.009	-	-	-	0.087
Terminalia catappa	49	-	0.160	0.063	0.027	0.019	-	-	-	-	-	0.269
Milusa tectona	50	-	0.220	0.152	0.084	-	0.009	0.009	-	-	-	0.474
Aglaia andamanica	51	-	0.161	0.113	0.060	0.021	-	-	-	-	-	0.355
Xanthophyllum andamanicum	52	-	0.176	0.117	0.052	0.044	0.009	-	0.009	-	-	0.407
Bischofia javanica	54	-	0.012	-	-	-	-	0.010	-	-	-	0.022
Dillenia pentagyna	55	-	0.172	0.199	0.182	0.106	0.029	0.037	-	-	-	0.725
Artocarpus gomeziana	56	-	0.093	0.021	0.018	0.023	-	-	-	-	-	0.155
Hibiscus tiliaceus	57	-	0.007	-	-	-	-	-	-	-	-	0.007
Others	58	-	10.416	5.246	2.624	1.170	0.389	0.228	0.241	0.046	0.277	20.637
Baccauria sapida	67	-	0.225	0.085	0.038	0.013	-	-	-	-	-	0.361
Diospyros species	68	-	0.516	0.110	0.020	0.011	-	-	-	-	-	0.657
Pterospermum aceroides	69	-	0.633	0.238	0.139	0.010	-	-	-	-	0.103	1.123
Total		-	16.212	8.923	4.978	2.277	0.860	0.481	0.379	0.120	0.641	34.871

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C	G	K	O
D	H	L	P

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Table No. 2.5.0

RESIDUAL WOOD VOLUME (M^3) PER HECTARE BY UTILITY CLASS AND DIAMETER CLASSES

NORTH ANDAMAN STRATUM - TROPICAL RAIN FOREST

UTILITY CLASSES	DIAMETER CLASSES (IN CM.)										
	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100+	Total
Ply wood species	-	3.009	2.930	2.206	1.555	0.896	0.352	0.240	0.176	1.168	12.540
Match wood species	-	0.618	0.622	0.499	0.235	0.118	0.067	0.059	0.021	0.032	2.263
Constructional wood species	-	2.378	2.563	1.860	1.375	0.799	0.450	0.282	0.090	0.201	10.006
Ornamental wood species	-	1.172	0.546	0.498	0.346	0.375	0.308	0.184	0.199	1.911	5.539
Non-commercial woodspecies	-	16.212	8.923	4.970	2.277	0.860	0.481	0.379	0.120	0.641	34.871
TOTAL	-	23.408	15.610	10.046	5.795	3.045	1.660	1.145	0.614	3.955	65.278

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TABLE NO. 2.5.1

SMALL WOOD VOLUME (M^3) PER HECTARE BY SPECIES AND DIAMETER CLASSES (IN CM.) (PLYWOOD SPECIES)

NORTH ANDAMAN

STRATUM - TROPICAL RAIN FOREST

SPECIES NAME	SPECIES CODE	DIAMETER CLASSES (IN CM.)										
		10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total
Dipterocarpus species	1	2.863	0.102	0.147	0.073	0.100	0.865	0.017	0.096	0.140	0.360	3.963
Amoora wallichii	2	0.067	0.005	0.011	0.007	0.008	0.007	0.001	-	-	0.013	0.119
Parishia insignis	3	0.217	0.018	0.039	0.022	0.010	0.014	0.003	0.007	0.007	0.015	0.352
Terminalia bialata	4	0.143	0.010	0.028	0.022	0.025	0.016	0.006	0.015	0.020	0.096	0.381
Terminalia procera	5	0.212	0.041	0.123	0.052	0.048	0.037	0.006	0.009	0.008	0.040	0.576
T O T A L		3.502	0.176	0.348	0.176	0.191	0.139	0.033	0.127	0.175	0.524	5.391

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Table No. 2.5.2

SMALL WOOD VOLUME (M^3) PER HA. BY SPECIES AND DIAMETER CLASSES (MATCH WOOD SPECIES)

NORTH ANDAMAN — STRATUM - TROPICAL RAIN FOREST

SPECIES NAME	SP. CODE	DIAMETER CLASSES (IN CM.) 10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100+	Total
Canarium euphyllum	6	0.133	0.248	0.034	0.038	0.091	0.053	0.024	0.021	0.010	0.008	0.660
Endospermum malaccense	7	0.012	0.028	0.001	0.023	0.009	0.005	0.013	-	-	-	0.091
Anthocaphalus cadamba	8	0.025	0.090	0.013	0.019	0.004	-	-	0.003	-	-	0.154
Salmalia insignis	9	0.038	0.113	0.045	0.065	0.028	0.019	0.003	0.008	0.004	0.005	0.328
Sideroxylon longepetiolatum	10	0.290	0.149	0.040	0.013	0.014	0.008	-	-	-	0.008	0.522
Pteroceymbium tinctorium	11	0.364	0.567	0.294	0.333	0.275	0.099	0.028	0.026	0.005	-	1.991
TOTAL		0.862	1.195	0.427	0.491	0.421	0.184	0.068	0.058	0.019	0.021	3.746

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Table No. 2.5.3

SMALL WOOD VOLUME (M^3) PER HECTARE BY SPECIES AND DIAMETER CLASSES

NORTH ANDAMAN STRATUM - TROPICAL RAIN FOREST (CONSTRUCTIONAL WOOD SPECIES)

SPECIES NAME	SP. CODE	DIAMETER CLASSES (IN CM.) 10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100+	Total
Artocarpus chaplasha	12	0.622	0.342	0.070	0.051	0.041	0.029	0.007	0.021	0.003	0.013	1.199
Artocarpus lakoocha	13	0.549	0.249	0.028	0.014	0.003	0.002	-	-	-	0.001	0.846
Hopea odorata	14	0.063	0.023	0.005	0.004	0.003	-	0.003	-	-	-	0.101
Pajanelia longifolia	15	0.356	0.081	0.014	0.018	0.016	0.003	0.014	-	-	0.005	0.507
Adenanthera pavonina	16	0.090	0.023	0.003	0.004	-	-	-	0.003	-	-	0.123
Planchonia andamanica	17	0.133	0.089	0.024	0.038	0.035	0.018	0.024	0.019	0.004	0.002	0.386
Diplolnema butyracea	18	0.111	0.060	0.022	0.009	0.014	0.018	0.005	0.002	-	-	0.241
Linnea coromandelica	20	0.249	0.259	0.062	0.052	0.032	0.015	0.006	0.007	0.001	-	0.683
Lagerstroemia hypoleuca	21	0.257	0.104	0.012	0.013	0.014	0.013	0.023	0.010	0.007	0.002	0.455
Terminalia manii	22	0.147	0.063	0.013	0.007	0.010	0.014	0.009	0.002	-	0.006	0.271
Calophyllum inophyllum	23	0.001	-	-	-	-	-	-	-	-	-	0.001
Manilkara littoralis	24	0.060	0.016	0.004	0.004	-	-	-	-	-	0.003	0.087
Albizzia lebbek	25	0.079	0.059	0.018	0.018	0.011	0.005	-	0.008	-	-	0.198
TOTAL		2.717	1.368	0.275	0.232	0.179	0.117	0.091	0.072	0.015	0.032	5.098

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Table No. 2.5.4

NORTH ANDAMAN

SMALL WOOD VOLUME (M^3) PER HECTARE BY SPECIES AND DIAMETER CLASSES (ORNAMENTAL WOOD SPECIES)

STRATUM - TROPICAL RAIN FOREST

SPECIES NAME	SP. CODE	DIAMETER CLASSES (IN CM.) 10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total
SAGERAEA ELLIPTICA	27	0.392	0.007	0.002	-	0.002	-	-	-	-	-	0.403
DIOSPYROS MARMORATA	28	0.900	0.031	0.018	0.002	-	0.001	-	-	-	-	0.952
MURRAYA PANICULATA	29	0.005	-	-	-	-	-	-	-	-	-	0.005
PODOCARPUS NERIIFOLIA	30	0.008	0.001	0.001	-	-	-	-	-	-	-	0.010
PTEROCARPUS DALBERGIOIDES	66	0.214	0.029	0.044	0.038	0.042	0.057	0.029	0.097	0.200	0.858	1.608
TOTAL		1.519	0.068	0.065	0.040	0.044	0.058	0.029	0.097	0.200	0.858	2.978

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Table No. 2.5.5

SMALL WOOD VOLUME (M^3) PER HECTARE BY SPECIES AND DIAMETER CLASSES (NON-COMMERCIAL WOOD SPECIES)

NORTH ANDAMAN — STRATUM - TROPICAL RAIN FOREST

SPECIES NAME	SP. CODE	DIAMETER CLASSES (IN CM.) 10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total
MYRISTICA SPECIES	31	2.738	0.453	0.128	0.069	0.017	0.010	0.004	0.002	-	-	3.421
DUABANGA SONNERETIOIDES	32	-	-	-	-	-	-	-	-	-	0.004	0.004
AIBIZZIA STIPULATA	33	0.009	0.004	0.011	0.011	0.005	0.001	0.003	0.002	-	0.003	0.049
MANGIFERA ANDAMANICA	34	0.190	0.027	0.005	0.005	0.004	-	0.002	0.002	-	0.003	0.238
AISTONIA SCHOLARIS	37	0.004	0.001	0.002	0.001	-	-	-	-	-	0.008	0.016
TETRAMELES NUDIFLORA	38	0.074	0.030	0.020	0.032	0.017	0.010	0.019	0.011	0.016	0.040	0.269
PTERYGOTA ALATA	39	0.011	0.001	0.003	0.001	-	-	-	-	-	-	0.016
GMELINA ARBOREA	41	0.004	-	-	0.001	-	-	-	-	-	-	0.005
STERCULIA VILLOSA	42	0.335	0.228	0.088	0.048	0.008	0.005	-	0.002	-	-	0.714
SPONDIAS MANGIFERA	43	0.149	0.068	0.024	0.009	0.001	-	-	0.002	-	-	0.253
NAUCLEA GAG EANA	44	0.097	0.039	0.034	0.009	0.003	0.003	0.001	0.004	0.003	-	0.193
POMETIA PINNATA	45	0.280	0.152	0.083	0.063	0.018	0.015	0.007	0.004	0.003	-	0.625
ANTIARIS TOXICARIA	46	0.040	0.005	0.003	-	-	-	-	-	-	-	0.048
EUGENIA SPECIES	47	0.198	0.062	0.024	0.004	-	0.002	-	-	-	0.011	0.301
GANOPHYLLUM FALCATUM	48	0.031	0.010	0.004	0.002	0.001	-	0.002	-	-	-	0.050
TERMINALIA CATAPPA	49	0.198	0.050	0.010	0.003	0.001	-	-	-	-	-	0.262
MILUSA TECTONA	50	0.217	0.070	0.026	0.012	-	0.001	0.001	-	-	-	0.327
AGLAIA ANDAMANICA	51	0.312	0.051	0.019	0.009	0.001	-	-	-	-	-	0.392
XANTHOPHYLLUM ANDAMANICUM	52	0.147	0.055	0.020	0.007	0.002	0.001	-	0.002	-	-	0.234
BISCHOFIA JAVANICA	54	0.003	0.004	-	-	-	-	0.002	-	-	-	0.009
DILIENIA PENTAGYNA	55	0.086	0.054	0.034	0.027	0.009	0.003	0.007	-	-	-	0.220
ARTOCARPUS GOMEZIANA	56	0.036	0.030	0.003	0.002	0.002	-	-	-	-	-	0.073
HIBISCUS TILIACEUS	57	0.011	0.002	-	-	-	-	-	-	-	-	0.013
OTHERS	58	18.383	3.289	0.875	0.387	0.103	0.042	0.043	0.052	0.013	0.073	23.260
BACCAUREA SAPIDA	67	0.344	0.071	0.014	0.005	0.001	-	-	-	-	-	0.435
DIOSPYROS SPECIES	68	1.479	0.163	0.018	0.003	0.001	-	-	-	-	-	1.664
PTEROSPERMUM ACEROIDES	69	1.036	0.200	0.040	0.020	0.001	-	-	-	-	0.027	1.324
TOTAL		26.412	5.119	1.488	0.730	0.195	0.093	0.091	0.083	0.035	0.169	34.415

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Table No. 2.6.0

SMALL WOOD VOLUME (M^3) PER HECTARE BY UTILITY CLASS AND DIAMETER CLASSES

NORTH ANDAMAN

STRATUM - TROPICAL RAIN FOREST

UTILITY CLASS	DIAMETER CLASSES (IN CM.)										
	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	TOTAL
PLY WOOD SPECIES	3.502	0.176	0.348	0.176	0.101	0.139	0.033	0.127	0.175	0.524	5.391
MATCH WOOD SPECIES	0.862	1.195	0.427	0.491	0.421	0.184	0.068	0.058	0.019	0.021	3.746
CONSTRUCTIONAL WOOD SPECIES	2.717	1.368	0.275	0.232	0.179	0.117	0.091	0.072	0.015	0.032	5.098
ORNAMENTAL WOOD SPECIES	1.519	0.068	0.065	0.040	0.044	0.058	0.029	0.097	0.200	0.858	2.978
NON-COMMERCIAL WOOD SPECIES	26.412	5.119	1.488	0.730	0.195	0.093	0.091	0.083	0.035	0.169	34.415
TOTAL	35.043	7.932	2.603	1.670	1.033	0.594	0.310	0.435	0.445	1.603	51.668

Contents

Table No. 3.1.1

TOTAL VOLUME (IN 000 M^3) BY SPECIES AND DIAMETER CLASSES

NORTH ANDAMAN — STRATUM - TROPICAL RAIN FOREST

SPECIES NAME	SP. CODE	DIAMETER CLASSES (IN CM.) 10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total
DIPTEROCARPUS SPECIES	1	454.005	294.174	274.147	290.064	397.535	291.881	175.387	302.675	277.177	876.813	3633.858
AMOORA WALLICHII	2	10.717	13.356	20.204	26.768	31.679	28.508	8.652	0.000	0.000	33.670	173.554
PARISHIA INSIGNIS	3	34.543	50.697	72.754	85.405	39.956	64.595	29.494	24.520	13.909	36.089	451.962
TERMINALIA BIALATA	4	22.684	28.543	50.744	85.807	99.096	76.704	56.295	45.470	39.451	233.419	738.213
TERMINALIA PROCERA	5	33.696	118.528	229.432	205.046	190.358	169.766	69.170	28.279	17.464	97.482	1159.221
CANARIUM EUPHYLLUM	6	21.238	59.665	33.308	42.227	115.672	100.212	77.925	69.925	40.606	28.950	589.728
ENDOSPERMUM MELACCENSE	7	2.028	6.756	1.749	24.660	10.196	7.362	39.314	0.000	0.000	0.000	92.065
ANTHOCAPHALUS CADAMBA	8	3.967	21.815	12.666	20.134	5.001	0.000	0.000	12.847	0.000	0.000	76.430
SALMALIA INSIGNIS	9	6.046	27.150	43.118	70.974	34.460	35.762	9.336	23.329	14.862	17.870	282.907
SIDEROXYLON LONGEPETIOLATUM	10	46.065	35.892	38.470	14.272	18.906	16.035	0.000	0.000	0.000	26.368	196.008
PTEROCEYMBIUM TINCTORIUM	11	57.831	136.630	281.802	364.844	349.070	182.994	87.305	83.475	18.924	0.000	1562.875
ARTOCARPUS CHAPLASHA	12	98.747	148.762	199.666	163.469	163.636	130.427	32.409	104.046	21.493	126.388	1189.043
ARTOCARPUS LAKOOCHA	13	86.738	107.970	81.148	42.027	8.021	10.818	0.000	0.000	0.000	17.100	353.822
HOPEA ODORATA	14	10.121	10.168	13.357	10.037	10.955	0.000	10.714	0.000	0.000	0.000	65.352
PAJANELIA LONGIFOLIA	15	56.446	35.249	40.539	56.150	64.118	17.996	64.439	0.000	0.000	48.421	383.358
ADENANTHERA PAVONINA	16	14.404	9.920	9.562	10.441	0.000	0.000	0.000	11.971	0.000	0.000	56.298
PLANCHONIA ANDAMANICA	17	21.090	38.745	69.185	120.755	138.617	82.275	112.581	96.973	43.919	18.925	743.065
DIPLOKNEMA BUTYRACEAE	18	17.736	26.119	63.030	29.703	52.398	83.425	23.800	14.839	0.000	0.000	311.050
LANNEA COROMANDELICA	20	39.527	112.534	181.231	164.559	126.024	70.214	29.749	35.792	15.335	0.000	774.965
LAGERSTROEMIA HYPOLEUCA	21	40.889	45.310	32.236	42.800	57.292	58.019	106.925	49.056	74.166	20.782	527.475
TERMINALIA MANII	22	23.442	27.462	37.700	22.989	39.356	64.125	38.573	11.264	0.000	55.907	320.818
CALOPHYLLUM INOPHYLLUM	23	0.198	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.198
MANILKARA LITTORALIS	24	9.562	6.857	11.834	10.386	0.000	0.000	0.000	0.000	0.000	31.329	69.969
ALBIZZIA LEBBEK	25	12.595	25.560	51.146	56.140	43.940	21.934	0.000	37.667	0.000	0.000	248.982
SAGERAEA ELLIPTICA	27	62.291	20.476	3.618	0.000	5.188	0.000	0.000	0.000	0.000	0.000	91.573
DIOSPYROS MARMORATA	28	142.753	90.378	33.169	8.860	0.000	6.384	0.000	0.000	0.000	0.000	281.544
MURRAYA PANICULATA	29	0.853	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.853
PODOCARPUS NERIIFOLIA	30	1.405	1.243	2.279	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.927
MYRISTICA SPECIES	31	434.174	299.397	202.441	158.407	91.146	62.072	19.055	12.996	0.000	0.000	1279.688
DUABANGA SONNERETIOIDES	32	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	26.840	26.840
ALBIZZIA STIPULATA	33	1.439	2.489	17.560	25.776	29.001	7.475	18.803	11.264	0.000	18.935	132.742

Contents

Species Name	Sp. Code	DIAMETER CLASSES (IN CM.) 10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100+	Total
Mangifera andamanica	34	30.269	18.046	8.120	9.975	21.408	0.000	8.652	12.115	0.000	20.033	128.618
Alstonia scholoris	37	0.683	1.021	2.279	3.167	0.000	0.000	0.000	0.000	0.000	54.435	61.585
Tetrameles nudiflora	38	11.888	19.701	31.673	71.597	90.500	65.383	101.781	69.883	88.296	249.250	799.952
Pterygota alata	39	1.862	0.899	3.954	2.878	0.000	0.000	0.000	0.000	0.000	0.000	9.593
Gmelina arborea	41	0.780	0.000	0.000	2.739	0.000	0.000	0.000	0.000	0.000	0.000	3.519
Sterculia villosa	42	53.181	150.760	139.836	107.998	40.730	29.836	0.000	11.971	0.000	0.000	534.312
Spondias mangifera	43	23.697	44.908	39.095	19.554	4.547	0.000	0.000	12.405	0.000	0.000	144.206
Nauclear ga geana	44	15.443	25,656	54.164	20.817	14.014	21.542	8.531	22.674	14.534	0.000	197.375
Pometia pinnata	45	44.388	100.679	132.176	143.477	103.939	99.170	40.852	24.968	15.012	0.000	704.661
Antiaris toxicaria	46	6.484	3.274	5.671	0.000	0.000	0.000	0.000	0.000	0.000	0.000	15.429
Eugenia species	47	31.394	41.128	38.845	9.995	0.000	7.362	0.000	0.000	0.000	67.520	196.244
Ganophyllum falcatum	48	4.983	6.505	6.688	3.547	5.671	0.000	9.527	0.000	0.000	0.000	36.921
Terminalia catappa	49	31.424	33.420	16.771	9.003	8.745	0.000	0.000	0.000	0.000	0.000	99.363
Milusa tectona	50	34.553	46.031	40.361	28.205	0.000	6.176	9.147	0.000	0.000	0.000	164.473
Aglaia andamanica	51	49.592	33.743	29.823	20.211	9.648	0.000	0.000	0.000	0.000	0.000	143.017
Xanthophyllum andamanicum	52	23.437	36.703	30.945	17.431	20.704	6.176	0.000	12.847	0.000	0.000	148.243
Bischofia javanica	54	0.609	2.678	0.000	0.000	0.000	0.000	10.714	0.000	0.000	0.000	14.001
Dillenia pentagyna	55	13.783	35.933	52.712	60.959	49.385	20.116	38.980	0.000	0.000	0.000	271.868
Artocarpus gomeziana	56	5.840	19.617	5.647	5.907	10.672	0.000	0.000	0.000	0.000	0.000	47.683
Hibiscus tiliaceus	57	1.844	1.460	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.305
Others	58	2914.196	2172.561	1386.121	875.923	544.186	268.086	239.099	331.687	72.535	461.868	9266.262
Pterocarpus dalbergioides	66	34.075	84.764	81.603	147.811	163.949	258.007	296.574	306.762	395.053	2089.873	3858.471
Baccaurea sapida	67	54.566	46.991	22.653	12.608	5.871	0.000	0.000	0.000	0.000	0.000	142.689
Diospyros species	68	234.499	107.695	29.147	6.711	5.094	0.000	0.000	0.000	0.000	0.000	383.146
Pterospermum aceroides	69	164.343	132.089	62.975	46.305	4.636	0.000	0.000	0.000	0.000	171.767	582.115
TOTAL		5555.044	4968.107	4329.354	3779.518	3225.320	2370.837	1773.783	1781.700	1162.736	4830.034	33776.433

Contents

Table No. 3.2.1

TOTAL PLY WOOD SPECIES VOLUME (IN '000' M^3) BY SPECIES AND DIAMETER CLASSES

NORTH ANDAMAN

STRATUM - TROPICAL RAIN FOREST

SPECIES NAME	SP. CODE	DIAMETER CLASSES (IN CM.) 10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total
Dipterocarpus species	1	454.005	294.174	274.147	290.064	397.535	291.881	175.387	302.675	277.177	876.813	3633.858
Amoora wallichii	2	10.717	13.356	20.204	26.768	31.679	28.508	8.652	0.000	0.000	33.670	173.554
Parishia insignis	3	34.543	50.697	72.754	85.405	39.956	64.595	29.494	24.520	13.009	36.089	451.962
Terminalia bialata	4	22.684	28.543	50.744	85.807	99.096	76.704	56.295	45.479	39.451	233.419	738.213
Terminalia procera	5	33.696	118.528	229.432	205.046	190.358	169.766	69.170	28.279	17.464	97.482	1159.221
TOTAL		555.645	505.298	647.281	693.090	758.624	631.454	338.998	400.944	348.001	1277.473	6156.808

Contents

Table No. 3.2.2

TOTAL MATCH WOOD SPECIES VOLUME (IN '000'M^3) BY SPECIES AND DIAMETER CLASSES

NORTH ANDAMAN — STRATUM - TROPICAL RAIN FOREST

SPECIES NAME	SP. CODE	DIAMETER CLASSES (in CM.) 10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total
Canarium euphyllum	6	21.238	59.665	33.308	42.227	115.672	100.212	77.925	69.925	40.606	28.950	589.728
Endospermum melaccense	7	2.028	6.756	1.749	24.660	10.196	7.362	39.314	0.000	0.000	0.000	92.065
Anthocephalus cadamba	8	3.967	21.815	12.666	20.134	5.001	0.000	0.000	12.847	0.000	0.000	76.430
Salmalia insignis	9	6.046	27.150	43.118	70.974	34.460	35.762	9.336	23.329	14.862	17.870	282.907
Sideroxylon longepetiolatum	10	46.065	35.892	38.470	14.272	18.906	16.035	0.000	0.000	0.000	26.368	196.008
Pterocymbium tinctorium	11	57.831	136.630	281.802	364.844	349.070	182.994	87.305	83.475	18.924	0.000	1562.875
T O T A L		137.175	287.908	411.113	537.111	533.305	342.365	213.880	189.576	74.392	73.188	2800.013

Contents

TABLE NO. 3.2.3

TOTAL CONSTRUCTIONAL WOOD SPECIES VOLUME (IN '000 M^3) BY SPECIES & DIAMETER CLASSES

NORTH ANDAMAN

STRATUM - TROPICAL RAIN FOREST

SPECIES NAME	SPECIES CODE.	DIAMETER CLASSES (IN CM.) 10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total
Artocarpus chaplasha	12	98.747	148.762	199.666	163.469	163.636	130.427	32.409	104.046	21.493	126.388	1189.043
Artocarpus lakoocha	13	86.738	107.970	81.148	42.027	8.021	10.818	0.000	0.000	0.000	17.100	353.822
Hopea odorata	14	10.121	10.168	13.357	10.037	10.955	0.000	10.714	0.000	0.000	0.000	65.352
Pajanelia longifolia	15	56.446	35.249	40.539	56.150	64.118	17.996	64.439	0.000	0.000	48.421	383.358
Adenanthera pavonina	16	14.404	9.920	9.562	10.441	0.000	0.000	0.000	11.971	0.000	0.000	56.298
Planchonia andamanica	17	21.090	38.745	69.185	120.755	138.617	82.215	112.581	96.973	13.919	18.925	743.065
Diploknema butyracea	18	17.736	26.119	63.030	89.703	52.398	83.425	23.800	14.839	0.000	0.000	311.050
Lannea coromandelica	20	39.527	112.534	181.231	164.559	126.024	70.214	29.749	35.792	15.535	0.000	774.965
Lagerstroemia hypoleuca	21	40.889	45.310	32.236	42.800	57.292	58.019	106.925	49.056	74.166	20.782	527.475
Terminalia manii	22	23.442	27.462	37.700	22.989	39.356	64.125	38.573	11.264	0.000	55.907	320.818
Calophyllum inophyllum	23	0.198	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.198
Manilkara littoralis	24	9.563	6.857	11.834	10.386	0.000	0.000	0.000	0.000	0.000	31.329	69.969
Albizzia lebbek	25	12.595	25.560	51.146	56.140	43.940	21.934	0.000	37.667	0.000	0.000	248.982
T O T A L		431.496	594.656	790.634	729.456	704.357	539.233	419.190	361.608	154.913	318.852	5044.395

Contents

TABLE NO. 3.2.4

TOTAL ORNAMENTAL WOOD SPECIES VOLUME (IN '000 M^3) BY SPECIES & DIAMETER CLASSES

NORTH ANDAMAN

STRATUM - TROPICAL RAIN FOREST

SPECIES NAME	SPECIES CODE	DIAMETER CLASSES (IN CM.) 10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total
Sageraea elliptica	27	62.291	20.476	3.618	0.000	5.188	0.000	0.000	0.000	0.000	0.000	91.573
Diospyros marmorata	28	142.753	90.378	33.169	8.860	0.000	6.384	0.000	0.000	0.000	0.000	281.544
Murraya paniculata	29	0.853	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.853
Podocarpus nerifolia	30	1.405	1.243	2.279	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.927
Pterocarpus dalbergioides	66	34.075	84.764	81.603	147.811	163.949	258.007	296.574	306.762	395.053	2089.873	3858.471
T O T A L		241.377	196.861	120.669	156.671	169.137	264.391	296.574	306.762	395.053	2089.873	4237.368

Contents

Table No.3.2.5

Total Non-Commercial Wood Species Volume('000 m^3) By Species And Diameter Classes

NORTH A NDAMAN — STRATUM - TROPICAL RAIN FOREST

Species Name	Sp. Code.	Diameter Classes (in CM.) 10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100+	Total
Myristica species	31	434.174	299.397	202.441	158.407	91.146	62.072	19.055	12.996	-	-	1279.688
Duabanga sonner tioides	32	-	-	-	-	-	-	-	-	-	26.840	26.840
Albizzia stipulata	33	1.439	2.489	17.560	25.776	29.001	7.475	18.803	11.264	-	18.935	132.742
Mangifera andamanica	34	30.269	18.046	8.120	9.975	21.408	-	8.652	12.115	-	20.033	128.618
Alstonia scholaris	37	0.683	1.021	2.279	3.167	-	-	-	-	-	54.435	61.585
Tetrameles nudiflora	38	11.888	19.701	31.673	71.597	90.500	65.383	101.781	69.883	88.296	249.250	799.952
Pterygota alata	39	1.862	0.899	3.945	2.878	-	-	-	-	-	-	9.593
Gmelina arborea	41	0.780	-	-	2.739	-	-	-	-	-	-	3.519
Sterculia villosa	42	53.181	150.760	139.836	107.968	40.730	29.836	-	11.971	-	-	534.312
Spondias mangifera	43	23.697	44.908	39.095	19.554	4.547	-	-	12.405	-	-	144.206
Nauclea ga geana	44	15.443	25.656	54.164	20.817	14.014	21.542	8.531	22.674	14.534	-	197.375
Pometia pinnata	45	44.388	100.679	132.176	143.477	103.939	99.170	40.852	24.968	15.012	-	704.661
Antiaris toxicaria	46	6.484	3.274	5.671	-	-	-	-	-	-	-	15.429
Eugenia species	47	31.394	41.128	38.845	9.995	-	7.362	-	-	-	67.520	196.244
Ganophyllum falcatum	48	4.983	6.505	6.688	3.547	5.671	0.000	9.527	0.000	0.000	0.000	36.921
Terminalia catappa	49	31.424	33.420	16.771	9.003	8.745	0.000	0.000	0.000	0.000	0.000	99.363
Milusa tectona	50	34.553	46.031	40.361	28.205	0.000	6.176	9.147	0.000	0.000	0.000	164.473
Aglaia andamanica	51	49.592	33.743	29.823	20.211	9.648	0.000	0.000	0.000	0.000	0.000	143.017
Xanthophyllom andamanicum	52	23.437	36.703	30.945	17.431	20.704	6.176	0.000	12.847	0.000	0.000	148.243
Bischofia javanica	54	0.609	2.678	0.000	0.000	0.000	0.000	10.714	0.000	0.000	0.000	14.001
Dillenia pentagyna	55	13.783	35.933	52.712	60.959	49.385	20.116	38.980	0.000	0.000	0.000	271.868
Artocarpus gomeziana	56	5.840	19.617	5.647	5.907	10.672	0.000	0.000	0.000	0.000	0.000	47.683
Hibiscus tiliaceus	57	1.844	1.460	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.305
Others	58	2914.196	2172.561	1386.121	875.923	544.186	268.086	239.099	331.687	72.535	461.868	9266.262
Baccaurea sapida	67	54.566	46.991	22.653	12.608	5.871	0.000	0.000	0.000	0.000	0.000	142.689
Diopyros species	68	234.499	107.695	29.147	6.711	5.094	0.000	0.000	0.000	0.000	0.000	383.146
Pterospermum acoroides	69	164.343	132.089	62.975	46.305	4.636	0.000	0.000	0.000	0.000	171.767	582.115
TOTAL		4189.351	3383.384	2359.657	1663.190	1059.897	593.394	505.141	522.810	190.377	1070.648	15537.850

Contents

Table No. 3.3.1.

TOTAL PLY WOOD VOLUME (IN '000 M^3) BY SPECIES AND DIAMETE CLASSES

NORTH ANDAMAN

STRATUM - TROPICAL RAIN FOREST

SPECIES NAME	Sp. CODE	DIAMETER CLASSES (IN C.M.)										
		10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	TOTAL
Dipterocarpus species	1	-	-	53.459	131.979	252.435	215.992	143.817	258.787	232.829	692.682	1981.980
Amoora wallichii	2	-	-	3.940	12.179	20.116	21.096	7.095	-	-	26.599	91.025
Parishia insignis	3	-	-	14.187	38.859	25.372	47.800	24.185	20.965	11.683	28.510	211.561
Terminalia bialata	4	-	-	9.895	39.042	62.926	56.761	46.162	38.877	33.139	184.401	471.203
Terminalia procera	5	-	-	44.739	93.296	120.877	125.627	56.719	24.178	14.670	77.011	557.117
TOTAL		-	-	126.220	315.355	481.726	467.276	277.978	342.807	292.321	1009.203	3312.886

Contents

Table No. 3.3.2

TOTAL MATCH WOOD VOLUME (IN '000 M^3) BY SPECIES AND DIAMETER CLASS - MATCH WOOD SPECIES

North Andaman

Stratum - Tropical Rain Forest

Species Name	Sp.Code	DIAMETER CLASSES (IN C.M.)										
		10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total
Canarium euphyllum	6	-	-	19.818	29.981	93.116	86.182	70.132	63.072	37.154	25.621	425.076
Endospermum malaccense	7	-	-	1.041	17.509	8.208	6.331	35.383	-	-	-	68.472
Anthocephalus cadamba	8	-	-	7.536	14.295	4.026	-	-	11.588	-	-	37.445
Salmalia insignis	9	-	-	25.655	50.391	27.740	30.755	8.402	21.043	13.599	15.815	193.400
Sideroxylon longepetiolatum	10	-	-	22.890	10.133	15.219	13.790	-	-	-	23.335	85.367
Pteroceymbium tinctorium	11	-	-	167.672	259.039	281.001	157.375	78.575	75.294	17.315	-	1036.271
T O T A L		-	-	244.612	381.348	429.310	294.433	192.492	170.997	68.068	64.771	1846.031

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Table No. 3.3.3.

TOTAL CONSTRUCTIONAL WOOD VOLUME ('000 M^3) BY SPECIES AND DIAMETER CLASSES

NORTH ANDAMAN — STRATUM - TROPICAL RAIN FOREST

SPECIES NAME	SP. CODE	DIAMETER CLASSES (IN C.M.) 10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	TOTAL
Artocarpus chaplasha	12	-	-	85.856	89.091	106.363	95.212	25.798	87.919	19.021	111.727	620.987
Artocarpus lokoocha	13	-	-	34.894	22.905	5.214	8.005	-	-	-	15.116	86.134
Hopea odorata	14	-	-	5.744	5.470	7.121	-	8.528	-	-	-	26.863
Pajanelia longifolia	15	-	-	17.432	30.602	41.677	13.137	51.293	-	-	42.804	196.945
Adenanthera pavonina	16	-	-	4.112	5.690	-	-	-	10.116	-	-	19.918
Planchonia andamanica	17	-	-	29.750	65.812	90.101	60.061	89.615	81.942	38.868	16.730	472.879
Diploknema butyracea	18	-	-	27.103	16.188	34.059	61.735	18.945	12.539	-	-	170.569
Lannea coromandelica	20	-	-	77.929	89.685	81.916	51.256	23.680	30.244	13.572	-	368.282
Lagerstroemia hypoleuca	21	-	-	13.862	23.326	37.240	42.354	85.112	41.452	65.637	18.371	327.354
Terminalia manii	22	-	-	16.211	12.529	25.581	46.811	30.704	9.518	-	49.422	190.776
Calophyllum inophyllum	23	-	-	-	-	-	-	-	-	-	-	-
Manilkara littoralis	24	-	-	5.089	5.660	-	-	-	-	-	27.695	38.444
Albizzia lebbek	25	-	-	21.993	30.596	28.561	16.014	-	31.829	-	-	128.993
T O T A L		-	-	339.975	397.554	457.833	394.585	333.675	305.559	137.098	281.865	2648.144

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Table No. 3.3.4.

TOTAL ORNAMENTAL WOOD VOLUME (IN '000 M^3) BY SPECIES AND DIAMETER CLASSES

NORTH ANDAMAN

STRATUM - TROPICAL RAIN FOREST

SPECIES NAME	SP. CODE	DIAMETER CLASSES (IN C.M.) 10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total
Sageraea elliptica	27	-	-	0.706	-	3.294	-	-	-	-	-	4.000
Diospyros marmorata	28	-	-	6.468	4.031	-	4.724	-	-	-	-	15.223
Murraya paniculata	29	-	-	-	-	-	-	-	-	-	-	-
Podocarpus nerifolia	30	-	-	0.444	-	-	-	-	-	-	-	0.444
Pterocarpus dalbergioides	66	-	-	15.912	67.254	104.108	190.925	243.191	262.281	331.844	1650.999	2866.514
T O T A L		-	-	23.530	71.285	107.402	195.649	243.191	262.281	331.844	1650.999	2886.181

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Table No. 3.3.5

TOTAL NON-COMMERCIAL WOOD VOLUME (IN '000 M^3) BY SPECIES AND DIAMETER CLASSES

NORTH ANDAMAN

Stratum - Tropical Rain Forest

Species Name	Sp. Code	DIAMETER CLASSES (IN C. M.) 10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total
Myristica species	31	-	-	60.732	72.075	57.331	46.244	15.625	11.177	-	-	263.184
Duabanga sonneratioides	32	-	-	-	-	-	-	-	-	-	23.619	23.619
Albizzia stipulata	33	-	-	5.268	11.728	18.242	5.569	15.418	9.685	-	16.663	82.583
Mangifera andamanica	34	-	-	2.436	4.539	13.465	-	7.095	10.419	-	17.629	55.583
Alstonia scholaris	37	-	-	0.684	1.441	-	-	-	-	-	47.903	50.028
Tetrameles nudiflora	38	-	-	9.502	32.577	56.924	48.710	1.460	60.099	76.817	219.310	505.399
Pterygota alata	39	-	-	1.186	1.309	-	-	-	-	-	-	2.495
Gmelina arborea	41	-	-	-	1.246	-	-	-	-	-	-	1.246
Sterculia villosa	42	-	-	41.951	49.139	25.619	22.228	-	10.295	-	-	149.232
Spondias mangifera	43	-	-	11.728	8.897	2.860	-	-	10.668	-	-	34.153
Nauclea gagneana	44	-	-	16.249	9.472	8.815	16.049	6.995	19.499	12.645	-	89.724
Pometia pinnata	45	-	-	39.653	65.282	65.378	73.882	33.498	21.472	13.060	-	312.225
Antiaris toxicaria	46	-	-	1.701	-	-	-	-	-	-	-	1.701
Eugenia species	47	-	-	11.654	4.548	-	5.485	-	-	-	59.418	81.105
Ganophyllum falcatum	48	-	-	2.006	1.614	3.567	-	7.812	-	-	-	14.999
Terminalia catappa	49	-	-	5.031	4.096	5.501	-	-	-	-	-	14.628
Milusa tectona	50	-	-	12.108	12.833	-	4.601	7.501	-	-	-	37.043
Aglaia andamanica	51	-	-	8.947	9.196	6.069	-	-	-	-	-	24.212
Xanthophyllon andamanicum	52	-	-	9.284	7.931	13.023	4.601	-	11.048	-	-	45.887
Bischofia javanica	54	-	-	-	-	-	-	8.785	-	-	-	8.785
Dillenia pentagyna	55	-	-	15.814	27.736	31.063	14.986	31.964	-	-	-	121.563
Artocarpus gomeziana	56	-	-	1.694	2.688	6.713	-	-	-	-	-	11.095
Others	58	-	-	415.836	398.545	342.293	199.724	196.061	285.251	63.105	406.444	2307.259
Baccaurea sapida	67	-	-	6.796	5.737	3.693	-	-	-	-	-	16.226
Diospyros species	68	-	-	8.744	3.053	3.204	-	-	-	-	-	15.001
Pterospermum aceroides	69	-	-	18.892	21.069	2.916	-	-	-	-	151.155	194.032
TOTAL		-	-	707.896	756.751	666.676	442.079	322.214	449.613	165.627	942.141	4545.027

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TABLE NO. 3.4.0

TOTAL VOLUME ('000 M^3) BY UTILITY CLASS AND DIAMETER CLASSES

NORTH ANDAMAN — STRATUM - TROPICAL RAIN FOREST

UTILITY CLASS	DIAMETER CLASSES (IN CM.)										
	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total
PLY WOOD	-	-	126.220	315.355	481.726	467.276	277.970	342.807	292.321	1009.203	3312.886
MATCH WOOD	-	-	244.612	381.348	429.310	294.433	192.492	170.997	68.068	64.771	1846.031
CONSTRUCTIONAL WOOD	-	-	339.975	397.554	457.833	394.585	333.675	305.559	137.098	281.865	2648.144
ORNAMENTAL WOOD	-	-	23.530	71.285	107.402	195.649	243.191	262.281	331.844	1650.999	2886.181
NON-COMMERCIAL WOOD	-	-	707.896	756.751	666.676	442.079	332.214	449.613	165.627	942.141	4545.027

Contents

TABLE NO. 3.4.1

TOTAL RESIDUAL WOOD VOLUME (IN '000 M^3) BY SPECIES & DIAMETER CLASSES (PLYWOOD SPECIES)

NORTH ANDAMAN

STRATUM - TROPICAL RAIN FOREST

SPECIES NAME	SPECIES CODE	DIAMETER CLASSES (IN CM.)										
		10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total
Dipterocarpus species	1	-	277.994	197.386	146.482	129.199	65.673	28.939	28.754	22.174	127.138	1023.739
Amoora wallichii	2	-	17.621	14.547	13.518	10.296	6.414	1.427	-	- -	4.882	63.705
Parishia insignis	3	-	47.909	52.383	43.130	12.986	14.534	4.867	2.329	1.113	5.233	184.484
Terminalia bialata	4	-	26.973	36.535	43.332	32.206	17.259	9.289	4.320	3.156	33.846	206.916
Terminalia procera	5	-	112.009	165.191	103.548	61.866	38.197	11.413	2.686	1.397	14.135	510.442
T O T A L		-	477.506	466.042	350.010	246.553	142.077	55.935	38.089	27.840	185.234	1989.286

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TABLE NO. 3.4.2

TOTAL RESIDUAL WOOD VOLUME (IN '000 M^3) BY SPECIES & DIAMETER CLASSES (MATCHWOOD SPECIES)

NORTH ANDAMAN

STRATUM-TROPICAL RAIN FOREST

SPECIES NAME	SPECIES CODE	DIAMETER CLASSES (IN CM.) 10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total
Canarium euphyllum	6	-	20.346	7.994	6.123	8.097	5.512	3.896	3.426	1.868	2.026	59.288
Endospermum melaccense	7	-	2.304	0.420	3.576	0.714	0.405	1.966	-	-	-	9.385
Anthocephalus cadamba	8	-	7.439	3.040	2.919	0.350	-	-	0.630	-	-	14.378
Salmalia insignis	9	-	9.258	10.348	10.291	2.412	1.967	0.467	1.143	0.684	1.251	37.821
Sideroxylon longepetiolatum	10	-	12.239	9.233	2.069	1.323	0.882	-	-	-	1.846	27.592
Pteroceymbium tinctorium	11	-	46.591	67.632	52.903	24.435	10.064	4.365	4.090	0.870	-	210.950
T O T A L		-	98.177	98.667	77.881	37.331	18.830	10.694	9.289	3.422	5.123	359.414

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TABLE NO. 3.4.3

TOTAL RESIDUAL WOOD VOLUME ('000 M^3) BY SPECIES AND DIAMETER CLASSES(CONSTRUCTIONAL WOOD SPECIES)

NORTH ANDAMAN

STRATUM - TROPICAL RAIN FOREST

SPECIES NAME	SPECIES CODE	DIAMETER CLASSES (IN CM.) 10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total
Artocarpus chaplasha	12		94.464	102.828	66.205	50.727	30.650	5.510	12.902	2.149	12.639	378.074
Artocarpus lakoocha	13	-	68.561	41.791	17.021	2.487	2.434	-	-	-	1.710	134.004
Hopea odorata	14	-	6.457	6.879	4.065	3.396	-	1.821	-	-	-	26.847
Pajanelia longifolia	15	-	22.383	20.878	22.741	19.877	4.229	10.255	-	-	4.342	101.676
Adenanthera pavonina	16	-	6.299	4.924	4.229	-	-	-	1.484	-	-	36.271
Planchonia andamanica	17	-	24.603	35.630	48.906	42.971	19.335	19.139	12.025	1.392	1.892	208.329
Diploknema butyracea	18	-	16.586	32.461	12.030	16.243	18.771	4.046	1.840	-	-	99.706
Linnea coromandelica	20	-	71.459	93.334	66.646	39.067	16.500	5.057	4.438	1.533	-	295.169
Lagerstroemia hypoleuca	21	-	28.772	16.602	17.334	17.761	13.635	18.177	6.083	7.417	2.078	129.293
Terminalia manii	22	-	17.438	19.416	9.311	12.200	15.069	6.557	1.397	-	5.591	71.910
Manilkara littoralis	24	-	4.354	6.095	4.206	-	-	-	-	-	3.133	17.788
Albizzia lebbek	25	-	16.231	26.340	22.737	13.621	5.155	-	4.671	-	-	88.755
T O T A L		-	377.607	407.178	295.431	218.350	125.778	71.262	44.840	15.491	31.885	1587.822

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TABLE NO. 3.4.4

TOTAL RESIDUAL WOOD VOLUME (IN '000 M^3) BY SPECIES & DIAMETER CLASSES
(ORNAMENTAL WOOD SPECIES)

NORTH ANDAMAN

STRATUM - TROPICAL RAIN FOREST

SPECIES NAME	SPECIES CODE	DIAMETER CLASSES (IN CM.) 10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total
Sageraea elliptica	27	-	19.350	2.605	-	1.686	-	-	-	-	-	23.641
Diospyros marmorata	28	-	85.407	23.882	4.474	-	1.436	-	-	-	-	115.199
Podocarpus nerifolia	30	-	1.174	1.641	-	-	-	-	-	-	-	2.815
Pterocarpus dalbergioides	66	-	80.102	58.754	74.645	53.283	58.052	48.935	29.142	31.604	303.031	737.548
TOTAL		-	186.033	86.882	79.119	54.969	59.488	48.935	29.142	31.604	303.031	879.203

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TABLE NO. 3.4.5

TOTAL RESIDUAL WOOD VOLUME ('000 M^3) BY SPECIES AND DIAMETER CLASSES (NON-COMMERCIAL WOOD SPECIES)

NORTH ANDAMAN — STRATUM - TROPICAL RAIN FOREST

SPECIES NAME	SPECIES CODE	DIAMETER CLASSES (IN CM.)										
		10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total
Myristica species	31	-	227.542	121.465	75.243	31.081	14.277	2.877	1.494	-	-	473.979
Duabanga sonneretioides	32	-	-	-	-	-	-	-	-	-	2.550	2.550
Albizzia stipulata	33	-	1.892	10.536	12.244	9.889	1.719	2.839	1.295	-	1.799	42.213
Mangifera andamanica	34	-	13.715	4.872	4.737	7.300	-	1.306	1.393	-	1.903	35.226
Alstonia scholaris	37	-	0.776	1.367	1.504	-	-	-	-	-	5.171	8.818
Tetrameles nudiflora	38	-	14.973	19.004	34.009	30.861	15.038	15.369	8.036	8.830	23.679	169.799
Pterygota alata	39	-	0.683	2.372	1.367	-	-	-	-	-	-	4.422
Gmelina arborea	41	-	-	-	1.301	-	-	-	-	-	-	1.301
Sterculia villosa	42	-	114.578	83.902	51.299	13.889	6.862	-	1.377	-	-	271.907
Spondias mangifera	43	-	34.130	23.457	9.288	1.551	-	-	1.427	-	-	69.853
Nauclea gag eana	44	-	19.499	32.498	9.888	4.779	4.955	1.288	2.607	1.453	-	76.967
Pometia pinnata	45	-	76.516	79.306	68.152	35.443	22.809	6.169	2.871	1.501	-	292.767
Antiaria toxicaria	46	-	2.488	3.403	-	-	-	-	-	-	-	5.891
Eugenia species	47	-	31.257	23.307	4.747	-	1.693	-	-	-	6.414	67.418
Ganophyllum falcatum	48	-	4.944	4.013	1.685	1.934	-	1.439	-	-	-	14.015
Terminalia catappa	49	-	25.399	10.063	4.276	2.982	-	-	-	-	-	42.720
Milusa tectona	50	-	34.984	24.217	13.397	-	1.421	1.381	-	-	-	75.400
Aglaia andamanica	51	-	25.645	17.894	9.600	3.290	-	-	-	-	-	56.429
Xanthophyllun andamanicum	52	-	27.894	18.567	8.280	7.060	1.421	-	1.477	-	-	64.699
Bischofia javanica	54	-	2.035	-	-	-	-	1.618	-	-	-	3.653
Dillenia pentagyna	55	-	27.309	31.627	28.955	16.840	4.627	5.886	-	-	-	115.244
Artocarpus gomeziana	56	-	14.909	3.388	2.806	3.639	-	-	-	-	-	24.742
Hibiscus tilliaceus	57	-	1.110	-	-	-	-	-	-	-	-	1.110
Others	58	-	1651.146	831.673	416.063	185.567	61.660	36.104	38.144	7.253	43.877	3271.487
Baccaurea sapida	67	-	35.713	13.592	5.989	2.002	-	-	-	-	-	57.296
Diospyros species	68	-	81.848	17.488	3.188	1.737	-	-	-	-	-	104.261
Pterospermum aceroides	69	-	100.388	37.785	21.995	1.581	-	-	-	-	16.318	178.067
T O T A L		-	2571.373	1415.796	790.013	361.425	136.432	76.276	60.121	19.037	101.711	5532.231

Contents

TABLE NO. 3.5.0

TOTAL RESIDUAL WOOD VOLUME ('000 M^3) BY UTILITY & DIAMETER CLASSES

NORTH ANDAMAN — STRATUM - TROPICAL RAIN FOREST

UTILITY CLASS	DIAMETER CLASSES (IN CM.)										
	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total
Plywood species	-	477.506	466.042	350.010	246.553	142.077	55.935	38.089	27.840	185.234	1989.286
Match wood species	-	98.177	98.667	77.881	37.331	18.830	10.694	9.289	3.422	5.123	359.414
Constructional wood species	-	377.607	407.178	295.431	218.350	125.778	71.262	44.840	15.491	31.885	1587.822
Ornamental wood species	-	186.033	86.882	79.119	54.969	59.488	48.935	29.142	31.604	303.031	879.203
Non-commercial wood species	-	2571.373	1415.796	790.013	361.425	136.482	76.276	60.121	19.037	101.711	5532.234
T O T A L	-	3710.696	2474.565	1592.454	918.628	482.655	263.102	181.481	97.394	626.984	10347.959

Contents

TABLE NO. 3.5.1

TOTAL SMALL WOOD VOLUME (IN '000 M^3) BY SPECIES & DIAMETER CLASSES
(PLYWOOD SPECIES)

NORTH ANDAMAN

STRATUM - TROPICAL RAIN FOREST

SPECIES NAME	SPECIES CODE.	DIAMETER CLASSES (IN CM.) 10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total
Dipterocarpus species	1	454.005	16.180	23.302	11.603	15.901	10.216	2.631	15.134	22.174	56.993	628.139
Amoora wallichii	2	10.717	0.735	1.717	1.071	1.267	0.998	0.130	-	-	2.189	18.824
Parishia insignis	3	34.543	2.788	6.184	3.416	1.598	2.261	0.442	1.226	1.113	2.346	55.917
Terminalia bialata	4	22.684	1.570	4.314	3.433	3.964	2.684	0.844	2.273	3.156	15.172	60.094
Terminalia procera	5	33.696	6.519	19.502	8.202	7.615	5.942	1.038	1.415	1.397	6.336	91.662
T O T A L		555.645	27.792	55.019	27.725	30.345	22.101	5.085	20,048	27.840	83.036	854.636

Contents

TABLE NO. 3.5.2

TOTAL SMALL WOOD VOLUME ('000 M^3) BY SPECIES & DIAMETER CLASSES
(MATCH WOOD SPECIES)

NORTH ANDAMAN

STRATUM - TROPICAL RAIN FOREST

SPECIES NAME	SPECIES CODE	DIAMETER CLASSES (IN CM.)										
		10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total
Canarium euphyllum	6	21.238	39.319	5.496	6.123	14.459	8.518	3.897	3.427	1.584	1.303	105.364
Endospermum melaccense	7	2.028	4.452	0.288	3.575	1.274	0.626	1.965	-	-	-	14.208
Anthocephalus cadamba	8	3.967	14.376	2.090	2.920	0.625	-	-	0.629	-	-	24.607
Salmalia insignis	9	6.046	17.892	7.115	10.292	4.308	3.040	0.467	1.143	0.579	0.804	51.686
Sideroxylon longepetiolatum	10	46.065	23.653	6.347	2.070	2.364	1.363	-	-	-	1.187	83.049
Pteroceymbium tinctorium	11	57.831	90.039	46.498	52.902	43.634	15.555	4.365	4.091	0.739	-	315.654
T O T A L		137.175	189.731	67.834	77.882	66.664	29.102	10.694	9.290	2.902	3.294	594.568

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TABLE NO. 3.5.3

TOTAL WOOD VOLUME ('000 M^3) BY SPECIES & DIAMETER CLASSES
(CONSTRUCTIONAL WOOD SPECIES)

NORTH ANDAMAN

STRATUM - TROPICAL RAIN FOREST

SPECIES NAME	SPECIES CODE.	DIAMETER CLASSES (IN CM.) 10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total
Artocarpus chaplasha	12	98.747	54.298	10.982	8.173	6.546	4.565	1.101	3.225	0.323	2.022	189.982
Artocarpus lakoocha	13	86.738	39.409	4.463	2.101	0.320	0.379	-	-	-	0.274	133.684
Hopea odorata	14	10.121	3.711	0.734	0.502	0.438	-	0.365	-	-	-	15.871
Pajanelia longifolia	15	56.446	12.866	2.229	2.807	2.564	0.630	2.191	-	-	0.775	80.508
Adenanthera pavonina	16	14.404	3.621	0.526	0.522	-	-	-	0.371	-	-	19.444
Planchonia andamanica	17	21.090	14.142	3.805	6.037	5.545	2.879	3.827	3.006	0.659	0.303	61.293
Diploknema butyracea	18	17.736	9.533	3.466	1.485	2.096	2.919	0.609	0.460	-	-	38.504
Linnea coromandelica	20	39.527	41.075	9.968	8.228	5.041	2.458	1.012	1.110	0.230	-	108.649
Lagerstroemia hypoleuca	21	40.889	16.538	1.772	2.140	2.291	2.030	3.636	1.521	1.112	0.333	72.262
Terminalia manii	22	23.442	10.024	2.073	1.149	1.575	2.245	1.312	0.349	-	0.894	43.063
Calophyllum inophyllum	23	0.198	-	-	-	-	-	-	-	-	-	0.198
Manilkara littoralis	24	9.563	2.503	0.650	0.520	-	-	-	-	-	0.501	13.737
Albizzia lebbek	25	12.595	9.329	2.813	2.807	1.758	0.765	-	1.167	-	-	31.234
T O T A L		431.496	217.049	43.481	36.471	28.174	18.870	14.253	11.209	2.324	5.102	808.429

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TABLE NO. 3.5.4

TOTAL SMALL WOOD VOLUME (IN '000 M^3) BY SPECIES AND DIAMETER CLASSES
(ORNAMENTAL WOOD SPECIES)

NORTH ANDAMAN

STRATUM - TROPICAL RAIN FOREST

SPECIES NAME	SPECIES CODE.	DIAMETER CLASSES (IN CM.) 10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total
Sageraea elliptica	27	62.291	1.126	0.307	-	0.208	-	-	-	-	-	63.932
Diospyros marmorata	28	142.753	4.971	2.819	0.355	-	0.224	-	-	-	-	151.122
Murraya paniculata	29	0.853	-	-	-	-	-	-	-	-	-	0.853
Podocarpus nerifolia	30	1.405	0.069	0.194	-	-	-	-	-	-	-	1.668
Pterocarpus dalbergioides	66	34.075	4.662	6.937	5.912	6.558	9.030	4.448	15.339	31.605	135.843	254.409
T O T A L		241.377	10.828	10.257	6.267	6.766	9.254	4.448	15.339	31.605	135.843	471.984

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TABLE NO. 3.5.5

TOTAL SMALL WOOD VOLUME ('000 M^3) BY SPECIES & DIAMETER CLASSES (NON-COMMERCIAL WOOD SPECIES)

NORTH ANDAMAN — STRATUM - TROPICAL RAIN FOREST

SPECIES NAME	SPECIES CODE	DIAMETER CLASSES (IN CM.) 10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total
Myristica species	31	434.174	71.855	20.244	11.089	2.734	1.551	0.553	0.325	-	-	542.525
Duabanga sonneretioides	32	-	-	-	-	-	-	-	-	-	0.671	0.671
Albizzia stipulata	33	1.439	0.597	1.756	1.804	0.870	0.187	0.546	0.284	-	0.473	7.956
Mangifera andamanica	34	30.269	4.331	0.812	0.699	0.643	-	0.251	0.303	-	0.501	37.809
Alstonia scholaris	37	0.683	0.245	0.228	0.222	-	-	-	-	-	1.361	2.739
Tetrameles nudiflora	38	11.888	4.728	3.167	5.011	2.715	1.635	2.952	1.748	2.649	6.231	42.724
Pterygota alata	39	1.862	0.216	0.396	0.202	-	-	-	-	-	-	2.676
Gmelina arborea	41	0.780	-	-	0.192	-	-	-	-	-	-	0.972
Sterculia villosa	42	53.181	36.182	13.983	7.560	1.222	0.746	-	0.299	-	-	113.173
Spondias mangifera	43	23.697	10.778	3.910	1.369	0.136	-	-	0.310	-	-	40.200
Nauclea gag eana	44	15.443	6.157	5.417	1.457	0.420	0.538	0.248	0.568	0.436	-	30.684
Pometia pinnata	45	44.388	24.163	13.217	10.043	3.118	2.479	1.185	0.625	0.451	-	99.669
Antiaris toxicaria	46	6.484	0.786	0.567	-	-	-	-	-	-	-	7.837
Eugenia species	47	31.394	9.871	3.884	0.700	-	0.184	-	-	-	1.688	47.721
Ganophyllum falcatum	48	4.983	1.561	0.669	0.248	0.170	-	0.276	-	-	-	7.907
Terminalia catappa	49	31.424	8.021	1.677	0.631	0.262	-	-	-	-	-	42.015
Milusa tectona	50	34.553	11.047	4.036	1.975	-	0.154	0.265	-	-	-	52.030
Aglaia andamanica	51	49.592	8.098	2.982	1.415	0.289	-	-	-	-	-	62.376
Xanthophyllum andamanicum	52	23.437	8.809	3.094	1.220	0.621	0.154	-	0.322	-	-	37.657
Bischofia javanica	54	0.609	0.643	-	-	-	-	0.311	-	-	-	1.563
Dillenia pentagyna	55	13.783	8.624	5.271	4.268	1.482	0.503	1.130	-	-	-	35.061
Artocarpus gomeziana	56	5.840	4.708	0.565	0.413	0.320	-	-	-	-	-	11.846
Hibiscus tiliaceus	57	1.844	0.350	-	-	-	-	-	-	-	-	2.194
Others	58	2914.196	521.415	138.612	61.315	16.326	6.702	6.934	8.292	2.177	11.548	3687.517
Baccaurea sapida	67	54.566	11.278	2.265	0.882	0.176	-	-	-	-	-	69.167
Diospyros species	68	234.499	25.847	2.915	0.470	0.153	-	-	-	-	-	263.884
Pterospermum aceroides	69	164.343	31.701	6.298	3.241	0.139	-	-	-	-	4.294	210.016
T O T A L		4189.351	812.011	235.965	116.426	31.796	14.833	14.651	13.076	5.713	26.767	5460.589

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TABLE NO. 3.6.0

TOTAL SMALL WOOD VOLUME ('000 M^3) BY UTILITY & DIAMETER CLASSES

NORTH ANDAMAN

STRATUM - TROPICAL RAIN FOREST

UTILITY CLASS	DIAMETER CLASSES (IN CM.)										
	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total
Plywood species	555.645	27.792	55.019	27.725	30.345	22.101	5.085	20.048	27.840	83.036	854.636
Match wood species	137.175	189.731	67.834	77.882	66.664	29.102	10.694	9.290	2.902	3.294	594.568
Constructional wood species	431.496	217.049	43.481	36.471	28.174	18.870	14.253	11.209	2.324	5.102	808.429
Ornamental wood species	241.377	10.828	10.257	6.267	6.766	9.254	4.448	15.339	31.605	135.843	471.984
Non-commercial wood species	4189.351	812.011	235.965	116.426	31.796	14.833	14.651	13.076	5.713	26.767	5460.589
T O T A L	5555.044	1257.411	412.556	264.771	163.745	94.160	49.131	68.962	70.384	254.042	8190.206

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TABLE NO. 4.1

VOLUME (M^3) PER HECTARE BY SPECIES & DIAMETER CLASSES

NORTH ANDAMAN

STRATUM - MANGROVE

SPECIES NAME	SPECIES CODE	DIAMETER CLASSES (IN CM.) 4-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total
Rhizophora candelaris	59	7.856	22.895	7.441	0.811	-	-	-	-	-	-	-	38.403
Bruguiera conjugata	61	1.223	16.258	32.323	12.766	4.188	0.772	0.733	-	-	-	-	68.263
Bruguiera perviflora	62	-	0.104	0.181	0.096	0.167	-	-	-	-	-	-	0.548
Avicennia officinalis	63	1.088	1.515	0.381	0.183	-	-	-	-	-	-	-	3.167
Heritiera littoralis	64	0.020	0.127	-	-	-	-	-	-	-	-	-	0.147
Others (Mangrove)	65	0.157	1.484	0.889	0.460	0.437	-	-	1.154	-	-	-	4.581
T O T A L		9.744	42.383	41.215	14.316	4.792	0.772	0.733	1.154	-	-	-	115.109

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TABLE NO. 4.1.1

TOTAL VOLUME (IN '000 M^3) BY SPECIES AND DIAMETER CLASSES

NORTH ANDAMAN

STRATUM - MANGROVE

SPECIES NAME	SPECIES CODE	DIAMETER CLASSES (IN CM.) 4-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total
Rhizophora candelaris	59	212.267	669.770	217.679	23.725	-	-	-	-	-	-	-	1123.441
Bruguiera conjugata	61	35.778	475.612	945.577	373.457	122.516	22.584	21.443	-	-	-	-	1196.967
Bruguiera perviflora	62	-	3.042	5.295	2.808	4.885	-	-	-	-	-	-	16.030
Avicennia officinalis	63	31.828	44.320	11.146	5.353	-	-	-	-	-	-	-	92.647
Heritiera littoralis	64	0.585	3.715	-	-	-	-	-	-	-	-	-	4.300
Others (Mangrove)	65	4.593	43.413	26.007	13.457	12.784	-	-	33.759	-	-	-	134.013
T O T A L		285.051	1239.872	1205.704	418.800	140.185	22.584	21.443	33.759	-	-	-	3367.398

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Table No. 5.1

VOLUME TABLE

Diameter class (in cm.)	Pterocarpus sp.	Terminalia bialata	Terminalia procera	Canarium euphyllum	Sideroxylon lanceolatum	Pterocymbium tinctorium.	Artocarpus lakoocha.	Pagaenelia longifolia.	Planchonia andamanica	Diplokema butyracea.	Manilkara littoralis	Others
10-19	0.370	0.265	0.103	0.124	0.194	0.103	0.265	0.384	0.161	0.272	0.103	0.157
20-29	0.564	0.557	0.441	0.487	0.498	0.378	0.462	0.515	0.460	0.675	0.334	0.457
30-39	0.974	0.986	0.991	1.073	0.898	0.890	0.781	0.835	0.914	1.258	0.708	0.910
40-49	1.600	1.594	1.747	1.883	1.385	1.673	1.222	1.498	1.520	2.021	1.227	1.518
50-59	2.443	2.421	2.704	2.916	1.974	2.739	1.784	2.560	2.281	2.964	1.889	2.279
60-69	3.501	3.509	3.856	4.172	2.703	4.073	2.469	3.983	3.195	4.087	2.695	3.194
70-79	4.775	4.900	5.198	5.653	3.633	5.640	3.275	5.631	4.262	5.390	3.644	4.262
80-89	6.265	6.635	6.724	7.356	4.853	7.377	4.203	7.273	5.483	6.873	4.738	5.485
90-99	7.971	8.756	8.430	9.283	6.471	9.199	5.253	8.583	6.858	8.536	5.975	6.861
100 +	9.894	11.303	10.310	11.434	8.623	10.998	6.424	9.137	8.386	10.379	7.356	8.391

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