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

REPORT  
ON  
FOREST RESOURCES OF  
**LITTLE ANDAMAN**

76-77



**FOREST SURVEY OF INDIA**  
**DEHRA DUN**  
1981

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(DEPARTMENT OF AGRICULTURE AND COOPERATION)

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## C O N T E N T S

	<u>Para</u>	<u>Page No.</u>
Preface	-	-
Preamble	-	-
Introduction	-	1
Background Information	-	1
<u>CHAPTER-I - General</u>		
Name of the area	1.1	<u>3</u>
Location	1.2	3
Factors of locality	1.3	3
Physical features	1.4	3
Terrain, in Little Andaman	1.4.1	4
Geology, Rock and soil	1.5	5
Humus	1.5.1	5
Climate	1.6	6
Climate chart	1.6.1	6
Rainfall	1.6.2	6
Annual rainfall	1.6.3	7
Rainfall data of Little Andaman from 1969 to 1977	1.6.4	7
Cyclone	1.7	7
Water supply	1.8	7
Natural Resources	1.9	8
Land use	1.10	9
Slope classification	1.11	9
Topography, classification and forest strata	1.12	9
Vegetation	1.13	9
Legal status	1.14	10
Demarcation	1.15	10
Forest settlement	1.16	11
Socio-economic condition	1.17	11
Infrastructure based	1.18	11
Detail of wood-based industries of Andaman Islands	1.19	12
Local demand	1.20	13
The future possibilities	1.21	13
Maps	1.22	13
Photographs	1.23	14

	<u>Para</u>	<u>Page No.</u>
<u>CHAPTER-II - RESOURCES BASE</u>		
Objectives	2.1	15
Definition for different categories of timber	2.1.1	15
Definition for other terms	2.1.2	16
Area statement	2.2	<u>16</u>
Forest Types	2.3	17
Southern Tropical Wet Evergreen Forest	2.3.1(a)	17
Andaman Tropical Evergreen Forest	2.3.1(b)	18
Andaman Semi-evergreen Forest	2.3.2	18
Andaman Moist Deciduous Forest	2.3.3	19
Littoral Forest	2.3.4	<u>19</u>
Mangrove Forest	2.3.5	<u>20</u>
Myristica Swamp Forest	2.3.6	20
Bamboo Brakes	2.3.7	21
Cane Brakes	2.3.8	21
Distribution of Forest Resources	2.4	21
Total No. of stems	2.4.1	23
Inventory Design	2.5	25
Size, Number and Location of plots	2.5.1	25
Field work	2.6	26
Data processing	2.7	26
Felled tree volume	2.7.1	27
Cull volume	2.7.2	29
Bark volume	2.7.3	29
<del>General volume equations</del>	<del>2.7.4</del>	<del>29</del>
Local volume equations	2.7.5	31
Tree volume and plot volume	2.7.6	32
Estimation of error	2.7.7	32
Growing stock	2.7.8(a)	32
Utility class-wise	2.7.8(b)	33
<u>CHAPTER-III - MARKET STUDY AND CONSUMPTION PATTERN</u>		
Marketing.	3.0	34
Demand zone	3.1	34
Future Demand Trend	3.2	35
The supply	3.3	36
Consumption pattern	3.4	37

	<u>Para</u>	<u>Page</u> <u>No.</u>
<u>CHAPTER - IV - MANAGEMENT OPPORTUNITIES &amp; POTENTIAL ANNUAL CUT.</u>		
Forest Management	4.0	39
Regeneration	4.1	39
Growth statistics	4.2	40
Rotation and conversion period	4.3	41
Potential annual cut and annual yield	4.4	41
Annual cut	4.4.1	41
Annual yield	4.4.2	42
<u>CHAPTER-V - WOOD BALANCE</u>		
Local Consumption	5.1	44
Commitment to industries	5.2	44
Net wood balance	5.3	44
<u>CHAPTER-VI - ECONOMIC AVAILABILITY AND COST OF RAW MATERIAL DELIVERY.</u>		
Why cost studies	6.1	46
Objectives	6.2	46
Logging operations	6.3	46
Cost of felling, logging etc.	6.4	47
Transportation	6.5	48
Shipping and movement of logs	6.6	48
Schedule of rates	6.7	49
<u>CHAPTER-VII - DEVELOPMENT OF ROADS</u>		
Communication	7.0	53
Evaluation of ports and infrastructure facilities and over all findings.	7.1	53
Planning for new roads	7.2	54
Roads existing in the area	7.3	54
Estimate of formation and maintenance cost	7.4	54
<u>CHAPTER - VIII - SCOPE OF FOREST BASED INDUSTRIAL DEVELOPMENT ASSESSMENT OF INVESTMENT AND REQUIREMENTS AND DEVELOPMENT OPPORTUNITIES.</u>		
Industrial investigations and possibilities	8.1	55
<u>CHAPTER - IX - RESOURCES OF FOUR PRINCIPAL ANDAMAN FOREST DIVISIONS - A COMPARATIVE STUDY.</u>		
	-	57

LIST OF TABLE CONTENTS

STRATUM - EVERGREEN

	<u>Para</u>	<u>Page No.</u>
Stems per hectare by species & diameter classes for Plywood species.	1.1	67
Stems per hectare by species & diameter classes for Match wood species.	1.2	67
Stems per hectare by species & diameter classes for Constructional wood species.	1.3	68
Stems per hectare by species & diameter classes for Ornamental wood species.	1.4	68
Stems per hectare by species & diameter classes for Non-commercial wood species.	1.5	69

STRATUM - LITTORAL

Stems per hectare by species & diameter classes for Plywood species.	1.6	70
Stems per hectare by species & diameter classes for Matchwood species.	1.7	70
Stems per hectare by species & diameter classes for Constructional wood species.	1.8	71
Stems per hectare by species & diameter classes for Ornamental wood species.	1.9	71
Stems per hectare by species & diameter classes for Non-commercial wood species.	1.10	72

STRATUM - DECIDUOUS

Stems per hectare by species & diameter classes for Plywood species.	1.11	73
Stems per hectare by species & diameter classes for Match wood species.	1.12	73
Stems per hectare by species & diameter classes for Constructional wood species.	1.13	74
Stems per hectare by species & diameter classes for Ornamental wood species.	1.14	74
Stems per hectare by species & diameter classes for Non-commercial wood species.	1.15	75

STRATUM - EVERGREEN (IN '000 UNITS)

Total stems by species & diameter classes for Plywood species.	2.1	76
Total stems by species & diameter classes for Matchwood species.	2.2	76
Total stems by species & diameter classes for Constructional wood species.	2.3	77
Total stems by species & diameter classes for Ornamental wood species.	2.4	77
Total stems by species & diameter classes for Non-commercial wood species.	2.5	78

/wood

- STRATUM - LITTORAL ( IN '000 UNITS)

Palau Stem

Total stems by species & diameter classes for Plywood species	2.6	79
Total stems by species & diameter classes for Matchwood species.	2.7	79
Total stems by species & diameter classes for Constructional wood species.	2.8	80
Total stems by species & diameter classes for Ornamental wood species.	2.9	80
Total stems by species & diameter classes for Non-commercial wood species.	2.10	81

STRATUM - DECIDUOUS (IN ' 000 UNITS)

Palau Stem

wood

Total stems by species & diameter classes for Plywood species.	2.11	82
Total stems by species & diameter classes for Matchwood species.	2.12	82
Total stems by species & diameter classes for Constructional wood species.	2.13	83
Total stems by species & diameter classes for Ornamental wood species.	2.14	83
Total stems by species & diameter classes for Non-commercial species.	2.15	84
Total stems by species and diameter classes(in'000 units) for stratum Evergreen.	3.1	85
Total stems by species and diameter classes(in'000 units) for Stratum Littoral.	3.2	87
Total stems by species and diameter classes(in'000 units) for Stratum Deciduous.	3.3	89

STRATUM - EVERGREEN (IN M<sup>3</sup>)

vol/ha.

Volume/ha. by species and diameter classes for Plywood species.	4.1	91
Volume/ha. by species and diameter classes for Matchwood species.	4.2	91
Volume/ha. by species and diameter classes for Constructional wood species	4.3	92
Volume/ha. by species and diameter classes for Ornamental wood species.	4.4	92
Volume/ha. by species and diameter classes for Non-commercial wood species.	4.5	93

STRATUM - LITTORAL ( IN M<sup>3</sup> )

	<u>Para</u>	<u>Page No.</u>
Volume/ha. by species and diameter classes for Plywood species.	4.6	94
Volume/ha. by species and diameter classes for Matchwood species.	4.7	94
Volume/ha. by species and diameter classes for Constructional wood species.	4.8	95
Volume/ha. by species and diameter classes for Ornamental wood species.	4.9	95
Volume/ha. by species and diameter classes for Non-commercial wood species.	4.10	96

STRATUM - DECIDUOUS ( IN M<sup>3</sup> )

Volume/ha. by species and diameter classes for Plywood species.	4.11	97
Volume/ha. by species and diameter classes for Matchwood species.	4.12	97
Volume/ha. by species and diameter classes for Constructional wood species.	4.13	98
Volume/ha. by species and diameter classes for Ornamental wood species.	4.14	98
Volume/ha. by species and diameter classes for Non-commercial wood species.	4.15	99

STRATUM - EVERGREEN ( IN '000 M<sup>3</sup> )

Total volume by species and diameter classes for Plywood species.	5.1	100
Total volume by species and diameter classes for Matchwood species.	5.2	100
Total volume by species and diameter classes for Constructional wood species.	5.3	101
Total volume by species and diameter classes for Ornamental wood species.	5.4	101
Total volume by species and diameter classes for Non-commercial wood species.	5.5	102

STRATUM - LITTORAL ( IN '000 M<sup>3</sup> )

Total volume by species and diameter classes for Plywood species.	5.6	103
Total volume by species and diameter classes for Matchwood species.	5.7	103
Total volume by species and diameter classes for Constructional wood species.	5.8	104
Total volume by species and diameter classes for Ornamental wood species.	5.9	104
Total volume by species and diameter classes for Non-commercial wood species.	5.10	105

Vol/ha.

Vol/ha.

Total vol.

Total vol.

	<u>Para</u>	<u>Page No.</u>
<u>STRATUM - DECIDUOUS ( IN '000 M<sup>3</sup> )</u>		
Total volume by species and diameter classes for Plywood species.	5.11	106
Total volume by species and diameter classes for Matchwood species.	5.12	106
Total volume by species and diameter classes for Constructional wood species.	5.13	107
Total volume by species and diameter classes for Ornamental wood species.	5.14	107
Total volume by species and diameter classes for Non-commercial wood species.	5.15	108
Volume/ha. (in m <sup>3</sup> ) by stratum and utility classes	6.0	109
Total utility volume (in '000 m <sup>3</sup> ) for stratum Littoral, Deciduous and Evergreen	7.0	109
Per hectare total volume (m <sup>3</sup> ) by stratum and diameter classwise	8.0	110
Total wood volume (in '000 m <sup>3</sup> ) by stratum and diameter classwise	9.0	110
Per hectare distribution of stems diameter classwise and stratumwise	10.0	111
Total stems - diameter classwise and stratawise (in '000)	11.0	111
Cull percentages by diameter class - Little Andaman	12.0	112
Bark percentage in species-wise	13.0	113
Cyclone damage study for Evergreen and Littoral stratum	14.0	114
Damage percentage of some important species by Cyclone	15.0	115
List of Little Andaman species enumerated with their code no.	16.0	116
Volume table - important commercial species for Little Andaman	17.0	118

#### APPENDIX

The Alphabetical name of enumerated Little Andaman species.	-	119
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#### MAP AND GRAPH CONTENTS

1. Map of India showing project area of Little Andaman.
2. Map of Little Andaman.
3. Map of Little Andaman showing the Forest area.
4. Map of Little Andaman showing the Grid points.
5. Map showing the roads of Little Andaman.
6. Map showing the size of the plot.
7. Histogram showing utility volume/ha. of different stratum.
8. Histogram showing estimation of utility volume of different stratum.

## P R E F A C E

The Survey of Forest Resources of Little Andaman was taken up during October, 1976 to April, 1977. The objectives of the survey were (i) to estimate the volume of growing stock and its distribution under various utility classes viz., Plywood, Matchwood, Sawn wood, Ornamental wood, Non-commercial wood, Residual wood and Small wood, (ii) to compile volume tables for important commercial species, (iii) to indicate the industrial possibilities of the area.

The report presents the basic facts about area surveyed, the methodology adopted and various findings. An abridged report showing in a nutshell a summary of the main report has also been prepared.

Virgin forest of the islands which were in their pristine glory for ages had very dense and resourceful base of luxuriant growth. The idea prevalent among the forest officers was that the bulk of the crop was mature and putting on negative increment. The survey, however, has revealed that there is adequate crop of middle and lower age groups and regeneration to compensate the stagnation of increment in mature crop.

The findings of the Preinvestment Survey Of Forest Resources of Little Andamans reveal a fantastic resources of wood materials. It not only supports the findings of the National Industrial Development Corporation Ltd. of viability of establishing industry with 10,000 m<sup>3</sup> of construction and 5000 m<sup>3</sup> of plywood timber in both Little Andaman & Nicobar Islands, it points at a huge surplus for bigger Industrial Development. The problems, however, centres round (a) adequate supply of timber (b) high cost of logs (c) easy availability of shipping for transport of finished product (d) high rate of shipping freight (e) high extraction cost. The field work was carried out under the able guidance of Dr. A. K. Banerjee, Zonal Coordinator who was later on succeeded by Shri A.B. Chaudhuri under whose guidance processing and drafting has been carried out.

The Preinvestment Survey Of Forest Resources acknowledges the hard and arduous work put in by the members of the staff of Eastern Zone headed by the Zonal Co-ordinator.

( A.B. Chaudhuri )  
Chief Coordinator.

P R E A M B L E

The Andaman & Nicobar Islands are the most isolated parts of Indian Union. The Little Andaman forests which are still in their pristine glory and practically untouched was considered one of the biggest source of high-grade wood in the country. A large variety of timber such as Gurjan, White Dhupe, Chuglam, Papita etc. are available for commercial exploitation, Gurjan being the most important species of timber.

Keeping in view the extensive availability of timber, the Ministry of Food & Agriculture, Government of India vide their No. F-2-34-68-F.11 dated 1.10.71, commissioned the National Industrial Development Corporation Ltd., New Delhi for carrying out survey of establishing Plywood factory, Saw Mills and to study export potential for logs, Sawn timber, Plywood and wood chips to foreign countries. Later M/S. Bhargava Consultants (P) Ltd., New Delhi at the instance of the Food & Agriculture Organization of the United Nation, Rome, in continuation of the studies in the "Potential for Pulp and Paper Development in India", under the Asia Component of the Pulp & Paper Industries Development Programme, Phase - II also had undertaken a study on the resources potential of paper and pulp in Little Andamans and in other Islands. But there was no reliable data on which their recommendations could be based.

The Pre-investment Survey of Forest Resources, Eastern Zone was, therefore, directed by the Government of India in 1976 to undertake the resources survey of the Andaman Forests. The work in Little Andaman was undertaken during the period from November, 1976 to March, 1977.

## INTRODUCTION

The Andaman and Nicobar Islands, a Union Territory of India are a chain of 556 Islands & Islets in all (554 in Andaman group) and are the most isolated parts of Indian Union situated in the South-Eastern part of Bay of Bengal and lying between 6° and 14°N latitude and 92° and 94° longitude. The average distance is about 1200 km. from main land mass. The area break-up of the Islands is as under :-

Total geographical area - 829,300 ha.  
Forest area - 746,400 ha..  
Effective forest area - 642,000 ha.  
(Excluding tidal swamps, steep hills and mangrove belts).

The Andaman and Nicobar Islands can be divided into two major groups on the basis of its geographical situation.

Little Andaman Island is situated at the southern extremities of Andaman District and is lying between 92°-22' to 92°-37' - East longitude and 10°-30' to 10°-55' - North Latitude. The geographical area of the Island is 734.39 km<sup>2</sup>. Some small patches have been cleared in recent days for settlement of refugees from erstwhile East Pakistan and repatriates from Burma and Srilanka.

Hut Bay is the only town and port of Little Andaman. The Hut Bay Jetty measures 72 m. in length, 11 m. in breadth and water at lowest tide is 6.50 m. deep. The construction of 1200 metres break water has been completed at Hut Bay in Little Andaman. As a result it will be possible to use the Jetty for almost entire year. According to the plan the berth will have 7 m. depth of water and will be able to accommodate ships similar to M.V. DIGLIPUR which has been acquired by the Shipping Corporation of India to transport the timbers from Andaman Island.

The total population of Little Andaman is approx. five thousand. The Onges are the only tribal of this Island and their number is 112 (one hundred and twelve). They live in South-Eastern corner of the Island. The Onges have accepted the cooperation and help extended to them and are now living as civilized citizens. They now mix with other residents of the Islands quite freely. They are used to gather dhup (resin) and honey from the forests and sell the same to consumer cooperative society.

About 90% of the geographical area of this Island is covered by valuable forests. Productive area under forest is about 70% of the geographical area. A separate forest division has been established for this Island in 1975. The Little Andaman abounds with an excellent stand of Gurjan, but Padauk is absent. This type of unique tropical forests of precious gene resources of rare species is not found anywhere in the whole of south and South-East Asia.

## BACKGROUND INFORMATION

An exploration of forest of Andaman was done by Dr. Halfer, a Russian Scientist in 1839. A botanical exploration was made in 1970 by Mr. S. Kurz and in his report he showed that Sea Mohwa was the best among the Andaman timbers. The Andaman Forest was untouched till 1857 and in 1883 a Forest Officer was deputed in Andaman for management of the forests.

Forestry in Andaman dates back to 1883. There was no regular Working Plan and exploitation was confined to Padauk, Silver grey, Kako and lately Gurjan. Selective felling was in vogue. In 1929 Matchwood and Plywood industries were established and in 1930-31 a number of new species were marketed. During the war, work was confined to only extraction of few species of timber.

After the war and partition of Bengal, a large number of displaced persons were rehabilitated in several Islands by clearing of forests. Post war reconstruction demanded more and more quantity of timber. Gradually the forest extraction was mechanised.

Owing to difficulty in transportation of timber, forest industry could not grow to a considerable extent, except the Government Saw Mills which was established in 1883.

In 1952 after re-occupation of the Islands, Shri B.S. Changappa prepared a Working Plan for North, Middle & South Andamans but no plan was made for Little Andaman. In 1975 a separate Forest Division was formed as Little Andaman; but no Working Plans for Little Andaman has been written so far. Still to-day the forest departmental activity is very limited in this Island.

During the Second World War between 1942 to 1945, the Japanese occupied the entire Andaman Islands from the British Government. Therefore, they utilised the Islands forest wealth hapazardly and ruined extensive areas of beautiful forests.

A Corporation named "Andaman & Nicobar Islands Forest & Plantation Development Corporation Ltd.," has been established for the development of logging, marketing and raising of plantation.

The main objectives of the Corporation are given below:-

- (1) Development of infrastructure for industries.
- (2) Finding suitable uses for secondary timbers.
- (3) Regeneration with more valuable species.
- (4) Marketability of the product and supply of pulpwood/  
non-commercial wood.
- (5) Market studies and promotional activities.

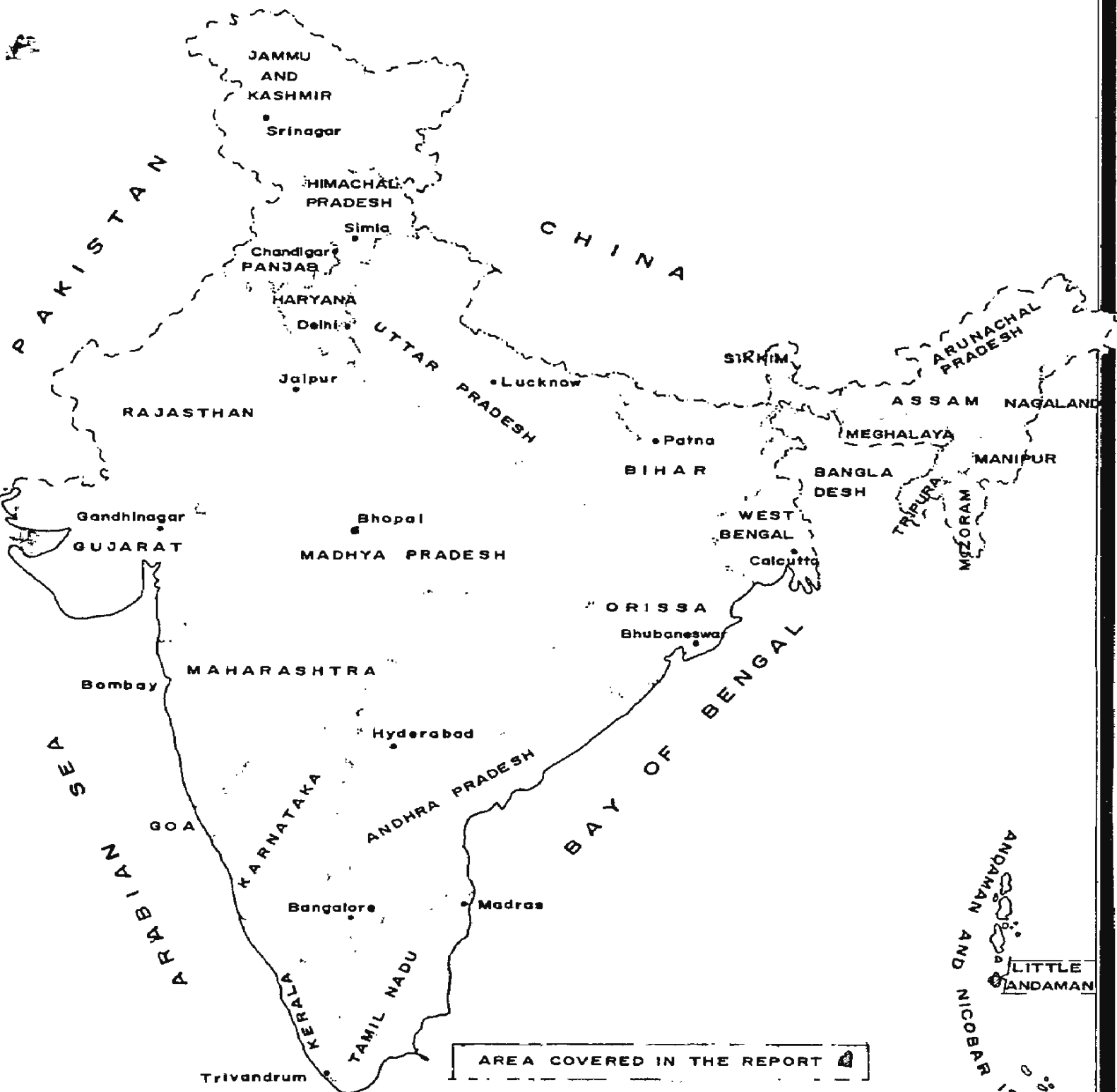
Various attempts have been made to estimate the total growing stock of the valuable timber found in the Island but all the estimates which have been procured till now are tentative. No scientific survey to be required degree of accuracy has been carried out except that the Andaman & Nicobar Forest and Plantation Development Corporation Ltd., carried out 10% enumeration of the Little Andaman Forest.

Pre-investment Survey of Forest Resources was requested by the Forest Department of Andaman & Nicobar Islands to make a study of Little Andaman to estimate the availability of the forest resources as the systematic sampling for inventory done earlier by the Forest Department was not on a sound statistical footing. Accordingly the survey of Little Andaman was undertaken at the instance of Government of India in November, 1976.

# MAP OF INDIA

SHOWING PROJECT AREA LITTLE ANDAMAN

SCALE — 1 15,000,000



C H A P T E R - 1  
G E N E R A L

1.1 Name of the area :

The area surveyed is name Little Andaman Island and forms the Southernmost Island of the Andaman group of Islands situated about 120 km. from the Southern tip of South Andaman Island.

1.2 Location :

Little Andaman Island is situated at the southern extremities of Andaman District in the Union Territory of Andaman & Nicobar Islands. This Island covers a geographical area of 73439 ha. and is situated between  $92^{\circ}21'$  to  $92^{\circ}37'$  East longitude and  $10^{\circ}30'$  to  $10^{\circ}54'$  North latitude. Hut Bay, the port of Administrative centre of the Island is about 140 km. from Port Blair, the capital of the Union Territory and is about 150 km. from Car Nicobar, District Headquarters of Nicobar District.

1.3 Factors of locality :

Original inhabitants of this Island were a handful of Aboriginal tribe called 'Onge'. At present their population is reduced to about 112 only owing to various genetical reasons. Government have taken up a project to settle them at Dugong Creek on a permanent basis.

The major part of recent inhabitants of this Island consists of Bengali displaced persons from East Bengal. Besides, some Tamilian repatriates from Burma and Srilanka have also been settled. The remaining po-pulation comprises of Government servants and workers posted here in connexion with Harbour building activities and other departmental workers.

Literacy is about 44%, about 40% of the total population are workers. Most of the labourers belong to Bihar, Tamil Nadu, Andhra Pradesh & Kerala. 36% of the population work for Agriculture, Forest, Fisheries and Plantation. Major portion of the work force come from Bihar (Ranchi Tribal Area).

The local settlers are under-employed. There is continuous influx of Adivasis of Bihar & Ramanand District of Tamil Nadu.

1.4 Physical feature :

The Island has an elongated shape and spreads in North-South direction. Maximum length of the Island is about 40 km. and maximum width is about 25 km. The land is more or less flat along the coast to a varying width and there is a small ridge running North-South in the centre of the Island. The hilly portion of the Island is mostly broken though the elevation is seldom beyond 150 km. from the mean sea level.

The maximum height is about 210 m. and is situated almost at the centre of the Island. Northern portion of the Island is almost flat with ~~with~~ mangrove and swamp covering the area. There are quite a number of creeks, flowing nalas and small waterfalls. The Kojilae Nala, probably the longest in the Island originates from the ridge at the centre and flows south along the western side of the hill to south bay. The longest nala to the east of the ridge is probably 'Tae-eye' which also originates from the central hilly part of the Island and flows east twisting around the hillocks and falls in Dugang Creek. Of the creeks, Jackson creek flows to North-West coast, Dugang creek flows to North-East coast and Bumila creek and Egu-belong creek flows to North-East. There is no creek of considerable length at south, south-east or south-west except the estuary of Kojilae nala at South Bay.

The coast line along the eastern edge is mostly sandy with a few creeks penetrating it. The west and south coast line is more rocky with a few sandy beaches and mangrove forests cover the creeks. The northern coast line is entirely covered by mangrove with many shallow and short creeks penetrating it.

There are quite a number of inland swamp often caused by nalas, mouth of which gets blocked seasonally by shifting sand. These are mostly either sweet water swamps though some of these have practically blackish water caused by seepage from the sea in the proximity. In such areas big shallow lakes are formed which drain off when the mouth of the nala again gets opened. Most nallas flowing through sandy coasts get blocked by deposit of more sand during a particular monsoon and again get cleared when monsoon changes direction. On the western side of the Island such swamps are not common, as the coast line is rocky to a great extent.

1.4.1 Terrain in Little Andaman :

The following are terrain classification :-

Type of land	Survey area in ha.	Un-surveyed area in ha.	Total area in ha.
1. Hilly and Undulating	20488.45	8312.49	28860.94
2. Flat land			
(i) Land leaving limestone exposure or unsuitable for cultivation.	8217.80	24,280.68	32498.48
(ii) Land suitable for paddy cultivation.	7510.02	-	7510.02
(iii) Mangrove swamp	-	2606.13	2606.13
(iv) Fresh water Thuls	-	1467.36	1467.36
TOTAL	36216.27	36,666.66	72882.93

### 1.5 Geology, Rock & Soil :

The Little Andaman Island, like the Andaman group of Islands are a southern continuation of mountain ranges of Western Burma. The Islands are peaks of the Northern Arc extending through the Bay of Bengal. Principal types of the rocks are (i) Serpentine series and (ii) Sedimentary series.

On decomposition, the serpentine series give a thick covering of soil fertile in the lower strata with good internal drainage and the presence of springs at places. The top soil has a high base status of less nutrient value and low exchange capacity.

In Little Andaman sandstone seems to be absent. In its place claystone forms the underlying rock while on the top layer limestone is most commonly seen. Corals are also found quite deep in land. Humus or organic matter is completely lacking even in forest soil owing to slope and loose texture of the soil.

The soil is varying from place to place. It is clayey in the tidal swamp area. This changes to clay loam and alluvial as we go in-land. In the valley percentage of clay in the soil is found to be more. The soil is also highly calcareous and the swamps are mostly saline alluvial.

Soil is acidic though sub-soil may be neutral. It is rich in organic carbon and medium in Nitrogen phosphoric Acid and potash are also available. Calcium is leached down and deposited in sub-soil because of heavy rainfall. Deep soil also has soluble salts. High temperature and rainfall favour rapid mineralisation of organic matter.

The surface soil is light and upper horizon seems to be devoid of finer material and soluble salts. Removal of Calcium Salt from the soluble salt indicates heavy leaching.

All India Soil and Land Use Survey Organization has surveyed soil in the Islands, and has categorised seven distinct soil series.

Most of the forests have depth from 31 to 180 cms. below which rock comes in.

#### 1.5.1 Humus :

A study shows that in all types of forests humus depth seem to be as follows (in percentage) :-

<u>Forest Type</u>	<u>D e p t h</u>	
	<u>0-4 cms.</u>	<u>5-8 cms.</u>
Evergreen	88.4%	11.6%
Deciduous	88.9%	11.1%
Littoral	88.9%	11.1%

1.6 Climate :

Andaman & Nicobar Islands get rain fall from both North-East and South-West monsoon, and, therefore, it is very high and spreads over about 9 months in a year. The rainfall is heavy throughout the year except for the months of January, February & March. Practically there is hardly a month which is totally dry. Rain is very heavy during South-West Monsoon though North-East showers are also quite considerable. Heavy wind and gale are quite common and cyclonic weather is very frequent, specially during the transition period of monsoon. Mean annual rainfall varies from 3140 mm. to 3200 mm. Mean annual humidity is also high and varies from 80% to 82%. Little Andaman being close to the equator, is hot and humid, and winter is almost confined to a few days in late December and early January, when the temperature falls to 21.5°C. Mean annual temperature varies from 26°C to 27°C and maximum temperature rises to about 31°C to 32°C during April - May.

1.6.1 Climate Chart :

Year	M.A.T. (Max.) (Centigrade)	M.A.T. (Centigrade)	M.A.T. (Av.) (Centigrade)	M.A.H. (%) (at 1730hrs.)	M.A.R. (mm.) (Hut Bay)
1970	30.7	23.2	26.9	82	3449.0
1971	30.3	22.5	26.4	80	3259.1
1972	29.9	21.9	25.9	80	3444.0
1973	29.7	23.1	26.4	80	2876.2
1974	29.4	22.3	25.8	80	3022.1
1975	29.0	22.0	25.0	80	3674.1

1.6.2 Rainfall :

Monthly rainfall and number of rainy days recorded at Port Blair during the year 1961 to 1965 are as follows :-

Month	No. of rainy days	Rain fall in mm.	No. of rainy days	Rain fall in mm.	No. of rainy days	Rain fall in mm.	No. of rainy days	Rain fall in mm.	No. of rainy days	Rain fall in mm.
January	5	62.6	13	177.7	4	70.9	2	16.2	1	10.2
February	8	180.1	4	13.6	1	8.2	1	2.7	1	25.9
March	3	39.2	-	0.0	3	12.7	0	0.0	1	21.4
April	8	109.0	6	36.0	5	122.4	1	3.1	3	54.1
May	29	106.6	22	305.5	11	234.23	23	587.9	20	322.6
June	22	412.3	27	423.5	29	434.4	21	592.3	15	409.9
July	23	357.4	27	449.6	24	326.8	14	354.3	16	421.4
August	30	721.6	28	465.7	30	684.6	18	468.8	18	430.0
September	27	705.1	24	521.7	25	609.0	26	662.4	24	577.8
October	20	320.1	21	228.9	24	367.1	15	217.9	22	313.1
November	16	310.9	14	145.1	14	95.0	19	394.3	12	121.4
December	6	83.3	8	493.1	15	269.8	3	23.9	12	507.9
<b>TOTAL</b>	<b>197</b>	<b>3408.2</b>	<b>194</b>	<b>3260.4</b>	<b>185</b>	<b>3235.2</b>	<b>143</b>	<b>3323.8</b>	<b>145</b>	<b>3215.7</b>

This pattern and range of rainfall is likely to be same at Hut Bay.

1.6.3 Annual Rainfall recorded in various Islands in mm. are as follows :-

Station	1970	1971	1972	1973	1974	1975
Post Blair	3663.0	2964.2	3760.0	2912.0	3093.7	2764.5
Long Island	2870.6	2753.0	3539.5	2607.8	2665.4	3240.5
Car Nicobar	2610.7	2800.1	1767.7	3353.8	3827.5	4287.0
Hut Bay	3449.0	3259.1	3444.0	2876.2	3022.1	3674.1

1.6.4 Rainfall data in respect of Little Andaman from 1969 to 1977.  
MM.

Months	Year 1969	Year 1970	Year 1971	Year 1972	Year 1973	Year 1974	Year 1975	Year 1976	Year 1977
January	175.10	171.90	3.50	32.50	6.50	9.60	57.40	40.00	152.40
February	107.20	6.80	3.75	-	3.00	79.00	41.50	-	41.00
March	-	20.60	24.00	5.00	42.50	8.50	-	-	-
April	27.20	89.80	68.30	170.25	39.75	420.20	39.50	225.40	8.40
May	369.40	432.63	544.00	184.75	456.00	327.70	342.20	413.90	303.00
June	270.60	288.37	245.50	595.75	638.95	303.00	712.20	512.40	372.90
July	162.80	480.00	450.25	487.00	176.40	309.10	235.20	434.00	223.00
August	268.00	325.00	345.25	513.50	323.30	414.20	367.60	675.80	241.00
September	612.00	446.25	588.02	442.70	287.50	343.70	488.34	275.00	NA
October	120.00	457.00	676.12	373.50	359.00	621.90	540.00	225.80	NA
November	344.40	650.75	261.25	579.00	317.40	559.00	410.00	363.00	NA
December	38.60	246.75	104.75	215.50	250.20	92.80	94.40	368.00	NA
TOTAL	2505.30	3618.25	3314.69	3589.45	2900.50	3488.50	3328.34	3493.30	

1.7 Cyclone :

Cyclones pass over the Islands causing damages every 50 years or so. Records show that in 1792, 1844 and 1891 and Cyclones passed over a number of Islands. In the year 1976 a severe cyclone passed over Little Andaman causing extensive damage (for detailed information refer to Table No. 14 and 15).

1.8 Water supply :

In spite of heavy rainfall spreading over about 170 days fresh water is scarce. Many streams dry up during March to May. Water wells have not proved successful at many places. The soil has a very poor water retaining capacity. Where there is sedimentary rock, soil formed from such rocks are often interbedded with clays with the result that run off is heavy.

1.9 Natural Resources :

Little Andaman is enriched with natural forest resources. The forest extends over 90% of this Island. This Island abounds in an excellent stand of Dipterocarpus which may offer immense potential to meet a major percentage of the requirement of Government Departments.

In the year 1976-77 the Preinvestment Survey of Forest Resources organization carried out a survey of the area based on sound statistical design to estimate the forest resources. Forests are the main source of ~~xxx~~ revenue of this Island and are principal basis of its economic development.

Total growing stock was found to be 17,518.433 thousand m<sup>3</sup> distributed in various utility classes of timber in percentage as follows.

Plywood form	- 11.623%
Matchwood form	- 14.379%
Constructional wood form	- 11.244%
Non-constructional wood form	- 28.943%
Residual wood	- 26.957%
Small wood	- 6.824%

Of the above mentioned six categories of timber, plywood, matchwood and constructional wood have been categorised as commercial wood and the balance as non-commercial wood. The commercial wood is 6525106 m<sup>3</sup> and non-commercial wood is 10988435 m<sup>3</sup> which are 37.247% and 62.7250% respectively of the total growing stock.

The detailed information on natural resource of utility volume (in .000 m<sup>3</sup>) is as under :-

(1) Plywood	- 2036.241
(2) Matchwood	- 2519.063
(3) Constructional wood	- 1969.802
(4) Non-commercial wood	- 5070.407
(5) Residual wood	- 4722.461
(6) Small wood	- 1195.567

The utility volume per hectare in m<sup>3</sup>

(1) Plywood	- 31.174 m <sup>3</sup>
(2) Matchwood	- 38.567 m <sup>3</sup>
(3) Constructional wood	- 30.157 m <sup>3</sup>
(4) Non-commercial wood	- 77.628 m <sup>3</sup>
(5) Residual wood	- 72.301 m <sup>3</sup>
(6) Small wood	- 18.304 m <sup>3</sup>

It has been found that the total forest area in Little Andaman is 65,317 hectares (excluding the swamp area) and the average stocking is 268.2063 m<sup>3</sup> per hectare.

No other natural resources have yet been explored.

1.10 Land Use :

The entire land of the Island is owned by the State. Nobody can own land or hold land as a tenant. The land tenure is being provided as House Sites by issuing licence which is also terminable on one year's notice.

Total geographical area of Little Andaman is 73439 ha.; out of this only 2603 ha. have been deforested for Red Oil Palm Plantation and for other purposes. Besides, there are certain areas reserved as Aborigin (Onge) Reserve and Naval.

A land use committee has been set up by the Andaman Administration to advice the Ministry on the pattern of land use. This will have some check on deforestation for rehabilitation programme.

A Multi-disciplinary Study Team set up by the Government of India has recommended that to prevent destruction of gene-reservoirs, natural reserves should be established in all ecological systems and suitable blocks left untouched with south-west of of Litte Andaman besides, areas in other Islands.

1.11 Slopes Classification :

Slope classification of entire forest was made and from analysis it is seen that 3.5% of the area has 21° to 30° slope while the rest of 96.5% area has a slope varying between plain to about 20° slope.

1.12 Topography classification and forest strata :

	<u>Aspects (% distribution)</u>							<u>Total</u>
	<u>Single</u>	<u>Double</u>	<u>Multiple</u>	<u>Broken</u>	<u>Valley</u>	<u>Plateau</u>	<u>Plain</u>	
Evergreen -	42.86%	16.96%	8.04%	1.79%	3.56%	1.79%	25.00%	100%
Deciduous	33.33%	5.56%	5.56%	55.55%	-	-	-	100%
Littoral	55.55%	16.66%	5.56%	-	-	-	22.23%	100%

1.13 Vegetation :

Little Andaman Island is almost entirely covered by luxuriant forest except for a very small portion recently cleared for settlement. The forests are moist tropical; the composition is multi-storeyed and dense with lofty canopy. Giant overmature trees are common. Gregarious dominants are not very common and large number of species of trees occur in close association. The canopy is extremely dense and attains height of 50 m. or even more. Epiphytes are numerous specially aroid, ferns and orchids. Climbers vary greatly in number and more conspicuous in semi-evergreen and moist deciduous patches. Ground vegetation and undergrowth in most part are scanty except for patches of Strobilanthus-carpt and tangles of Canes creeping bamboo and palm Erect bamboos and grasses are absent. Long cylindrical boles, scanty branching and huge plank buttresses are frequently seen.

The following types of forest are commonly seen (Champion & Seth's classification code in bracket) :-

- |                                       |                         |
|---------------------------------------|-------------------------|
| (1) Giant evergreen forest            | - (1 Ac <sub>1</sub> )  |
| (2) Andaman tropical evergreen forest | - (1 Ac <sub>2</sub> )  |
| (3) Andaman moist deciduous forest    | - (3 Ac <sub>1</sub> )  |
| (4) Andaman semi-evergreen forest     | - (2 Ac <sub>1</sub> )  |
| (5) Littoral forest                   | - (4B/TS <sub>2</sub> ) |

Besides these, small patches of Myristica swamp forest have also been seen in this Island. This is found in the swamps caused by the seasonal inundation of areas by the nalas which get blocked seasonally. These are fairly dense evergreen forests which attain average height of 30 m. or more with clean slender boles standing in mud through which abundant knee roots and sometimes buttressed roots are produced. There is hardly any undergrowth. Myristica species forms almost gregarious patches often in association with Pisonia excelsa, Barringtonia species, Syzygium species, Pandanass species, Cycas species, Calamus species, Plecosperrum and Andamanicum etc.

#### 1.14 Legal Status :

Previously the forests were administered under the provision of the Andaman Administrative Circular No. XVIII whose authority is derived from Regulation III of 1876. The Authority to issue such local rules is now derived from the Indian Forest Act, 1927.

Little Andaman has been constituted as a separate Forest Division in 1975. Entire forest is owned by the State. Besides, this being inhabited by 'Onge' an aboriginal tribe, the entire Island an area of about 2400 ha. has been set aside as Aborigin Reserves. Revenue settlement of the areas released for rehabilitation has also not been taken up so far. It is also learnt that the area deforested for different non-forestry purposes has also not been dereserved and demarcated as yet, but this is under process.

#### 1.15 Demarcation :

Since the entire area of Little Andaman formed a part of South Andaman Reserved Forest no separate demarcation was done. Construction of Jetty and breakwater and ~~some~~ settlement of refugees were taken up recently. For this purpose certain areas from non-reserved forest were surveyed and roughly demarcated. However, Andaman Forest Department has taken up permanent demarcation of forest areas and it is expected that in due course this area will also be demarcated properly with R.C.G. pillars on the boundaries.

1.16 Forest Settlement :

There is no local settlement in the true sense of the term. But an area of 2400 ha. at Dugang creek has been set aside for settlement of 'Onges's within the Reserved Forests. There is reclamation plan to clear up about 25000 ha. but this is under revision.

1.17 Socio-economic Condition :

Remoteness and difficulties of transport and communications have stood on the way of the socio-economical progress of the Island.

Economics of this Island is so far agriculture based except the floating population who are mostly Government Employees. Since very little area has so far been released for agriculture and that too only recently no proper economy could grow till now and there is very little scope. Forestry can effort to establish a better economical status. At present Forest Department extracts and exports about 7 to 10 thousand m<sup>3</sup> of timber from this Island annually.

1.18 Infrastructure :

Andaman and Nicobar Islands have the biggest bottleneck of communication between the Islands. Waterway being the only link, lack of good harbour and port with proper landing facilities pose handicaps. Little Andaman was first linked up with Port Blair as late as 1965 when Government of India took up an ambitious project of constructing a jetty with about 2 km. long artificial breakwater at Hut Bay. Since then Andaman Harbour workers and some other Government Departments moved in. Today the jetty and the breakwater have been constructed. Simultaneously settlement of villages have come up.

In Little Andaman an all weather road of 22 km. has been constructed from Hut Bay to Vivakanandapuram (3rd village). Besides, there is another 2 km. approach road to the query from Hut Bay. There is a temporary fair-weather road about 13 km. in length from Hut Bay to the Light House point at South Bay. Of this first 5 km. has been opened by the A.H.W. to connect the Nicobary village with Hut Bay. On this stretch all the culverts have been built though road work itself has not yet been taken up. The remaining 8 km. is maintained by the Light House and Light Ship Department for transporting their stores etc. to the Light House site. This stretch is purely temporary. All these roads run more or less along the sea shore. There is ~~not~~ no road, temporary or permanent across the Island or beyond 3 km. inland.

Evaluation of ports and infrastructural facilities have been discussed in great detail in the report of M/S. Bharagava Consultants (P) Ltd. and as such would not be discussed here.

The electricity is only produced by A.H.W. will small diesel generator for their official and domestic use at Hut Bay. There is a proposal for Electricity Department to move in shortly.

1.19 Detail of wood-based industries of Andaman Islands:

N	A	M	E	Year of establi- shment	Installed capacity in m <sup>3</sup>	Average annual consump tion.	No. of working days
1.	The Western India Match Co.			1829	10,000	8,000	-
2.	Andaman Timber Industries Limited.			1959	13,400	12,000	-
3.	Jayshree Timber Products, Bakultala.			1964	16,800	10,000	67
4.	Asiah Woods & Polymers (P) Ltd., Long Island.			1965	16,800	6,000	-
5.	Forest Department, Saw Mills, Batapur			1956	4,500	3,000	65
6.	Forest Department Saw Mill, Chatham.			1883	35,000	32,000	1079
7.	Andaman Harbour Works Saw Mill, L.Andaman.			1970	3,000	2,000	
8.	Andaman Wood Products Saw Mills, Port Blair.			1952	3,000	2,000	54
9.	Shri Dori Lal's Saw Mills, Patrapur.			1958	1,500	1,000	9
10.	Shri Muri Lal's Saw Mills, Port Blair.			1971	1,500	800	-

Cont

Very recently the following timber industries have come up besides those already existing :-

1. Cooperative Saw Mills, Billiground, Middle Andaman.
2. Rajkumar Saw Mills, Port Blair.
3. Harbour Saw Mills, Port Blair.
4. Raj Shipping & Timber Industries, Dundus Point, Port Blair.
5. Elephant Saw Mills, Great Nicobar.
6. Kamardhi Saw Mills, Tylerabad.
7. Silvery Jubilee Multipurpose Saw Mills.
8. Vanapana Pencil Wood Industries.

1.20 Local Demand :

The local demand is very negligible. Firewood is obtained from fallen trees, Mangrove trees, rotten logs and tops of timber trees from principal felling. The present population needs little quantity of fuel but future requirement may be high if settlement of more displaced persons are made. As approximate consumption per year has been estimated at 1,50,000 quintal.

Canes have some market as walking sticks, baskets and furnitures making industry, but unfortunately no industry has yet developed.

Oil and resin are not generally extracted out of Dipterocarpus. While Dhup and Red Dhup - called Rock dammar are commercially available but at present there is no demand; 12,712 kgs. was collected in 1966-67 and sold.

The Little Andaman is extracting annually 15,000 m<sup>3</sup> of timber and almost entire quantity is transported to Port Blair and Mainland. This industry has so far developed in the Island. Attempts are being made to develop industries in the Island.

1.21 The Future Possibilities :

The demand of forest resources is very limited at present in Little Andaman in proportion of the stock available there. The demand for fuel wood is also limited. It is a paradox that the plywood mills and other wood-based industries in Calcutta are becoming less productive and gradually decreasing in number for want of wood while bulk remain unexploited in this Island. The Plywood industries in Calcutta, depend much upon the supply of wood from Andaman. Among the Andaman species special demand is for Gurjan wood and it is the chief species in Little Andaman. Besides this, many other valuable species are found. There is also a great demand for these timbers in the foreign countries and such demand is gradually increasing. Consequently the future of timber is very bright.

Various data on forest resources that have been collected so far indicate that the pulp and other wood-based industries can be established in the Islands provided the problem of electricity, water and labour was solved.

1.22 Maps :

Forest survey maps of the Andaman Island were made in 1883-86 mapped on a scale of  $\frac{1}{2}$ " = 2 miles. In 1887 detailed survey was made and maps prepared on a scale of  $\frac{1}{4}$ " = 1 mile. This work was completed in 1906.

The following Survey of India map sheets covering the entire area of the Island were used for the survey.

Sl.No.	Index No.	Year of Survey	Scale
1.	87 B/5 - 5	1965 - 66	1,25,000
2.	87 B/5 - 6	-do-	-do-
3.	87 B/6 - 4	-do-	-do-
4.	87 B/6 - 5	-do-	-do-
5.	87 B/6 - 6	-do-	-do-
6.	87 B/9 - 2	-do-	-do-
7.	87 B/9 - 3	-do-	-do-
8.	87 B/10 - 1	-do-	-do-
9.	87 B/10 - 2	-do-	-do-
10.	87 B/10 - 3	-do-	-do-

1.23 Photographs

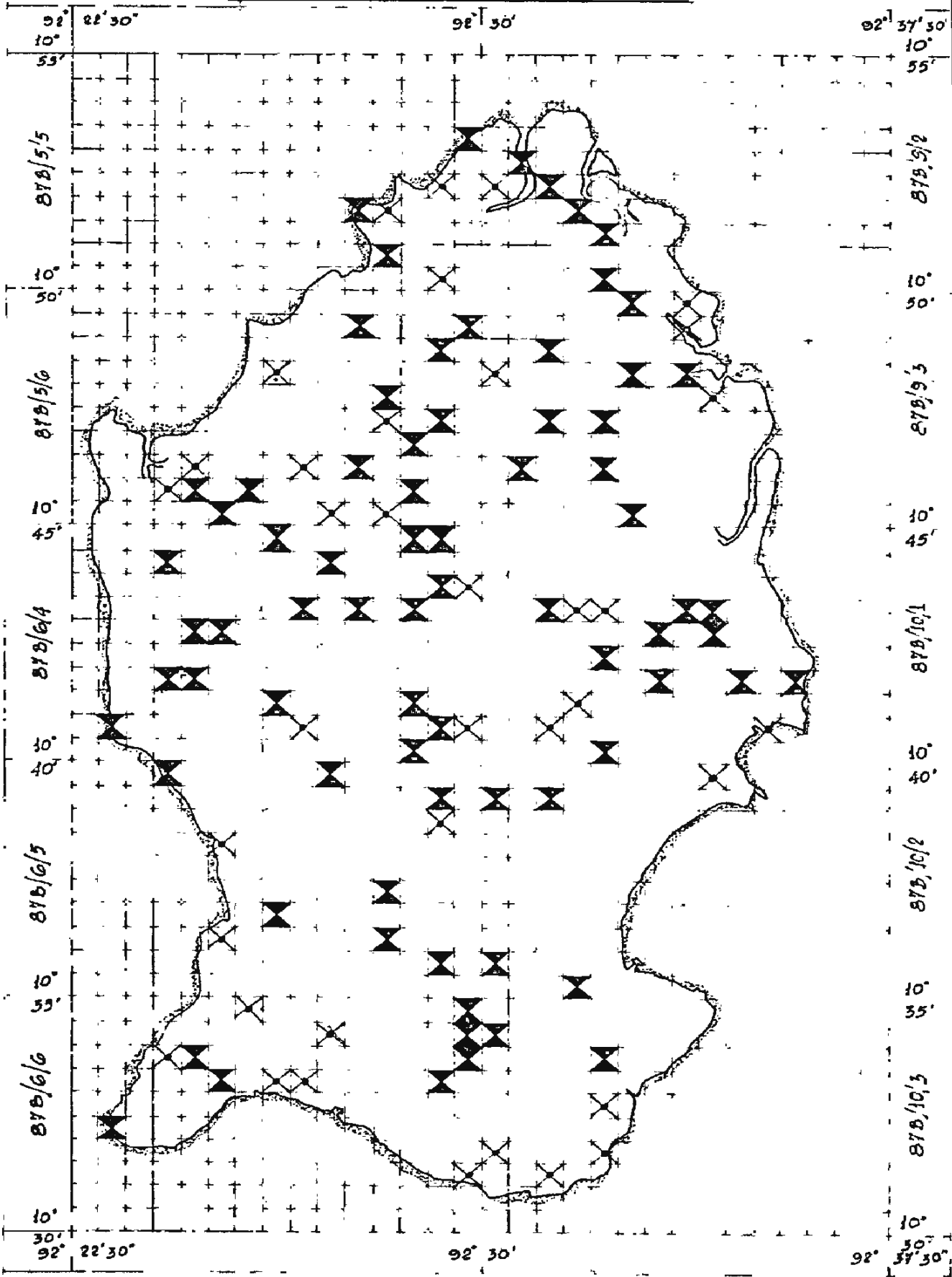
The following aerial photographs of specification No. 764-A on scale 1:25000 were used for delineation of different types of forest and for compilation of area.

<u>Strip No.</u>	<u>Photo No.</u>	<u>Total No. of A.P's</u>
58	2-16	15
59	2-13	12
60	2-8	07
61	2-11	10
62	1-12	12
63	2-23	22
64	2-21	20
65	3-16, 19-20	16
66	11-19	09
67	1-2	02
68	3-4	02
Total No. of A.P's		127

# LITTLE ANDAMAN

MAP SHOWING THE GRID POINTS

SCALE 1:2,00,000



SELECTED GRID POINTS    X  
 SUBTITUDE GRID POINTS    \*

C H A P T E R - II  
R E S O U R C E S   B A S E

2.1 Objectives :

During preliminary discussion with the representatives of Andaman Forest Department the following main objectives were agreed upon :-

- (a) Estimation of total volume of the growing stock within an error of  $\pm 10\%$  at 95% probability level.
- (b) To furnish an estimate of the growing stock separately on the basis of utility pattern to assess the resources potentiality for setting up wood-based industrial complexes; the utility classes are as follows :-  
I - Plywood, II-Match wood, III- Saw wood,  
IV - Ornamental wood, V-Non-commercial wood,  
VI-Residual wood, VII-Small wood.
- (c) Cull study for very important species like Gurjan (Dipterocarpus species), Badam (Terminalia procera) etc. and determination of cull percentage.
- (d) To compile volume tables for important commercial species.

2.1.1 Defination for different categories of timber :

- (a) Plywood :- Defined as wood of species indicated in Table No. 16 from serial Nos. 1-5 having dimension of 35 cm. d.u.b. to 100 cm. d.u.b.
- (b) Match wood :- Defined as wood of species mentioned in Table No. 16 from SL. Nos. 6-11 having dimension of 27 cm. d.u.b. to 100 d.u.b.
- (c) Constructional wood :- Defined as wood of species mentioned in SL.Nos. 12-25 in Table No. 16 having dimension of 35 cm. d.u.b. and above.  
The portion of Plywood and Matchwood species above 100 cm. d.u.b. are treated as Constructional wood.
- (d) Ornamental wood (Furniture wood) :- Defined as wood of species with SL.Nos. 26-30 mentioned in the Table No. 16 having dimension of 12 cm. d.u.b. and above.
- (e) Non-commercial wood :- Defined as wood of species with SL.Nos 31-58 in Table No.16 having dimension of 35 cm. d.u.b. and above.

(f) Residual wood :- Defined as wood of any species which are below the minimum acceptable dimension of all the categories and upto a minimum of 16 cm. d.u.b.

(g) Small wood :- Defined as wood of all species from 16 cm. d.u.b. to 4 cm. d.u.b.

Utility classes of timber with their code number may be seen at Table.

The Andaman Forest and Plantation Development Corporation Ltd., has been experimenting on various other non-commercial timber such as Bassia buterycia, Terminalia manii, Planchonia andamanica other 4/5 species for use as plywood timber.

### 2.1.2 Defination for other terms :

A. Cull - A cull means that part of a tree or log which is unusable. Cul can be reflected in two ways.

- i) Where the cull is obvious and can be located in the tree or log from outside examination. This will be referred as "Exposed Cull" and
- ii) where cull has not appeared in the outside of the tree or log but can be located when they are felled or cross-cut. This will be referred to as "Hidden cull".

B. Buttress flutings etc. :- Many trees have these morphological peculiarities. From industrial point of view they are not often usable.

C. Stumps :- Different trees depending on the location on which they are ~~gs~~ growing and also for their morphological characteristics need felling at different heights from the forest floor. In order to standardise the stump height the actual height at which they are felled were measured and averaged. The average stump height is calculated

### 2.2. Area statement:

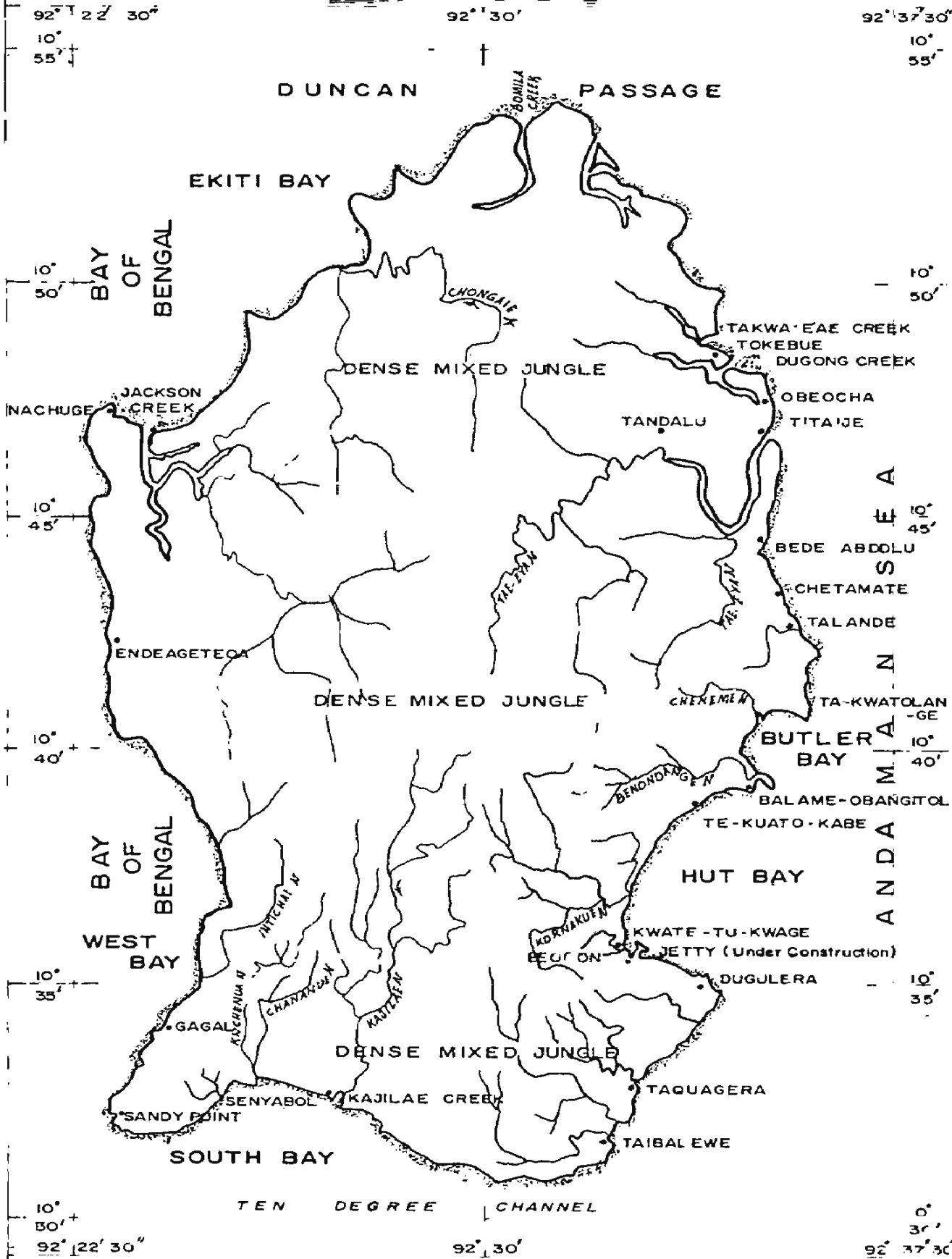
The aerial photographs showed on interpretation that Little Andaman have four different types of forests distinctly differing in growth, density and composition. Accordingly for the purpose of this survey the entire area of the Island was divided in four types (strata) viz., Mangrove swamps, Littoral Forests, Deciduous Forests and Evergreen forest. The Evergreen and the semi-evergreen forests hardly differ in composition and density and hence have been grouped together.

# LITTLE ANDAMAN

2,000m. = 1cm

SCALE :- 1 : 2,00,000

5 cm. = 1 km



The distribution of different strata in the forest area were calculated as per findings from the aerial photointerpretation. The following table will show at a glance the area distribution.

Area Statement Table

Name of the Island	Total Geographical area (ha.)	Others (ha.)	Swamp area (ha.)	Littoral area (ha.)	Deciduous area (ha.)	Evergreen area (ha.)	Net area covered under survey.
Little Andaman	73439	4096	4026	1336	5693	58288	65317

N.B.: - Survey has been carried out excluding swamp and other areas.

### 2.3 Forest Types :

Forests in Little Andaman can be broadly differentiated in six major types (Champion and Seth's types are indicated in bracket).

1. Southern Tropical wet evergreen forests (1A ci/c2)
2. Andaman Semi-evergreen forest (2A/ci)
3. Andaman moist deciduous forest (3A/ci)
4. Littoral Forest (4A/Li)
5. Mangrove Forest (4B/Ts2)
6. Myristica swamp forest (4c/Fs1)

Note :- Southern tropical wet evergreen forest can again be sub-divided in two types found in Little Andaman.

- (a) Giant evergreen forest (1A/ci)
- (b) Andaman tropical evergreen forest (1A/c2).

#### 2.3.1(a) Southern Tropical Wet Evergreen Forest :

##### (a) Giant Evergreen Forest (1A/ci)

This type is mostly met with on flat land near the bank of large streams and nalas. But these are often intimately mixed with semi-evergreen forests in small pockets at the foot hill in deep alluvial soil. There are the most luxuriant forests and ecologically they are climatic climax. The trees that attain a height of 50 to 55 m. are giant evergreen trees. Dipterocarpus, Artocarpus, Sideroxylon, Planchonia and Hopea are most common species in the top canopy. The predominant species of middle canopy which are almost evergreen, are Myristica and Pometia. Creeping bamboos and canes are abundant; erect palms are common. The shrubby undergrowth is rare and consists mainly of Strobilanthes, Ixora, Canthium, Polvalthia, when present.

##### Floristics

- I. Dipterocarpus alatus, D. grandiflorus, Artocarpus chaplasha, A. gomeziana, Planchonia andamanica, Sideroxylon lengpetia-latum, Pisonia umbellifera, Adananthere pavonina, Hopea odorata.

- II. Myristica andamanica, M. glaucescens, Xanthophyllum andamanicum, Pterospermum aceroides, Pometia pinnata.
- III. Brownlowia lanceolata, Acanthus ilicifolius.
- IV. Strobilanthus species.
- V. Dinochloa andamanica, Calamus palustris, C. pseudorivallis, C. andamanicus, Korthalsia laciniosa, Gnetum scandans.

2.3.1(b) Andamans Tropical Evergreen Forest (1A/c2)

There are multistoreyed forests but not as luxuriant as the giant evergreen forests. The top canopy is also not complete and often very irregular. These are seen on top of the hills and also in drier flat land inside the island. Deciduous species are more in number. Dipterocarpus alatus is replaced by Dipterocarpus grandiflorus and Dipterocarpus gracillis. General floristic composition of the type is more frequent, and gregarious occurrence common. Khattaphal, Jaiphal (Myristica species), Poon (Calophyllum soulattri), Artocarpus chaplasha, Planchonia andamanica, Hopea odorata, Baccaurea sapida and Endospermum chinense patches are quite common. Major portion of Little Andaman is covered by this type of forest.

2.3.2 Andaman Semi-evergreen Forest (2A/ci)

These forests occupy in land. Flat areas which are comparatively dry. Such forests border the evergreen forests. As such ecotone areas, various intimate mixtures of deciduous and evergreen species are found. The number of species is very large. The upper canopy consists of giant Dipterocarpus, Terminalia, Salmalia etc. and few other species either in group as in Pine formation. The middle canopy is distinct and is often made up of Myristica, Pometia, Pisonia etc. Bamboos are absent except the creeping bamboo Dinochloa; undergrowth is heavy and ground cover is largely made up of evergreen shrubs. Epiphytes are abundant including many ferns and orchids.

Floristics

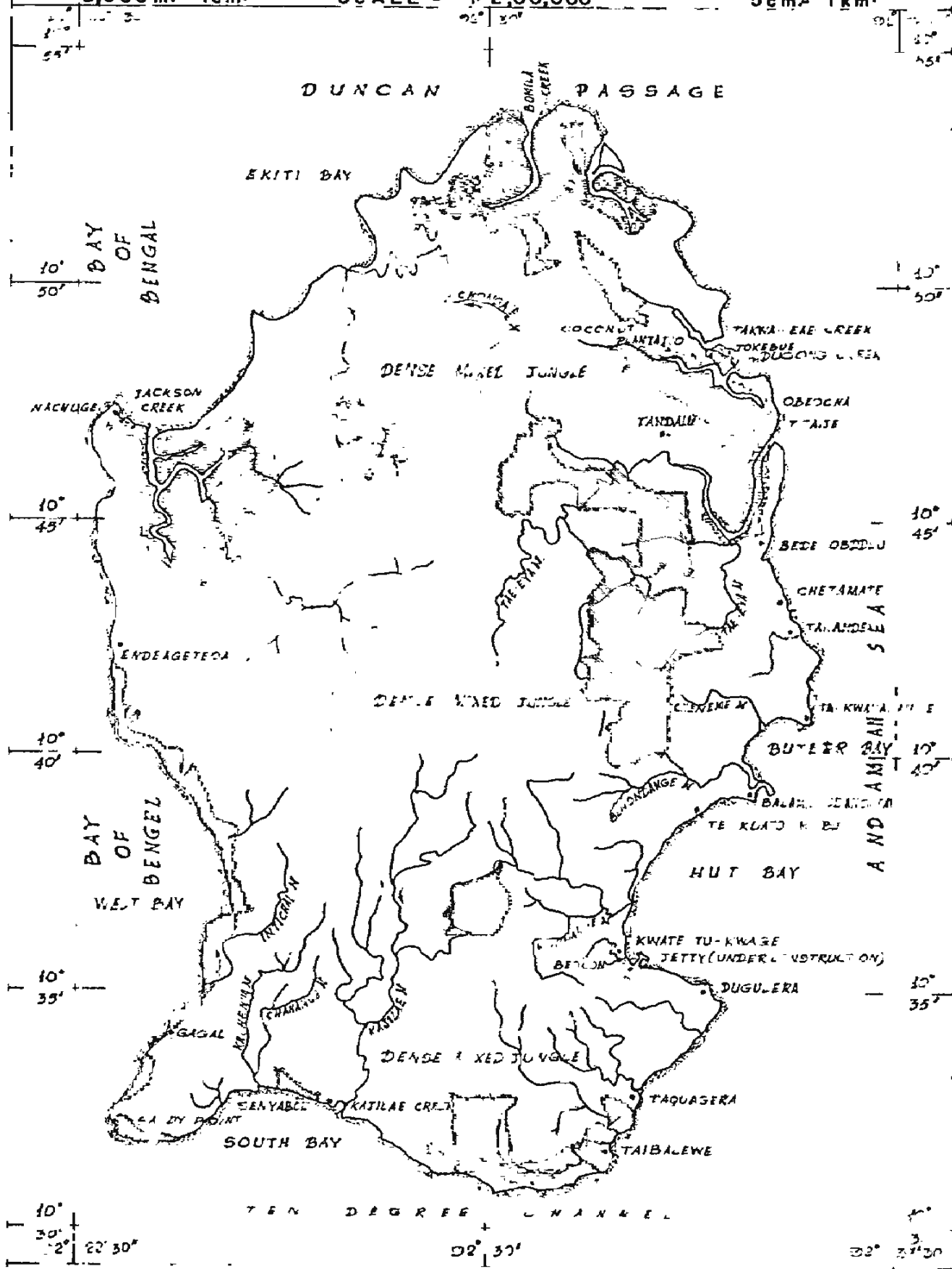
- I. Dipterocarpus alatus, D. pilosus, Terminalia bialata, T. procera, Salmalia insignis, Artocarpus chaplasha, Albizia lebbek, Pterocymbium tinctorium, Sideroxylon langepetalatum, Tetrameles nudiflora.
- II. Myristica species, Pometia pinnata, Pisonia excelsa, Dillenia pentagyna, Xanthophyllum andamanicum, Talauma andamanica.
- III. Clerodendrum viscosum, Leea indica, Saporsma ternatum.
- IV. Dinochloa andamanica, Calamus andamanicus, C. pseudorivallis, C. palustris, Korthalsia laciniosa, Combretum extensum, Plecospermum andamanica.



# LITTLE ANDAMAN (Showing the Forest Area)

2,000 m. = 1 cm.

SCALE = 1:2,00,000

5 cm = 1 km.



MOIST DECIDUOUS FOREST   
 TIDAL SWAMP FOREST 

LITTORAL FOREST   
 EVER GREEN FOREST 

DRAWN BY "SUN"

2.3.3 Andaman Moist Deciduous Forests (3A/ci)

This type of forest is not commonly encountered in Little Andaman as major portion of this Island is covered by Evergreen and Semi-evergreen type of forest. However, there are few patches of this type mostly confined in the central part of Island along the west slope of the hill. In this type the evergreen and deciduous species are very much mixed though major portion of the top canopy is often occupied by deciduous species. Distinct second and third storeys are present. The undergrowth is dense and is composed of evergreen shrubs. Climbers are heavy and canes are profuse. Bamboos are absent except in two or three small patches at the northern part of the hills where patches of Bambusa lineata is seen.

Floristic composition

- I. Terminalia bialata, T. manii, T. procera, Salmalia insignis, Pterocymbium tictorium, Dipterocarpus pilosus, Tetrameles nudiflora, Albizia lebbek, Lagerstroemia hypoleuca.
- II. Dillenia pentagyna, Semicarpus species, Cinnamomum species, Pterospermum aceroides, Iannea coromandalica, Cratoxylon formosum.
- III(a) Bambusa lineata.
- III. Myrraya paniculata, Ixora grandifolia, Clorodendrum viscosum, Glycosmis pentaphylla.
- IV. Calamus species, Entada phaseoloides, Harrisonia hrownii.

2.3.4 Littoral Forest (4A/Li)

This type of forest forms a thin border link almost all along the coast line except where it penetrates as creek or where small ridges terminate in the sea shore. Casuarina often forms the top storey along with Manilkara, Azalia and a few other evergreen or deciduous species. Casuarina in certain places is replaced by Manilkara. These form almost gregarious patches. Second storey is almost blank in land though the tree along the shore does not grow beyond 10 to 12 m. in height and forms the second storey. Undergrowth is tangled shrubby growth and often twined by thorny creepers. On the sandy beaches above the high water line thick carpet of Ipomea pescaprea is seen.

Floristic composition

- I. Casuarina equisetifolia, Manilkara littoralis, Salmalia insignis, Azalia bijuga, Terminalia catappa, T. bialata.
- II. Barringtonia asiatica, Erythrina variegata, Calophyllum inophyllum.

- III. Pongamia pinnata, Thespesia populnea, Hibiscus tiliacias, Hernandia peltata.
- III(a) Pandanus tictorius, Phoenix paludosa, Heritiera littoralis.
- IV. Ipomoea peescaprae, Vigna retusa.
- V. Colabrine asiatica, Ixora species, Cycas rumphii.

2.3.5 Mangrove forests (4B/Ts2)

This type of forest is seen along the sheltered shore of bays and inland creeks. The width of this type of forest varies and is mostly confined to Northern part of the Island where three big creeks almost covers the entire area. Besides, there are a few small patches on the Eastern and Southern coast. West coast being generally rocky has very little creek except Jackson creek at the north. This type of forest hardly grows beyond 12 to 15 m. in height though there may be thin line formed of higher trees at the off-side from creek. The crown is thickly closed and the undergrowth is totally nil. The composition is gregarious and often composed of Rhizophora and Bruguiera species. Nipa fruticans are often seen along the water up-streams. Stilt root of Rhizophora and knee roots of Bruguiera forms a tangled mass of root and makes it difficult for anybody to enter the Forest. Epiphytes and Orchides are common.

Floristic composition

- (i) Bruguiera conjugata, Rhizophora mucronata, R. candilaria, Bruguiera parviflora, Avicennia officinalis, Nipa fruticans, Phoenix paludosa, Sonneratia cascolaris, Areca triandra.

2.3.6 Myristica swamp forest (4c/Fsi)

Besides tydal swamp there are many small patches of sweet water swamps in Little Andaman. These swamps are caused by periodical flooding of the low lying area along the streams the months of which get blocked seasonally by shifting of sand of the beaches. In certain places it forms a permanent swamp and in certain other places these swamps get dried up during summer. Forest in such swamps comprises of pure stand of Myristica and Barringtonia species often in association of Pisonia excelsa, Heritiera species and Pandanus species. In saline and partly saline localities Phragmites, Spinifex and Phoenix are associates and form tangled growth, In swamps undergrowth is almost nil excepting a few canes.

Floristic composition

- I. Myristica irya, M. andamanica, Barringtonia racemosa, Pisonia excelsa.
- II. Heritiera littoralis, Pandanus tectorius, Dracaena angustifolia, Phoenix paludosa.
- III. Phragmites karka, Spirifex species, Licuala spinosa.
- IV. Calamus species, Plecosperrum andamanicum.

Note:- This type of forest was not reported earlier from Andamans.

2.3.7 Bamboo brakes

These occur throughout evergreen forests along the streams or as under-storey with Dipterocarpus species. Other associates are Oxytenanthera microciliata and Bambusa schizostachoides.

2.3.8 Cane brakes :

It occurs ~~ix~~ throughout Evergreen, Smi-evergreen and moist deciduous forests; Common species are - Calamus patustris, Calamus pseudorivelis and Calamus longistatus.

2.4 Distribution of Forest Resources :

The result of Pre-investment Survey Of Forest Resources, Eastern Zone, Calcutta shows the following distribution :-

No. of stems per hectare by species-wise and stratawise.

Sl.No.	Name of the species	Evergreen	Deciduous	Littoral
<u>Plywood species</u>				
1.	<u>Dipterocarpus species</u>	5.849	9.181	-
2.	<u>Amora wallichii</u>	0.460	-	0.565
3.	<u>Parishia insignis</u>	0.819	1.017	-
4.	<u>Terminalia bialata</u>	0.945	1.244	1.358
5.	<u>Terminalia procera</u>	2.162	2.164	1.131
<u>Matchwood species</u>				
6.	<u>Canarium euphyllum</u>	0.909	1.244	-
7.	<u>Endospermum melaccensis</u>	0.104	0.113	0.113
8.	<u>Anthocaphalus cadamba</u>	0.854	2.831	0.113
9.	<u>Salmalia insignis</u>	1.874	2.378	0.906
10.	<u>Sideroxylon langetiolatum</u>	6.977	6.121	4.533
11.	<u>Pterocymbium tinctorium</u>	4.953	3.739	4.305
<u>Constructional wood species</u>				
12.	<u>Artocarpus chaplasha</u>	4.721	7.820	1.018
13.	<u>Artocarpus lakoocha</u>	0.927	-	1.246
14.	<u>Hopea odorata</u>	-	0.113	-
15.	<u>Pajanelia longifolia</u>	0.316	0.566	-
16.	<u>Adenanthera pavonina</u>	0.173	0.226	-
17.	<u>Planchonia andamanica</u>	2.071	2.492	0.226
18.	<u>Diploknema butyracea</u>	0.872	0.792	0.906
19.	<u>Mesua ferrea</u>	-	-	-
20.	<u>Lannea coromandelica</u>	0.408	0.339	-
21.	<u>Lagerstroemia hypoleuca</u>	0.549	0.113	0.113
22.	<u>Terminalia manii</u>	0.315	0.565	-
23.	<u>Calophyllum inophyllum</u>	1.302	1.019	0.565
24.	<u>Manilkera littoralis</u>	0.070	-	-
25.	<u>Albizzia lebbek</u>	0.121	0.226	-

Sl.No. Name of the species Evergreen Deciduous Littoral

Ornamental wood species

26.	<u>Terminalia bialata</u>	-	-	-
27.	<u>Segeraea elliptica</u>	-	-	-
28.	<u>Diospyros marmerata</u>	0.141	0.226	-
29.	<u>Murraya paniculata</u>	-	-	0.226
30.	<u>Podocarpus nerifolia</u>	0.124	-	-

53. Non-commercial wood species

31.	<u>Myristica species</u>	11.432	8.391	4.419
32.	<u>Duabanga sonneratioides</u>	-	-	-
33.	<u>Albizzia stipulata</u>	0.085	-	0.113
34.	<u>Mangifera <del>sp</del> A andamanica</u>	0.103	0.226	-
35.	<u>Evodia glabra</u>	0.017	-	-
36.	<u>Alianthus kurzii</u>	-	-	-
37.	<u>Alstonia scholaris</u>	0.244	0.226	0.678
38.	<u>Tetrameles nudiflora</u>	0.443	0.566	0.339
39.	<u>Pterygota alata</u>	-	0.113	-
40.	<u>Garcinia species</u>	-	-	-
41.	<u>Gmelina arborea</u>	-	-	-
42.	<u>Sterculia villosa</u>	0.731	1.132	0.792
43.	<u>Spondias mangifera</u>	0.139	-	-
44.	<u>Nauclea gegeana</u>	0.247	0.339	0.340
45.	<u>Pometia pinata</u>	0.016	8.955	1.809
46.	<u>Antiaris toxicaria</u>	0.212	-	0.113
47.	<u>Eugenia species</u>	0.623	0.226	2.606
48.	<u>Ganophyllum falcatum</u>	0.353	0.339	0.452
49.	<u>Terminalia catappa</u>	0.086	-	-
50.	<u>Milusa tectona</u>	0.836	1.926	0.113
51.	<u>Aglaia andamanica</u>	0.874	1.927	0.226
52.	<u>Xanthophyllum andamanicum</u>	3.147	3.626	-
53.	<u>Elaeocarpus species</u>	-	-	-
54.	<u>Bischofia javanica</u>	-	-	-
55.	<u>Dillenia pentagyna</u>	0.334	0.226	-
56.	<u>Artocarpus gomeziana</u>	0.105	0.113	-
57.	<u>Hibiscus tiliaceus</u>	-	-	-
58.	Others	66.010	68.264	52.099

2.4.1 Estimation of stems (.000 units) by species wise and strata wise.

Sl.No.	Name of the species	Evergreen	Littoral	Deciduous	Percentage of stems
<u>Plywood species</u>					
1.	<u>Dipterocarpus species</u>	340.922	-	52.263	4.50 %
2.	<u>Amoora wallichii</u>	26.808	0.751	-	0.30 "
3.	<u>Parishis insignis</u>	47.734	-	5.787	0.60 "
4.	<u>Terminalia bialata</u>	55.079	2.409	7.079	0.70 "
5.	<u>Terminalia procera</u>	126.016	1.507	12.884	1.60 "
<u>Match wood species</u>					
6.	<u>Canarium euphyllum</u>	52.980	-	7.079	0.69 "
7.	<u>Endospermum melaccense</u>	6.060	0.150	0.643	0.07 "
8.	<u>Anthocaphalus cadamba</u>	49.475	0.150	16.114	0.76 "
9.	<u>Bombay insigne</u>	109.227	1.358	13.535	1.42 "
10.	<u>Sideroxylon longepetio- latum</u>	406.671	6.035	31.616	5.09 "
11.	<u>Pterocephalum tinctorium</u>	288.696	5.748	21.281	3.61 "
12.					
<u>Constructional wood species</u>					
12.	<u>Artocarpus chaplasha</u>	275.173	1.357	44.514	3.70 "
13.	<u>Artocarpus lakoocha</u>	54.029	1.663	-	0.63 "
14.	<u>Hopea odorata</u>	-	-	0.643	0.03 "
15.	<u>Palaemonia longifolia</u>	18.415	-	3.221	0.60 "
16.	<u>Adenanthera pavonia</u>	10.080	-	1.286	0.13 "
17.	<u>Planchonia andamanica</u>	120.711	0.300	14.184	1.54 "
18.	<u>Diploknema butyracea</u>	50.824	1.209	4.507	0.60 "
19.	<u>Messua ferrea</u>	-	-	-	-
20.	<u>Lennea coromandalica</u>	23.779	-	1.929	0.29 "
21.	<u>Lagerstroemia hypoleuca</u>	31.996	0.150	0.643	0.37 "
22.	<u>Terminalia mani</u>	18.357	-	3.215	0.24 "
23.	<u>Calophyllum inophyllum</u>	75.888	0.751	5.799	0.90 "
24.	<u>Manilkara littoralis</u>	5.069	61.502	-	0.76 "
25.	<u>Albizia lebbek</u>	7.050	-	1.286	0.09 "
<u>Ornamental wood species</u>					
26.	<u>Terminalia bialata</u>	-	-	-	-
27.	<u>Sageraea elliptica</u>	-	-	-	-
28.	<u>Diospyros marmorata</u>	8,217	-	1,286	0.10 "
29.	<u>Murraya paniculata</u>	-	0,301	-	Neglected
30.	<u>Podocarpus nerifolia</u>	7,227	-	-	0.008 "

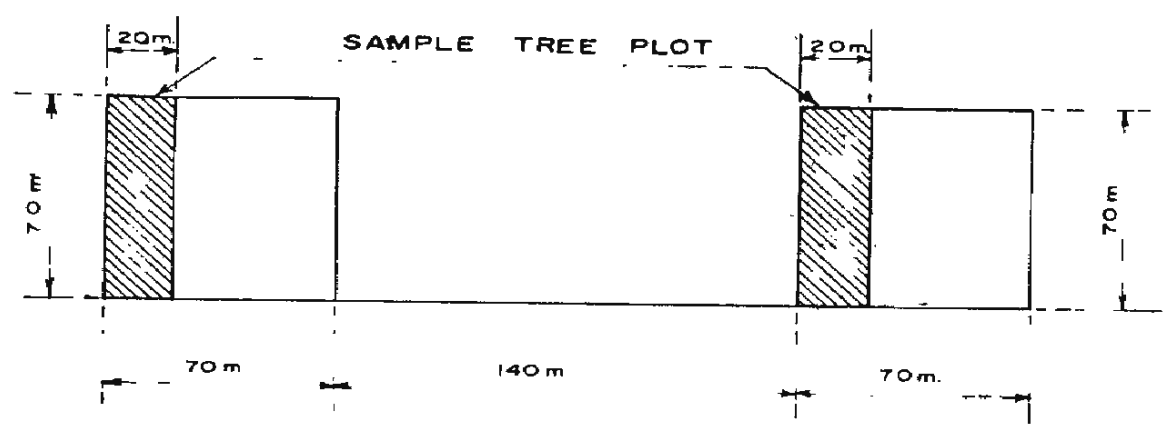
Sl.No.	Name of the species	Evergreen	Littoral	Deciduous	Percentage of stems.
31.	<u>Non-commercial wood species</u>				
31.	<u>Myristica species</u>	666.344	5.902	47.768	8.20 %
32.	<u>Duabanga grandiflora</u>	-	-	-	-
33.	<u>Albizzia stipulata</u>	4.950	0.150	-	0.58 "
34.	<u>Mangifera andamanica</u>	6.000	-	1.286	0.08 "
35.	<u>Evodia glabra</u>	0.990	-	-	0.01 "
36.	<u>Alianthus kurzii</u>	14.219	-	-	0.16 "
37.	<u>Alstonia scholaris</u>	25.819	0.901	1.286	0.30 "
38.	<u>Tetrameles nudiflora</u>	-	0.450	3.864	0.40 "
39.	<u>Pterygota alata</u>	-	-	0.643	Neglected
40.	<u>Garcinia species</u>	-	-	-	-
41.	<u>Cassia Gmelina arborea</u>	-	-	-	-
42.	<u>Sterculia villosa</u>	42.606	1.056	6.443	0.57 %
43.	<u>Spondias mangifera</u>	8.099	-	-	0.09 "
44.	<u>Naulea gegeana</u>	14.394	0.454	1.929	0.19 "
45.	<u>Pometia pinata</u>	525.520	2.409	50.976	6.60 "
46.	<u>Antiaris toxicaria</u>	12.355	0.150	-	0.14 "
47.	<u>Eugenia species</u>	36.311	3.479	1.286	0.47 "
48.	<u>Ganophyllum falcatum</u>	20.573	0.600	1.929	0.26 "
49.	<u>Terminalia catappa</u>	5.010	-	-	0.05 "
50.	<u>Milusa tectona</u>	48.724	0.150	10.961	0.68 "
51.	<u>Aglaia andamanica</u>	50.942	0.300	10.968	0.71 "
52.	<u>Xanthophyllum andamanicum</u>	183.430	-	20.639	2.30 "
53.	<u>Elaeocarpus species</u>	-	-	-	-
54.	<u>Bischofia javanica</u>	-	-	-	-
55.	<u>Dillenia pentagyna</u>	19.465	-	1.286	0.20 %
56.	<u>Artocarpus yomeziana</u>	6.119	-	0.643	0.07 "
57.	<u>Hibiscus tiliaceus</u>	-	-	-	-
58.	Others	3847.586	65.592	388.622	49.30 "

The result of the present survey have been enumerated in the table No. 3.1, 3.2, & 3.5 which showed detailed estimations of stem by species diameter class-wise for different strata. A summary of such findings is given below :-

STRATUM AND CATEGORY-WISE DISTRIBUTION

	Stems per hectare by stratawise			Estimation of stems by strata-wise.		
	<u>Evergreen</u>	<u>Deciduous</u>	<u>Littoral</u>	<u>Evergreen</u> (in .000 Nos.)	<u>Deciduous</u> (in .000 Nos.)	<u>Littoral</u> (in .000 Nos.)
Plywood	10.235	13.606	3.054	596.559	78.013	4.667
Matchwood	15.671	16.426	9.970	915.109	90.267	13.459
Constructional wood	11.862	14.271	50.112	691.371	81.227	66.932
Ornamental wood	0.265	0.226	0.226	15.444	1.286	0.301
Non-commercial wood	95.037	96.595	64.099	5539.456	550.529	81.593

LAY OUT OF PLOTS IN GRID CENTRE  
(LITTLE ANDAMAN)



It has been found that in Evergreen forest of Little Andaman Myristica species, Sideroxylon lansepetiolum, Dipterocarpus species, Artocarpus chaplasha, Xanthophyllum andamanicum, Terminalia procera are few widely occurring species numerically. Of the Evergreen species Myristica species surpass others in abundance with a density of 11.432 stems per hectare; volume, Gurjan surpasses all other species with a volume of 23.560 m<sup>3</sup> per hectare.

In Littoral forest Manilkara littoralis, Sideroxylon lansepetiolum, Myristica species and Pterocymbium tinctorium are numerous in number. The occurrence of Manilkara littoralis is greater than other species with 46.038 stems and a volume of 115.776 m<sup>3</sup>/ha.

In deciduous forest Dipterocarpus species, Pometia pianata, Terminalia procera, Myristica species, Artocarpus chaplasha, Sideroxylon lansepetiolum, Pterocymbium tinctorium are numerous in number. The occurrence of Dipterocarpus species is greater than all other species with 9.181 stems and a volume of 34.459 m<sup>3</sup>/ha.

The Andaman & Nicobar Forest and Plantation Development Corporation Limited in their survey (10% enumeration over 428 = 89km ) observed that the commercial timber is 75 m<sup>3</sup> per ha. of which plywood 3 is 37 m<sup>3</sup> (50% approx.) Matchwood 19 m<sup>3</sup> (25% approx.) and Saw logs 19 m (25% approx.); Gurjan accounted 60% Plywood volume.

## 2.5 Inventory design :

The basic object of the present study is to estimate the standing volume of the forest crop in the Island within 10% precision limit. A stratified random sampling with a cluster of 2 plots was adopted.

### 2.5.1 Size, number and location of plots :

The forest type met within Little Andaman have been already discussed in para 2.3. They have been found to form the following types on the basis of composition, growth and density.

- i) Swamps
- ii) Littoral Forests
- iii) Moist Deciduous Forests
- iv) Evergreen & Semi-evergreen Forests.

The semi-evergreen type has been merged with evergreen type as the former hardly differs in composition, growth and density with the latter.

#### Code for strata/types.

0 1	Swamps
0 2	Littoral forests
0 3	Moist Deciduous forests
0 4	Evergreen & Semi-evergreen forest.

A strata map was prepared from the interpretation of aerial photos. On ground check this was found to be more or less correct except in stratum 1, where tidal swamp could not be differentiated from the sweet water swamps. Since no survey was done in the swamp areas which are mostly covered by mangrove forests, this did not any way effect this survey. Belts of littoral forests of less than 100 m. width were not be properly delineated and therefore, not surveyed.

Working Plan Division of Andaman Forest Department had carried out resources survey in this Island by systematic enumeration with an intensity of about 10%. They covered the entire area of Little Andaman in four years beginning in 1970. The data of this survey was used for calculation of number of grids to be surveyed without having a forest pilot survey done.

Total number of grids to be surveyed was calculated to 76 which were distributed stratum-wise as under.

Strata	Area (in ha.)	Distribution of grids	No. of grids actually surveyed.
Littoral	1336	8	9
Deciduous	5693	12	9
Evergreen	58288	56	57
<b>T O T A L</b>	<b>65317</b>	<b>76</b>	<b>75</b>

Plot size.

The size of the plot adopted was 0.49 ha. in square shape each side of which was 70 m. Depending on the previous experiences and results of survey carried out elsewhere the size of each plot was fixed at 0.49 ha. (i.e. 70 m. x 70 m.) within a grid block of 1 km. For economising the expenses, a cluster of two plots at a distance of 140 m. was adopted (Refer to Diagrams).

2.6 Field work :

A field manual had been drawn up and detail procedures of field work were worked out.

Plots were laid out as shown in the diagram. The data collected in the field were filled in, various field forms such as Plot Approach, Plot Description, Plot Enumeration, Sample Tree & Volume and Cull Study.

2.7 Data processing :

The data processing operations are mainly concerned with processing of inventory. It involves a series of steps starting with the documentation of the field form followed by Manual checking, punching and verification of the data, computer, editing and correction of the data.

2.7.1. Felled tree volume.

Volume of each log of utility classes I, II and III (upto 20 cm.) diameter overbark of felled sample trees was calculated by applying Smalian's formula :-

$$V = \frac{\pi/4 (D_1^2 + D_2^2)}{2} \times L.$$

Where  $D_1$  and  $D_2$  are average o.b. diameter for o.b. volume and u.b. diameter for u.b. volume of the two ends of the logs. In case of small wood measurement (20 cm. d.o.b. to 5 cm. d.u.b.) only one measurement of mid-diameter was taken. The volume of each section was calculated by Huber's formula.

$$V = \frac{\pi D^2 L}{4}$$

Where  $D$  = diameter over bark at mid-point of logs.  
 $L$  = Length of the section.

The trees were felled flushed to be ground and logging waste was kept minimum. The volume of each log was calculated over and under bark for each tree. A total of 648 trees belonging to 26 species were felled for the study of volume equation keeping in view that each diameter class was adequately represented.

Andaman Forest Department desired to the volume tables for fourteen important species and one for all other species grouped together. As such the felling of trees of these species only was taken up. Besides, for preparation of an omnibus volume table some more species were also decided to be felled. The following chart shows the number of trees felled in each diameter class for volume study.

Sl. No.	Code	Name of species	Local name	Botanical name	No. of trees diameter classes																	Total Nos.
					20-29 cm.	30-39 cm.	40-49 cm.	50-59 cm.	60-69 cm.	70-79 cm.	80-89 cm.	90-99 cm.	100-109 cm.	110-119 cm.	120-129 cm.	130-139 cm.	140-149 cm.	150-159 cm.	160-169 cm.	170-180 cm.		
1	2		3		5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1	01	Gurjan		Dipterocarpus species	3	7	1	6	3	3	3	3	5	2	1	4	-	4	2	1	1	49
2	05	Badam		Terminalia procera	3	4	8	2	5	3	5	2	3	4	2	-	-	-	-	-	-	41
3	04	M.Chuglam		T. bialata	3	2	7	5	2	4	1	3	4	1	1	5	-	-	-	-	-	38
4	22	B.Chuglam		T. manii	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1
5	11	Papita		Pterocymbium	3	1	6	3	3	3	6	-	4	1	-	-	-	-	-	-	-	30
6	09	Didu		Salmalia insignis	1	6	6	1	6	3	4	4	2	2	4	2	1	4	1	1	1	49
7	06	W.Dhup		Canarium euphyllum	5	2	4	2	4	1	3	4	5	1	4	1	1	-	-	-	-	37
8	12	Tong Pein		Artocarpus chaplasha	2	9	3	7	4	3	1	1	-	3	2	1	-	-	-	-	-	41
9	17	R.Bomowe		Planchonia andamanica	4	10	5	4	4	3	3	2	1	2	-	-	-	-	-	-	-	38
10	24	Sea Mohwa		Manilkara littoralis	3	2	2	3	6	-	1	4	3	1	2	-	-	-	-	-	-	27
11	38	Thitpok		Tetrameles nudiflora	-	-	-	-	-	3	-	-	-	3	-	-	1	1	1	4	1	17
12	08	Kadam		Anthocephalus cadamba	2	3	1	1	-	-	1	-	-	-	-	-	-	-	-	-	-	8
13	10	Lambapatti		Sideroxylon longepetiolatum	6	7	6	8	4	3	3	1	3	2	-	-	-	-	-	-	-	43
14	15	Jhingan		Panjnelia longifolia	2	3	9	7	5	4	3	3	1	-	-	-	-	-	-	-	-	37
15	45	Thitkandu		Pometia pinata	1	3	2	1	2	4	1	1	3	1	1	1	3	2	3	1	-	30
16	47	Jamun		Syzygium species	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	2
17	50	J.Sagawan		Milusa tectona	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1
18	13	Lakuch		Artocarpus lakoocha	7	7	10	4	-	3	2	3	-	-	-	-	-	-	-	-	-	36
19	18	Hill Mohwa		Diploknema butyracea	5	4	4	6	4	4	1	-	-	-	2	-	-	-	-	-	-	30
20	23	Poon		Calophyllum inophyllum	7	8	6	2	1	1	1	2	-	-	-	-	-	-	-	-	-	28
21	31	Jaiphal		Myristica species	10	4	9	10	4	4	5	-	3	2	-	-	-	-	-	-	-	51
22	58	Others		-	-	-	-	2	1	1	2	-	-	1	2	1	1	1	-	-	-	12
23	20	Nabco		Lannea coromandelica	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2

2.7.2 Cull volume :

The cull volume was determined in case of each tree felled and was expressed as percentage of total under bark volume with reference to the corresponding d.b.h. The data were tabulated species-wise. It was found that distribution of cull in different species does not follow any definite pattern corresponding to the diameter class. Hence, this data of cull percentage were plotted against diameter of a particular tree irrespective of species and a smooth curve was drawn. The cull percentage corresponding to net value of each diameter class was computed and tabulated as below :-

Diameter class	Cull (% total U.B.) volume
10 - 19	-
20 - 29	0.1 %
30 - 39	0.2 %
40 - 49	0.4 %
50 - 59	0.8 %
60 - 69	1.1 %
70 - 79	1.4 %
80 - 89	1.7 %
90 - 99	2.3 %
100 and above	2.6 %

2.7.3 Bark volume :

The over bark and under bark volume in each case was summed up separately and the difference in volume was found out and expressed as percentage of total under bark to give the percentage of bark, for a particular tree. This constitutes the bark percentage for a particular tree of certain diameter classes. For each species, under different diameter classes, bark percentage was calculated and tabulated as in Table No. 13.0.

2.7.4 General volume equations :

No comprehensive volume table exists for the timber in Little Andaman. Basic information required for a sample regression equation correlating the measured volume of the trees with their diameter at breast height and total height were available from felled trees.

General volume equation tried for "Little Andaman"  
are as under :-

1.  $V = a + bD^2H$
2.  $V/D^2H = a + b/D^2H$
3.  $V = a + bD + cD^2H$
4.  $V = a + bD^2H + cH$
5.  $V/D^2 = a + b/D^2 + cH$
6.  $V = a + bD^2H + cD/\sqrt{H}$

When V = U.B. volume (m<sup>3</sup>) upto 5 cm. top - O.B. diameter.  
D = Diameter (in cm.) at breast height.  
H = Height (m.), a, b, c, d, being constants and regression co-efficient.

Selected general volume equations.(Little Andaman)

Species Code	Name of the species	Equations
1 ✓	Dipterocarpus species	$V/D^2H = 0.0000249 + 0.2126/D^2H$
4 ✓	Terminalia bialata	$V/D^2H = 0.0000249 + 0.1597/D^2H$
5 ✓	Terminalia procera	$V/D^2 = 0.00050 - 0.02415/D^2 + 0.0000148H$
6 ✓	Canarium cupyllum	$V/D^2 = -0.000615 - 0.0468/D^2 + 0.0000139H$
9 ✓	Salmalia insignis	$V/D^2 = 0.0001964 - 0.000000084/D^2 + 0.0000187H$
10 ✓	Sideroxylum longepetiolatum.	$V/D^2H = 0.0000264 + .11295/D^2H$
11 ✓	Pterocymbium tinctorium	$V/D^2 = -0.000036 + 0.02059/D^2 + 0.0000268H$
12 ✓	Artocarpus chaplasha	$V/D^2H = 0.00002417 + 0.2275/D^2H$
13 ✓	Artocarpus lakoocha	$V/D^2H = 0.12951/D^2H + 0.0000272$
15 ✓	Pajanelia longifolia	$V = 0.4257 + 0.0000205 D^2H$
17 ✓	Planchonia andamanica	$V/D^2H = 0.0000215 + 0.37271/D^2H$
18 ✓	Diploknema butyracea	$V/D^2H = 0.00003091 + 0.14932/D^2H$
23 ✓	Calophyllum inophyllum	$V/D^2H = 0.000038 + 0.05188/D^2H$ ✓
24 ✓	Manilkara littoralis	$V/D^2H = 0.000029 + 0.08632 /D^2H$
25 ✓	Others	$V/D^2H = 0.19915/D^2H + 0.000022$

Local volume equation :

The following types of regression equations were tried to obtain the local volume equation of best model.

$$\begin{aligned} V &= a + bD + cD^2 \\ V &= a + bD^2 \\ V/D^2 &= a + b/D^2 + c/D \\ V/D &= a + b/D + cD \\ V &= a + bD + c\sqrt{D} \end{aligned}$$

Out of various local volume equations tried the following local volume equations were selected for different species which is given in the list below. The main criteria for selection of these equations are (i) the standard error of estimate (ii) the multiple determinant co-efficient and (iii) range of applicability of the equation.

Note :- The volume equations given above are valid for trees of 20 cm. d.b.h. (o.b.) and above as the minimum limit of d.b.h.(o.b.) for enumeration of trees was fixed at 20 cm. d.b.h.(o.b.)

SELECTED LOCAL VOLUME EQUATIONS

LITTLE ANDAMAN

Spp. Code	Name of the species	Equations
1 ✓	Dipterocarpus species	$V = 0.4723 - 0.0227D + 0.00108D^2$ ✓
4 ✓	Terminalia bialata	$V/D^2 = 0.62603/D^2 - 0.04926/D + 0.001733$ ✓
5 ✓	Terminalia procera	$V = -0.1843 + 0.00198D + 0.000936D^2$ ✓
6 ✓	Canarium euphyllum	$V = 1.2899 - 0.06598D + 0.00175 D^2$ ✓
9 ✓	Salmalia insignis	$= -.404 + .0126D + .000669D^2$ ✓
10 ✓	Sideroxylum longepetiolum	$V/D^2 = -0.03189/D^2 + 0.0059649/D + 0.0005834$ ✓
11 ✓	Pterocymbium tinctorium	$V = 0.00999 - 0.0154D + 0.0012D^2$ ✓
12 ✓	Artocarpus chaplasha	$V = 1.5897 - 0.0611D + 0.00162D^2$ ✓
13 ✓	Artocarpus lakoocha	$V = 0.1954 - 0.004028D + 0.000609D^2$ ✓
15 ✓	Pajanelia longifolia	$V/D^2 = -.4406/D^2 + 0.0158/D + 0.00083$ ✓
17 ✓	Planchonia andamanica	$V/D^2 = 0.4363/D^2 + 0.00082 - 0.0137/D$ ✓
18 ✓	Diploknema butyracea	$V/D^2 = 0.7124/D^2 - 0.045735/D + 0.0015$ ✓
23 ✓	Calophyllum inophyllum	$V/D = -.0844 + 1.327/D + 0.002219D$ ✓
24 ✓	Manilkara littoralis	$V = 0.0245 - 0.00497D + 0.000719D^2$ ✓
58 ✓	Others	$V = 1.0405 - 0.0589D + 0.001505D^2$ ✓

Note:- The volume equations given above are valid for trees of 20 cm. d.b.h.(o.b.) and above as the minimum limit of d.b.h.(o.b.) for enumeration of trees was fixed at 20 cm. d.b.h.(o.b.)

2.7.6 Tree volume and plot volume :

On the basis of the local volume equation described above, volume of each enumerated tree is obtained. Volume of all the enumerated trees in a plot when added up gives the plot volume.

TREE DENSITY STUDY.

Stand and stock tables

The number of stem per ha. by species and diameter for various strata is given in Table No. (1.1 - 1.15).

Similarly, the volume per ha. by species and diameter for each stratum was derived and given in Table No. (4.1 to 4.15).

Estimation of total No. of trees and total volume by species and diameter were obtained for each stratum and also for the entire project area (Table No. 2.1 - 2.15 and 5.1 to 5.15)

The utility volume per ha. for various categories of utility such as Ply, Match, Construction, Residual, Ornamental, and Small is shown in Table No. 6.0.

On the basis of these per ha. figures the estimate of for utility volume of various categories was carried out (Table No. 7.0):

2.7.7 Estimate of Error :

The error for various strata is given as below :-

Stratum	Area in hectare	Volume per hectare (m <sup>3</sup> )	Estimated volume (.000m <sup>3</sup> )	S.E. %
1. Littoral	1336	298.615	398.947	10.9055
2. Deciduous	5693	283.521	1614.084	7.7317
3. Evergreen	58288	265.999	15504.614	4.5142
<b>Total</b>	<b>65317</b>	<b>268.268</b>	<b>17517.645</b>	<b>6.6140</b>

2.7.8(a) Growing stock :

The estimated growing stock in Little Andaman is 17517.645 (.000 m<sup>3</sup>).

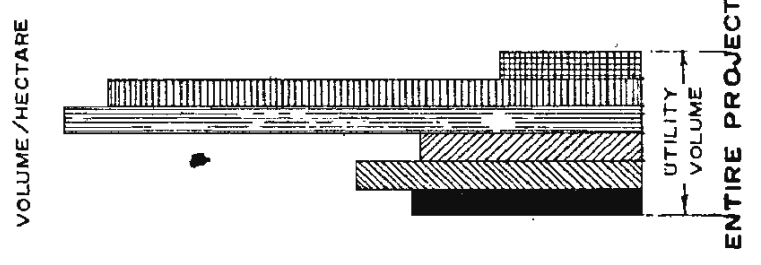
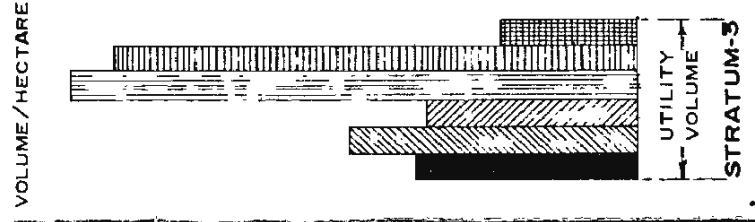
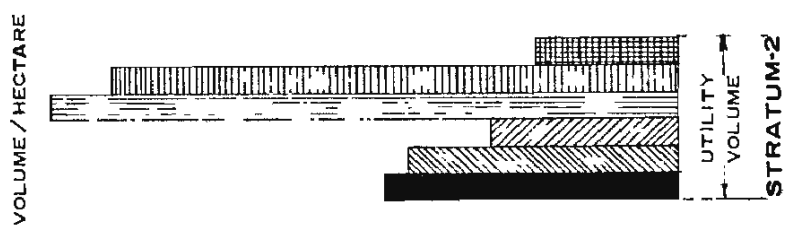
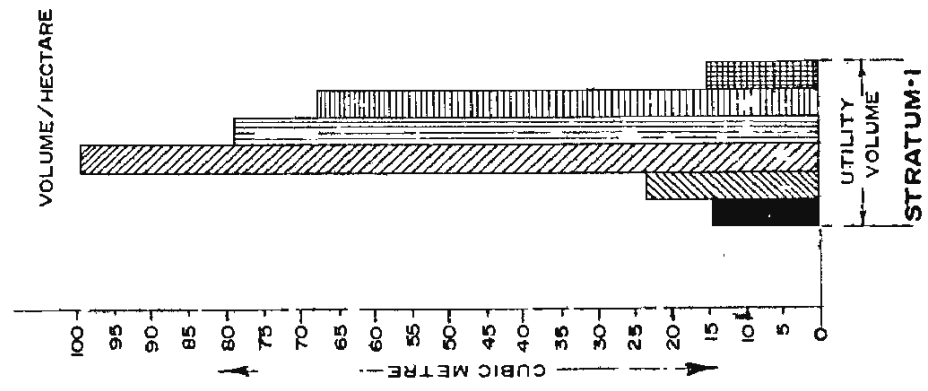
Strata-wise distribution of total growing stock is as under :-

Forests	Total underbark volume (in .000 m <sup>3</sup> )	Volume/ha.
1336 Deciduous	1614.084	283.521
5693 Evergreen	15504.614	265.999
58288 Littoral	398.947	298.615

GSP/27

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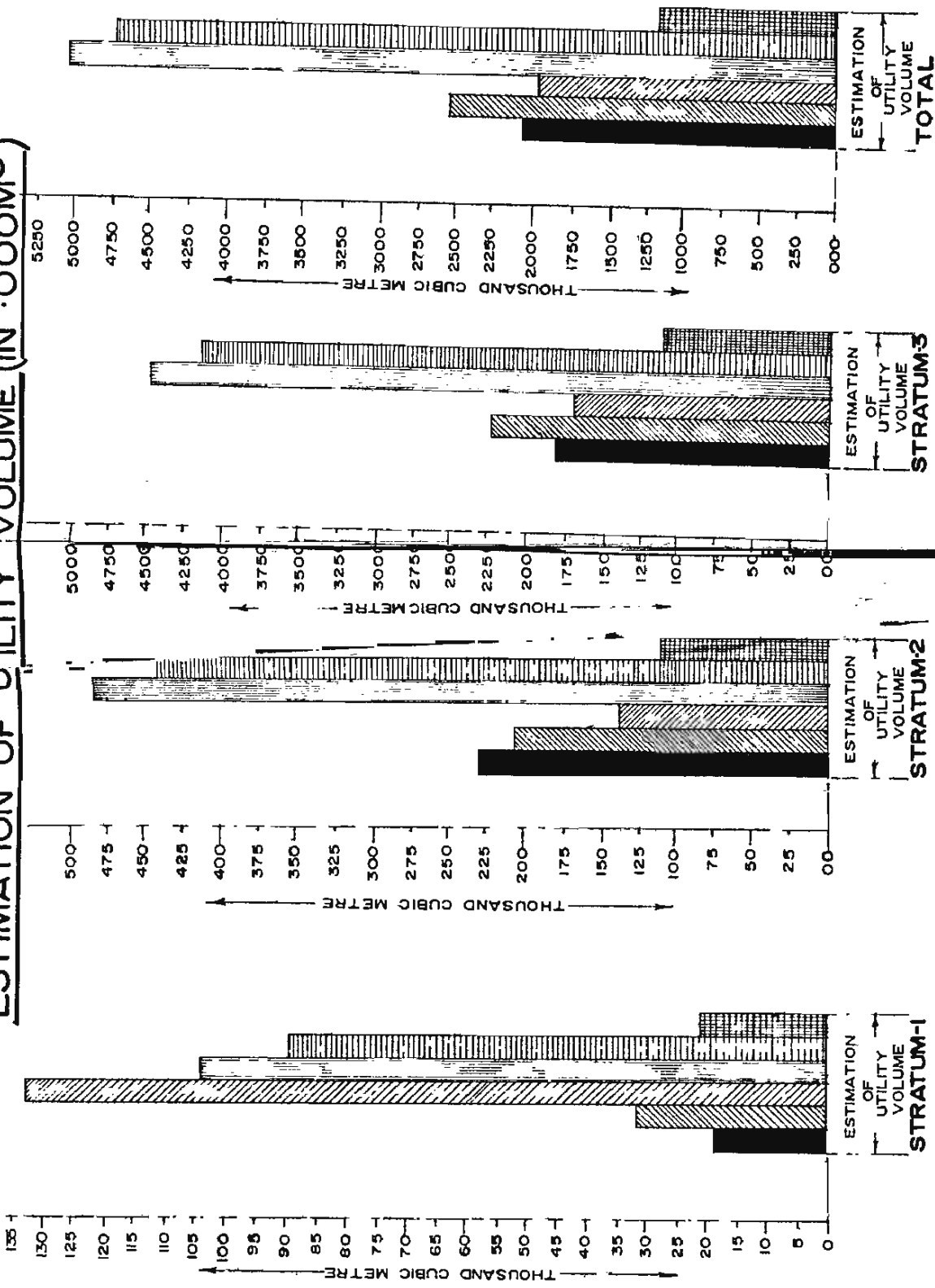
# UTILITY VOLUME / HECTARE IN M<sup>3</sup>.



## R E F E R E N C E S

STRATUM-1 - LITTORAL	PLYWOOD	NON COMMERCIAL
STRATUM-2 - DECIDUOUS	MATCHWOOD	WOOD
STRATUM-3 - EVERGREEN	CONSTRUCTIONAL WOOD	RESIDUAL WOOD
		SMALL WOOD

# ESTIMATION OF UTILITY VOLUME (IN 000M<sup>3</sup>)



## REFERENCES

STRATUM-1 - LITTORAL  
 STRATUM-2 - DECIDUOUS  
 STRATUM-3 - EVERGREEN

PLYWOOD  
 MATCH WOOD  
 CONSTRUCTIONAL WOOD

COMMERCIAL WOOD  
 RESIDUAL WOOD  
 SMALL WOOD

2.7.8(b) Utility class-wise break up of total growing stock for entire project area is as follows :-

Utility class	Total volume (in .000 m <sup>3</sup> )	Volume/ha. (m <sup>3</sup> )
Plywood	2036.241	31.174
Matchwood	2519.063	38.567
Constructional timber	1969.802	30.157
Residual	4722.461	72.301
Small wood	1195.567	18.304
Non-commercial	5070.407	77.628

The littoral stratum is better stocked and has maximum density per ha. (Volume).

204488  
137269  

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341757  

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170879  
20 160

8000  
cmt

C H A P T E R - III

MARKET STUDY & CONSUMPTION PATTERN

3.0 Marketing :

Owing to remoteness of forests, lack of communication and transport, marketing has been a problem. Various reports indicated that the lack of proper marketing system and procedure of Sal have been the principal reason for the slow growth.

At the moment the market demand is for selected species of trees. But gradually more and more species are being experimented for use in various industries. The demand is sure to increase in near future. The Calcutta Timber Markets had heavy demand for Gurjan, Padauk, Badam, White and Black Chuglam. The demand for Andaman timber is now more in South India than in Calcutta. The current policy of the Government is not of export of timber in long form and they have already put a ban on the export of timber.

As the Port of Andamans has been opened to foreign ship and export policy is likely to be liberalised, there must not be any difficulty in the export of timber. These facts have prompted the Forest Development Corporation to extract more than 19557 m<sup>3</sup> in 1978-79 and it is expected to go as high as 60,000 m<sup>3</sup>.

3.1 Demand Zone :

According to the available information at present 18 (eighteen) wood-based industries are functioning in Andaman and Nicobar Islands and their installed capacity is 1,05,500 m<sup>3</sup> per annum and these factories are fully dependent on local timbers.

There is a heavy demand of Andaman timbers by the Indian Railways. The present annual requirement of railways is given below :-

Sl.No.	Name of the species	Quantity required annually.
1.	Gurjan	10,000 m <sup>3</sup>
2.	Badam, White and Black Chuglam.	3,000 m <sup>3</sup>
3.	Padauk	2,000 m <sup>3</sup>
Total		= 15,000 m <sup>3</sup>

The total annual requirement of Matchwood timbers in India is 4.00 lakh m<sup>3</sup>. WIMCO alone required 1,43,000 m<sup>3</sup> of Matchwood timbers every year. Andaman timber can meet bulk requirement.

The Plywood and other wood-based industries of Calcutta till recently were mainly dependent on the timbers of Andaman and Nicobar Islands though a little quantity of timbers are supplied from North Bengal, Assam, Bihar, Orissa and Madhya Pradesh. Calcutta markets can consume about 55,000 m<sup>3</sup> of Andaman timber annually.

Sawn timber to the extent of about 10,000 m<sup>3</sup> is sold every year from the entire Forest Department. The department also sell 42,000 kgs. of Charcoal, 2,68,966 kgs. of Resin, 764915 Nos. of canes, 1,663,522 nos. of bamboos, 40940 m<sup>3</sup> fire wood to various inland and mainland agencies every year.

### 3.2 Future Demand Trend :

The National Commission on Agriculture in their interim report on "Production Forestry and Manmade Forests" have projected the following demand for wood in India.

Forest Product	Projected demand in .000 m <sup>3</sup> /annum	
	1980	1990
Sawn logs	12,649	- 17,010
Wood required for panel boards	943	- 1,408
<b>Total :</b>	<b>13,592</b>	<b>18,418</b>

The demand for pulp wood and round wood in the country as estimated by the National Commission on Agriculture is as follows :-

Forest product	Projected demand in .000 m <sup>3</sup>	
	1980	1990
Plywood	2,129	12,733
Logwood	6,927	9,595
<b>T O T A L :</b>	<b>9.056</b>	<b>22,328</b>

Besides, there is a great demand of certain Andaman species in foreign countries. So it can be assumed that the estimated extraction of timbers which have been planned by "The Andaman & Nicobar Forest & Plantation Development Corporation Ltd" will be thankfully welcomed by the various demand zones.

The Supply :

At present Little Andaman produce about 25,000 m<sup>3</sup> of logs per year and only one saw mill exists at Hut Bay which consumes 3 to 5 m<sup>3</sup> round hard wood logs per day. The whole Andaman Island's however, produce 1,50,000 m<sup>3</sup> of which about 17,000 m<sup>3</sup> is supplied to mainland and 45,000 m<sup>3</sup> to two local industries.

It has been lately reported that the saw mill has been closed down and a Match Splint & Veener Factory has also been established at Hut Bay with an annual intake of 10,000 m<sup>3</sup> of Match log and 2,000 m<sup>3</sup> of Saw logs.

Further, it is estimated that the following additional quantity of Andaman timbers will have to be supplied to the local (Islands) Industries to meet up with their expansion programmes.

W I M C O	6,000 m <sup>3</sup> /annum
Andaman Timber Industries	15,000 m <sup>3</sup> /annum
Jayashree Timber Products	25,000 -do-

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T O T A L = 45,000 m<sup>3</sup>/annum

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According to the plan this extra timber will be supplied from the South and Middle Andaman. As such this will not effect Little Andaman.

The inter Island supplies of wood are carried out generally through rafts, small sea-going vessels or barges in calm weather. The Forest Department uses a sea going flat bottomed 200 capacity self propelled barges whose speed varies from 6 to 9 knots. Most of the transport is now being done by the L.C.T.

Generally one raft can assemble six logs of about 6-7 m<sup>3</sup> Towing launches have 50 H.P. motors and can tow together 50-60 m<sup>3</sup> at a speed of 2-3 knots.

The Forest and Plantation Development Corporation Ltd. of Andaman and Nicobar Islands has taken up work over 6,800 hectares in Little Andaman and 9,755 ha. in North Andaman in ~~with~~ their 1st phase of operation. They will start their operation over 200 ha. in the 1st year to 2,245 ha. in the 5th year with a view to produce 15,000 m<sup>3</sup> in the 1st year to 120,000 m<sup>3</sup> in the fifth year.

The port of Hut Bay has a depth of 5 m. water where M.V. Yerawa, M.V. Andaman 2,000 dwt can berth regularly. Another berth inside the break water has been completed which has 7 m. depth of water and will be able to accommodate the ship similar to M.V. Diglipur of about 5,000 dwt. capacity.

Previously the Forest Department was dependent on one log loader viz. M.V. Shompen with a capacity of 2,000 m<sup>3</sup>. Big loaders were nominated occasionally by the Shipping Corporation Of India Limited.

Very recently the Shipping Corporation Of India Ltd. acquired M.V. Diglipur mainly for the transportation of timbers.

It has been estimated that from different sectors the availability of Pulpwood would be as follows :-

<u>North and Middle Andaman Group</u>	
Diglipur	130,000 m <sup>3</sup>
Maya-bunder	90,000 m <sup>3</sup>
M. Andaman	48,000 m <sup>3</sup>
Baratang	33,000 m <sup>3</sup>
<hr/>	
T O T A L =	3,01,000 m <sup>3</sup>
Little Andaman	1,00,000 m <sup>3</sup>
<hr/>	
Grand Total =	4,01,000 m <sup>3</sup>

With the expansion of the sphere of activity of the Andaman and Nicobar Forest and Plantation Development Corporation and construction of more roads, more and more quantity of timber would be available from Little Andaman.

#### 3.4 Consumption Pattern :

Taking Andaman Islands as a whole the present production is about 1,50,000 m<sup>3</sup>/annum of which Little Andaman share is 25,000 m<sup>3</sup>. Commercial wood is utilised in the Island about 70,000 m<sup>3</sup> and about 17,000 m<sup>3</sup> is exported to mainland. Further scope for consumption is limited in near future. It is possible to utilise substantial quantity of timber for local consumption for Calcutta & Madras Markets, Railways, DGS & D and Defence etc.

The consumption pattern in 1975-76 of the present produce was as follows :-

Ply wood	- 30,000 m <sup>3</sup>
Match wood	- 7,000 m <sup>3</sup>
Govt. Saw Mill	- 34,000 m <sup>3</sup>
Export to Indian	
Mainland	- 17,000 m <sup>3</sup>
Small Saw Mills	- 4,000 m <sup>3</sup>
Others	- 8,000 m <sup>3</sup>
<hr/>	
T O T A L =	1,00,000 m <sup>3</sup>

But this has increased to 1,50,000 m<sup>3</sup> in 1977-78.

According to the report published by the Food and Agriculture Organization of the United Nations the following market exists for disposing 3,00,000 m<sup>3</sup> of commercial wood per annum; this quality of timber is available in the whole of the Island including 1,00,000 m<sup>3</sup> from Little Andaman.

	<u>Particulars</u>	<u>Consumption m<sup>3</sup>/annum.</u>
1.	For existing consumption in the Islands.	1,00,000 m <sup>3</sup>
2.	For expansion of local industries in the Islands.	46,000 m <sup>3</sup>
3.	Supply to Calcutta Market.	55,000 m <sup>3</sup>
4.	Supply to Madras Market	25,000 m <sup>3</sup> .
5.	Supply to Government Department (Railways, DGS & D, Defence etc.)	50,000 m <sup>3</sup> .
6.	Other supplies	24,000 m <sup>3</sup> (Approx.)
	T O T A L =	<hr/> 3,00,000 m <sup>3</sup> <hr/>

C H A P T E R - IV

MANAGEMENT OPPORTUNITIES & POTENTIAL ANNUAL CUT

4.0 Forest Management :

The system adopted in mid-forties for felling trees was termed as "Andaman Canopy Lifting Shelter Wood System" which implied gradual removal of over mature trees. The commercial species are removed first, then the non-commercial species felled. In the first phase of their operation the commercial species would be removed and the following girth classes for different types of wood prescribed :-

<u>Girth at breast height (in cm.)</u>	<u>Wood class</u>
120 cm.	Soft wood
150 cm.	Hard wood
180 cm.	For other species.

In their second phase of operation fellings, brush wood cutting, girdling of undesirable species, the under growth and poles of non-commercial species upto 10 m. height would be felled and all such trees between 10-20 m. height girdled to attain an appropriate canopy of overhead light and shade. Unhealthy trees and trees having very small heart wood are also felled or girdled.

Systematic and proper Forest Management was limited to some commercial species. With the improvement of Saw Mill, Plywood and Matchwood industries some other species entered into the market. The Andaman and Nicobar Islands Forest & Plantation Development Corporation Limited has been established recently for better management of the forest. It would strike to evolve better methods of logging, plantation techniques make market studies and initiate promotional activities.

4.1 Regeneration :

The Andaman & Nicobar Forest and Plantation Development Corporation Ltd. has adopted regeneration of the annual harvested area by both natural or artificial means. It has been decided that 75% of the area harvested would be naturally regenerated by gradual lifting of canopy under "Andaman Canopy Lifting Shelter Wood System" that would cause least disturbance to the existing forests. The balance 25% area would be intensively regenerated by artificial means.

The removal of non-commercial species should be easily incorporated within the system of felling and regeneration. As a matter of fact, the removal of such less valuable species is likely to facilitate the regeneration operation in the area.

The following are plantation/regeneration plan of the Andaman and Nicobar Forest & Plantation Development Corporation Limited. :-

CHART ON PLANTATION/REGENERATION PLAN ADOPTED BY THE  
ANDAMAN AND NICOBAR FOREST AND PLANTATION DEVELOPMENT  
CORPORATION LIMITED (IN HECTARE)

Year	Particulars	Timber extrac- tion.	Area to be released for comm- ercial pl- antation.	Area to be relea- sed for rehabili- tation.	Forest Planta- tion.	Natural Regeneration.
1st	Little Andaman	200	100	100	-	-
2nd	-do-	400	200	100	-	400
3rd	-do-	600	400	100	-	100
4th	-do-	800	500	200	-	100
5th	-do-	800	600	100	-	100
6th	-do-	800	600	100	-	100
7th	-do-	800	-	-	200	600
8th	-do-	800	-	-	200	600
9th	-do-	800	-	-	200	600
10th	-do-	800	-	-	200	600

4.2 Growth Statistics :

Neither sufficient reliable nor extensive data are available to assess the growth of valuable species. Dena's Working Plan (1935-36) gives some reliable information of growth statistics. He ascertained diam./ages and volume relationship in Padauk, Gurjan, White Chuglam and Papita. Chengappa in his Working Plan also mentioned about such relationship. Dean also prepared diameter/volume curve from felling of many trees. The Silvicultural Division also prepared separate volume table for 15 species (for Middle & South Andaman). A growth of over 180 cm. g.b.h. was found in Padauk in 110 years and annual increment was assessed at 1.44 cm. Chengappa measured g.b.h. of 195 cm. at 150 years ages with an annual increment of 1.3 m. However, in his Working Plan the following girth and rotation were adopted.

Girth 150 cm. at b.h. for Padauk to be attained in 100 years and therefore, a rotation of 100 years was adopted. This can be adopted in case of Gurjan and other hardwood species.

4.3 Rotation and Conversion Period :

Data on rotation, either silvicultural or financial are lacking. From the available data in Working Plans and in Silvicultural Division, it would appear that Padauk and Gurjan wood reach girth of 150 cm. in 100 years. It is possible that they would grow faster if properly tended. Chengappa found that M.A.I. in Padauk starts falling after 100 years. As such there is a reliable indication that the rotation is not likely to be more than 100 years in Padauk and other timber species. In case of Soft wood rotation should be less than 100 years. But it is expected that plantation and assisted natural regeneration will give a faster growth to the crop. Moreover, Cull Study has indicated that trees of diameter 50 cm. and over develop marked defects.

In view of the fact that substantial proportion of crop being mature to over-mature and need for early conversion has fixed a rotation of 75 years. Papita, Didu, White Dhup which are Match wood timber could be worked at a rotation of 30 to 40 years. For calculation of annual cut and yield, a conversion period of 75 years and a rotation of 100 years seems to be justified and has been adopted.

4.4 POTENTIAL ANNUAL CUT & ANNUAL YIELD :

4.4.1 Annual Cut

$$\begin{aligned}
 \text{(i) Area of annual cut} &= \frac{\text{Area to be converted}}{\text{Conversion period}} \\
 &= \frac{65317 \text{ ha.}}{75 \text{ years.}} = 870.89 \text{ ha.} \\
 \text{or} &= 800 \text{ ha.}
 \end{aligned}$$

But it is necessary to have a volume check to avoid over felling and fluctuations in annual yield due to irregular stocking. The static growing stock is preserved as mature or over-mature trees will put on negative increment while younger girth class will put on increment to pass from lower to higher girth classes. Annual yield calculated as follows :-

Annual yield :

$$\begin{aligned}
 \text{(ii) Annual yield} &= V/R \text{ (Modified Von-Mantel's formula)} \\
 \text{(by volume)} & \\
 V &= \text{Volume of growing stock (m}^3\text{)} \\
 R &= \text{Rotation} = 100 \text{ years.} \\
 &= \frac{22600009}{100} = 226000.09 \text{ m}^3.
 \end{aligned}$$

$$\begin{aligned} \text{(iii) Annual yield (by volume)} &= \frac{\text{Volume of trees over exploitable girth}}{25 \text{ (Felling Circle)}} \\ &= \frac{11400299}{25} = 456011.94 \text{ m}^3. \end{aligned}$$

4.4.2 Annual yield as per working model of the A & N Forest and Plantation Development Corporation Limited :

The work schedule of the Andaman and Nicobar Forest & Plantation Development Corporation Limited proposed to raise 75% of the area under Natural Regeneration System and the balance by artificial regeneration system. As such 200 ha. would be clear-felled and 600 ha. naturally regenerated.

(1) Yield from clear felling area - 200 ha.

$$\begin{aligned} \text{Yield} &= 200 \times (268.268 \text{ m}^3/\text{ha.} + 77.737 \text{ m}^3/\text{ha.}) \\ &\quad \text{which is yield of non-commercial trees} \\ &\quad \text{of diameter 10-19 cm.)} \\ &= 200 \times 346.005 \text{ m}^3 \\ &= 69,201.00 \text{ m}^3. \end{aligned}$$

(2) Yield from conversion area - 600 ha.

$$\text{Yield} = 600 \times \text{(i) Volume of tree over exploitable girth - } 174.538 \text{ m}^3/\text{ha.}$$

+ (Plus)

(ii) Volume of trees over 10-19 cm. diameter -  $77.737 \text{ m}^3/\text{ha.}$

$$\begin{aligned} &= 600 \times 252.275 \text{ m}^3 \\ &= 1,51,365.00 \text{ m}^3 \end{aligned}$$

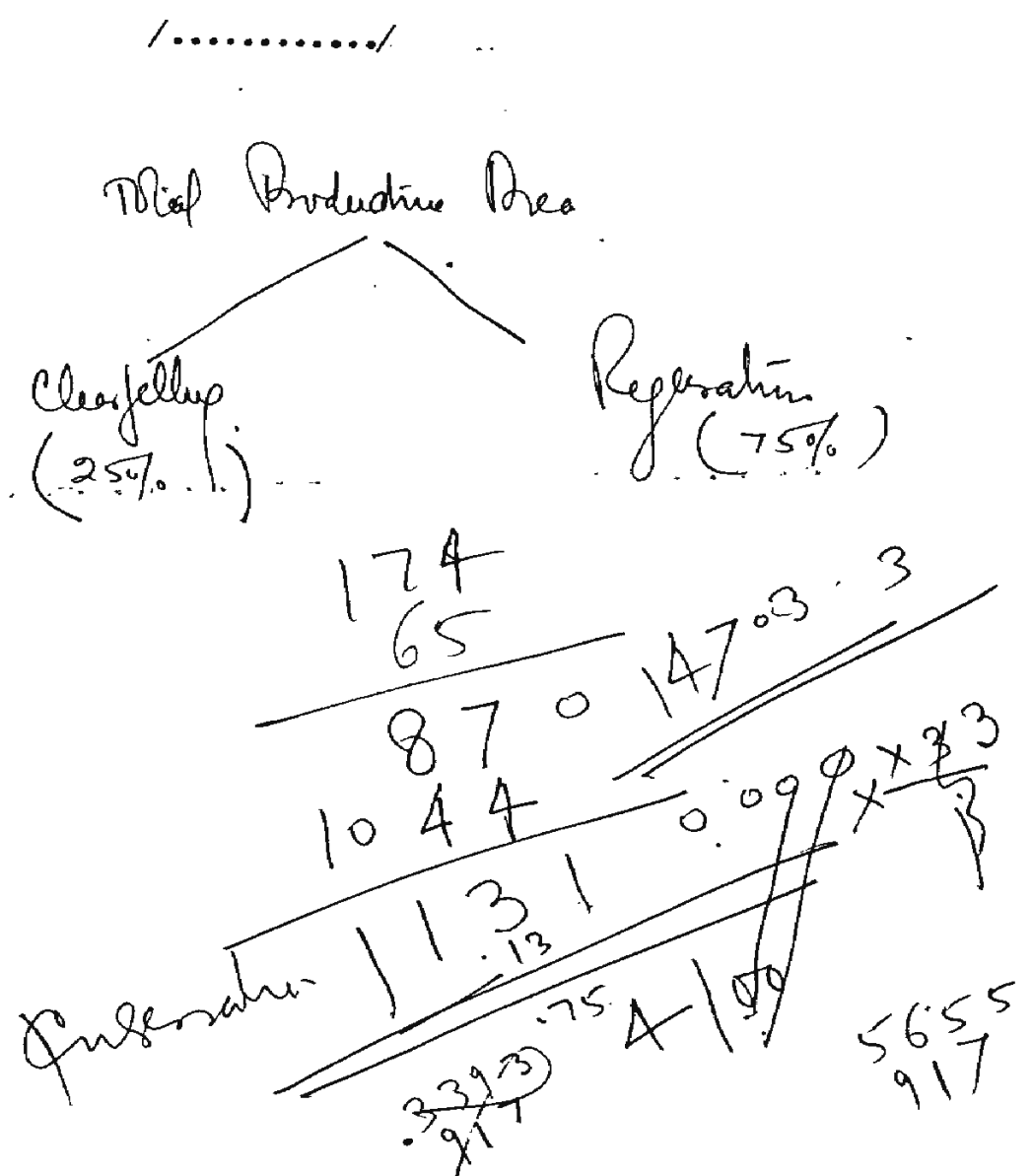
Therefore, total volume available under (1) & (2) & above =  $69,201.00 + 1,57,365.00 = 2,26,566.00 \text{ m}^3$ .

This yield ( $2,26,566.00 \text{ m}^3$ ) is calculated as per Working Model of the Andaman and Nicobar Forest and Plantation Development Corporation and outturn tallies with the findings by using Van-Mantel's modified formula as in para 4.4.1 where yield has been calculated at  $2,26,000.09 \text{ m}^3$ .

The Corporation has not taken into consideration the volume of non-commercial trees of diameter class 10-29 cm. and has assessed a total volume of 2,00,000.00 m<sup>3</sup> (or 800 ha. x 250 m<sup>3</sup>/ha.) from 200 ha. of Clear-felling and 600 ha. of Natural Regeneration areas which reveals that most of the advanced growth which form more than 50% of volume/ha. will be kept intact and heavy felling done to mature and over-mature crop.

In the present report calculations have been based on 800 ha. and with an outturn of 268.268 m<sup>3</sup>/ha. or 2,14,614.40 m<sup>3</sup> for 200 ha. of Clear-felling and 600 ha. of Natural Regeneration areas.

As such the Working Model of the Corporation has been accepted and adopted in yield calculation but with a volume check.



CHAPTER - V  
WOOD BALANCE

5.1 Local Consumption :

It has already been indicated that the population is very small and their requirement, therefore, is meagre. Moreover owing to peculiar situation, there is no likelihood of growth of population at an abnormal rate. Total population is hardly five to six thousand.

The nature of soil will not also permit large scale cultivation for agricultural purposes, as such their need for agricultural implements will also be very small and possibility of fresh rehabilitation is meagre.

It is estimated that in next 10 years, requirement of houses may be to the extent of 6000 to the maximum and therefore,  $6000 \times 1.5 \text{ m}^3$  of wood or  $9000 \text{ m}^3$  of timber will be required besides another  $6000 \times 0.15 \text{ m}^3$  of wood or  $900 \text{ m}^3$  likely to be required for repair of the houses. At present local consumption of Sawn timber is about  $1200 \text{ m}^3$ .

Fire wood requirement per year has been assessed at  $9000 \text{ m}^3$ .

5.2 Commitment to Industries :

At present there is no commitment to any industry. Government Department like Public Works Department, Electricity, Shipping Corporation Establishment, other Government Of India establishments require some timber, but at the moment their demand is small.

5.3 Net Wood Balance :

Net wood balance vis-a-vis rich timber/firewood potential low requirement of the area gives a lucrative wood balance. Almost entire produce from annual cut area would be available for growth of industry at site or in the main Island.

.....

The net wood balance of Little Andaman is as follows :-

	Plywood ✓	Matchwood ✓	Constructi- onal wood ✓	Residual, Small & Non-commer- cial wood or Pulp wood.
1. Annual cut (ha.) AREA	800	800	800	800
2. G.S./ha. (m <sup>3</sup> )	31.174 ✓	38.567	30.157	168.2
3. Annual potential of Residual, Small wood & Non-commercial spp. (15% loss considered) (m <sup>3</sup> )	-	-	-	114398.4
4. Annual potential of commercial species (15% loss considered) (m <sup>3</sup> )	21,198.320 ✓	26,225.560 ✓	20,506.760 ✓	66
5. Adhoc cut on account of unsuitability of non-availability of wood including local consumption (m <sup>3</sup> )	1198.320	1225.560	1506.760	14398.4
6. Available wood balance (m <sup>3</sup> )	20,000.00	25,000.00	19,000.00	1,00,000.00

From the above table it is evident that there are varied resources of wood of different categories and are available in vast quantity. The local consumption is insignificant and therefore the vast surplus has not yet been put to any economic or commercial use.

There is enough scope of proper utilization of the forest resources by creating of different wood based industries which may provide adequate employment opportunities. As the population is very small in the Island and they are already engaged in various employment units. People are to be sent from the mainland to avail such employment opportunities.

16000

8000 = 00

Handwritten calculations and notes:

- 24937200
- 3741
- 21198
- 17517
- 2494
- 1247
- 3741
- 70000
- 16000
- 321500
- 20
- 121
- 147
- 147000
- 496000
- 643000

CHAPTER - VI

ECONOMIC AVAILABILITY AND COST OF RAW  
MATERIAL DELIVERY

6.1 Why Cost Studies :

Harvesting and transport of timber have been serious problems owing to distant location of industries from the mainland and other infrastructural deficiency. The problem of permanent labour and administrative procedures stood in the way of higher production and cost study. Felling, dragging and use of tractors make the extraction difficult and costly. Merchanization involves higher initial investment and the weather condition reduce the working days to minimum. The determination of methods, economical and feasible, for harvesting and the extraction of wood is intimately linked with the harvesting of commercial and other wood by the Forest Department/Corporation on the one hand and Shipping arrangement on the other. All these cannot be synchronized and at the moment only macro-level assessment of cost is possible.

Most problematic operation will be transportation of such logs from Hut Bay (Port) to Port Blair and to the Mainland. Big sized transport carriers may be necessary to transport such timber. As such the entire process of felling, logging, extraction and transportation will involve prohibitive cost and a proper cost study is therefore essential. This factor should be considered before establishment of any industry either at Little Andaman or in Port Blair or in Mainland.

6.2 Objectives :

The broad objective of the study is to find out

- i) the cost involved in the present method of felling, logging and extraction and transportation.
- ii) the present valuation of crop.

6.3 Logging Operation :

The logging operations now in vogue at Little Andamans are old fashioned while the present need dictated modern scientific method of logging. The felling is done by saw and axe. Hand saw and power chain saw have been introduced to some extent. In spite of having introduced hand saw and power chain saws, the use of axe is still going on predominantly. The cross cutting is generally carried by two persons. Local rate of output for felling, logging etc. are :-

Felling with axe (one man)	- 8 m <sup>3</sup> /day.
Felling with power chain saw (two men)	- 20 m <sup>3</sup> /day
Cross cutting with hand saws (two men)	- 10 m <sup>3</sup> /day
Felling with power chain saw (one man)	- Not established.
Cross cutting with power chain saw (one man)	- Not established but it has been estimated that one power chain saw (one man with helper) and one hand saw (two men) together may give a pro- duction of 8,000 m <sup>3</sup> /annum.

Usual methods of haulage of timber in other Island are done by elephant, crawler and wheeled tractors, buffalo carts and cable cranes. The available out put information is as under :-

Elephant	- 4 m <sup>3</sup> per day/km.
Buffalo	- 1 m <sup>3</sup> per day/km.
Crawler tractor	- 40 m <sup>3</sup> per day/km.
Wheeled tractor cable crane.	- Detail not available.

The loading and unloading are done by elephants and also manually. An elephant can load and unload 10 m<sup>3</sup> per hour; while manually (six men) it is 8 m<sup>3</sup> per hours. Use of elephants are being discouraged owing to low work capacity 400/500 to 800 m<sup>3</sup>/annum. Forest to Depot Haulage is generally done by truck and a truck can haul 22 m<sup>3</sup> a day (4 trip a day on 20 km. distance). Debarking has not been mechanised.

In future short distance transport may need winches, crawler or sheeled tractors and cable ways depending on Terrain, Soil, load and size of logs skidding distance etc. Mono Cable system may not at all necessary as the terrain is not hilly or swampy. The Crawler/Skidder tractor for short distance transport and 4 x 4 wheeled drive truck for haulage might be useful. (Skidding distance upto 300 m. by Crawler and 1 km. for Wheeled Tractor).

#### 6.4 Cost of Felling, Logging etc. :

The cost of felling, logging and extraction etc. are as under :-

All operations are done by departmental labour who get high wages and many facilities are extended to them. As per proforma, account of 1975-76 which incorporates the aggregate figure for whole of the department, the cost on various operations are furnished below :-

i) Felling, logging & dragging	- Rs. 190.52 per m <sup>3</sup>	} General } over } head } added
ii) Transport cost of logs from Ghat to Depot and there to delivery Depot.	- Rs. 36.75 "	
<u>T O T A L = Rs. 227.27 m<sup>3</sup></u>		

Transport by Sea from Delivery Depot to Mainland would further cost Rs. 140.00 /m<sup>3</sup>.

Besides, another factor of paramount importance is the price-fixation for the timber. Economic viability of an industry will much depend on the cost of timber.

#### 6.5 Transportation :

During 1975-76, 1976-77 Rs. 23,796=50 was spent by the Forest Department in loading and unloading of timber at Hut Bay and transport to Mainland.

Timber worth 4989=966m<sup>3</sup> was sent to Calcutta. Transportation to Calcutta including loading and unloading cost about Rs. 6,81,012 in two years.

Timber exported to the Railways was 5852=4m<sup>3</sup> during 1975-76 to 1976-77 (June) with an expenditure of Rs. 6,91,590=00 was spent.

Quantity of timber exported to other private parties during the period was 4213=410m<sup>3</sup> and royalty of Rs. 9,10,452=00 was realised; an expenditure of Rs. 44,804=00 was incurred.

Long Distance Transport :- Long distance hauling need different mechanical equipments for skidding and hauling in the forests. Each truck (Tata-1210 S/42) can carry 12 m<sup>3</sup> of timber. Average hauling speed is 30 km./hour and number of trips may be as follows:-

5 (five) trips for a distance of 10 kms., 4 (four) trips for 20 kms., 3 (three) trips for 30 kms., 2 (two) trips for 40 kms. and 2 (two) trips for 50 kms. A truck is capable of transporting 10,000 m<sup>3</sup> annually.

#### 6.6 Shipping and Movement of logs :

Inter Island shipping of wood takes place from Little Andaman to Port Blair for the industries located there. This transport is through small sea going vessels or barges. The Forest Department has been using sea going flat bottomed 200 ft. capacity self-propelled barges. Rafting of timber as done in South and Middle Andaman may not be required in Little Andaman. The use of tractor came into picture in the difficult terrain. Army truck released from the Defence Department could be used but that would not be a wise proposition to work with second hand machine with new vehicles the entire work becomes expensive.

The productivity of Winch Lorry is much lower than the Skidder/Crawler over medium/short haul distances for long haul distances it does not establish its superiority in production and cost with 4-wheel Drive high speed vehicles (being made available within India by Tata).

Short distance transport has to be done with the help of Winches, Crawler tractor, Wheeled tractors & Cable ways depending on terrain, soil, load, log size, skidding distance etc.

The existing method of timber movement is to cut the logs after felling into 3-4 metre lengths. These are then brought to foreshore by trucks or tractor-trailer complex and roll them into log ponds. They are then rafted into lots of 10 to 20 depending on towing vessel and then transported. Towing long distances by launches has not been found suitable. In Little Andaman, extraction is very simple and delivery at Hut Bay is not a problem.

A Jetty exists and the bay will accommodate small ships. The break water recently constructed has a length of 1200 m. With the construction of wharf at about middle of the break water, it will be possible to berth a vessel of a capacity of 5000 m<sup>3</sup>.

In Little Andaman all logs from the felling Zones has been planned to be delivered at Hut Bay by the Forest Corporation.

Ship berthed at Hut Bay should be loaded and unloaded by belt conveyor system; loading and unloading by crane grabs are considered uneconomical. Ship of the type self-discharging bulk carrier is considered most suitable. But there are difficulties in immediate construction such ship; M/S. Bhargava Consultants (P) Ltd. suggest ship of size 7,500 dwt for Little Andaman as the depth of water at Hut Bay does not permit bigger ship.

Suggested Harvesting System :- Mechanization has been considered necessary to cope with large-scale production of wood & pulp wood to ensure its supply within an economic range. The existing system suffer from the defects as follows :- (i) Commercial species being scattered (ii) higher cost of extraction (iii) shortage of labour (iv) transport bottleneck (v) limited local demand (vi) limitation in shipping (vii) deterioration by storage (viii) paucity of fund, but it is possible to overcome these. The harvesting and transport operations/cost are related to yield per acre, topography, soil condition, climatic condition, machinery, labour rate, distance from the port of despatch etc.

#### 6.7 Schedule of Rates :

The selling prices of Andaman timber are fixed after considering the cost of extraction, freight rates and depot charges in vogue etc. and revised from time to time with the approval of Andaman Administration and the Government of India. The Chief Commissioner, Andaman & Nicobar Islands, Port Blair has fixed the following F.O.B. prices for one year for 1978-79 effective from 1.4.1978.

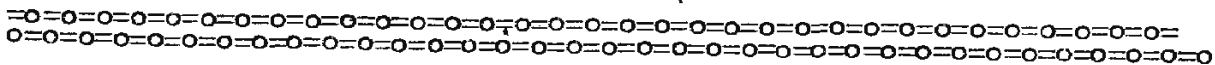
Sl.No.	Species of timber	Rate per m <sup>3</sup> (Rs.)
1	2	3
1	<u>Gurjan Grade - I Logs :</u>	
	(a) 210 cm. and up mid-girth under bark 450 cm. and up in length and 1 m <sup>3</sup> and up in volume.	1,650/-
	(b) 120 cm. and up mid-girth under bark and 300 cm. and up in length.	1,500/-
	<u>Gurjan Grade II Logs :</u>	
	(a) -do-	525/-
	(b) -do-	477/-
	<u>Badam Grade I Logs :</u>	
	(a) -do-	337/-
	(b) -do-	307/-
	<u>Badam Grade II Logs :</u>	
	(a) -do-	253/-
	(b) -do-	230/-
	<u>White Chuglam Grade I Logs :</u>	
	(a) -do-	315/-
	(b) -do-	287/-
	<u>White Chuglam Grade II Logs :</u>	
	(a) -do-	250/-
	(b) -do-	228/-
	<u>Black Chuglam Grade I Logs :</u>	
	(a) -do-	484/-
	(b) -do-	440/-
	<u>Black Chuglam Grade II Logs :</u>	
	(a) -do-	363/-
	(b) -do-	330/-
	<u>Koko, Ponn, Pyimmo, Jhigam, Nabbe and Toungpeinne Logs :</u>	
	(a) -do-	396/-
	(b) -do-	360/-

1	2	3
6.	<u>Lalchini Logs :</u>	
	(a) 210 cm. and up mid-girth under bark 450 cm. and up in length and 1 m <sup>3</sup> and up in volume	250/-
	(b) 120 cm. and up mid-girth under bark and 300 cm. and up in length.	228/-
7	<u>Thingam Logs :</u>	
	(a) -do-	486/-
	(b) -do-	442/-
8	<u>Red Bombwe Logs :</u>	
	(a) -do-	266/-
	(b) -do-	242/-
9	<u>Hill Mohwa Logs :</u>	
	(a) -do-	257/-
	(b) -do-	234/-
10	<u>All Match wood species :</u>	
	(a) 210 cm. and up mid-girth under bark, 450 cm. and up in length, and 1 m <sup>3</sup> and up in volume.	250/-
	(b) 90 cm. and up midgirth under bark and 250 cm. and up in length.	228/-

The Managing Director, Andaman & Nicobar Islands Forest and Plantation Development Corporation Limited, Port Blair has fixed the following F.O.B. ex-Hut Bay/North Andaman Ports for sale of logs w.e.f. 1.11.1978.

Sl.No.	Species of timber	Rate per m <sup>3</sup>
I	<u>PIY LOGS :</u>	
	<u>Gurjan Grade I Logs :</u>	
	210 cm. and up midgirth under bark 450 cm. and up in length and 1 m <sup>3</sup> and up in volume.	Rs. 460/-
	<u>Gurjan Grade II Logs :</u>	
	120 cm. and up mid-girth under bark and 260 cm. and up in length.	Rs. 442/-

Sl.No.	Species timber	(Rate per m <sup>3</sup> )
I	<u>Other Ply Species :</u> Non-Gurjan Ply species above 120 cm. mid-girth under bark irrespective of girth, and length above 260 cm. (Badam, White Chuglam, Lalchini, Nabbe and Red Dhup etc.)	Rs. 275/-
II	<u>Saw logs :</u> Non-Ply Gurjan Grade II Non-Ply Badam Non-Ply White Chuglam Silvery-grey Toungpeinne Black Chuglam Mohwa Poon Thingam Jhingam Red Bombwe Thitpok Other Miscellaneous Hard wood	Rs. 420/- Rs. 270/- Rs. 270/- Rs. 425/- Rs. 360/- Rs. 400/- Rs. 235/- Rs. 360/- Rs. 440/- Rs. 350/- Rs. 240/- Rs. 210/- Rs. 240/-



C H A P T E R - V I I

DEVELOPMENT OF ROADS

7.0 Communication :

Remoteness and difficulties of transport and communication have stood the way of substantial exploitation of forest resources and in the economic development of the Islands. Communications between this Island and Mainland are maintained by a bi-weekly service from Calcutta, Madras and Visagapatnam. In order to transport substantial quantity of timber to mainland more vessels will be necessary. Communications within and between the Islands are very unsatisfactory although efforts are being made to overcome the difficulties.

Transportation of logs from the Andamans to Mainland have posed a problem. Little Cargos come from Mainland to the Andamans. The Forest Department has been dependent on M.V. Shompen (Capacity 2,200 m<sup>3</sup>) for transportation of logs. Recently a vessel M.V. Diglipur with a capacity of 5,000 m<sup>3</sup> has been installed. The Shipping Corporation of India is responsible for the operation of the inter-island transport as well as Island-Mainland routes.

The mainland vessels are comparatively small and as such they take longer time to reach Calcutta/Madras. It takes about 7 days to release a load of 2000 m<sup>3</sup>. A round trip to the mainland takes 16-20 days approximately. Moreover, most of the ports are inadequately equipped.

Satisfactory wireless communication is essential for the proper development of any industry in the Island. All the Government Departments should have a fleet of boats in order to have prompt mobility.

The Indian Airlines operates a bi-weekly Boeing air service between Calcutta and Port Blair. The landing strip is rather unsuitable for Boeing air services.

7.1 Evaluation of ports and infrastructure facilities and over all findings :

Evaluation of important ports on the East Coast of India (Madras, Mashilipatham, Kakinada, Visakhapatnam, Gopalpur, Paradwip and Haldia), their suitability for unloading ships and also for setting up of various plants should form a very important subject of study.

A berth has been planned to be constructed within 2/3 years inside the break-water at an estimated cost of 0.4 million. This berth will have 7 m. depth of water and will accommodate bigger ships.

7.2 Planning for new roads :

To remove the remoteness and difficulties of transport and communications and to ensure proper and prompt mobility within the Island it has been planned to construct the following roads within a very short time.

<u>From</u>	<u>To</u>	<u>Km.</u>
Hut Bay	South Creek	39 km.
Hut Bay	Dugang Creek	26 km.
Hut Bay	Jackson Creek	72 km.
South Creek	Jackson Creek	42 km.
Jackson Creek	Dugang Creek	37 km.

7.3 Roads existing in the area :

The road communication within the Island is still now unsatisfactory. The estimated total requirement of road in Little Andaman is about 46 km. as assumed by the Andaman and Nicobar Islands Forest & Plantation Development Corporation Limited. But only 22 km. has been developed in Little Andaman so far. There is another 2 km. approach road to the quarry from Hut Bay. There is a temporary fair weather road about 13 km. length from Hut Bay to the Light House point at South Bay. Of this first 5 km. has been opened by the A.H.W. to connect the Nicobary village with Hut Bay. On this stretch all the culverts have been built though road work itself has not yet been taken up. The remaining 8 km. is maintained by the Light House and Light Ship Department for transporting their stores etc. to the Light House sites. This stretch is purely temporary. All these roads run more or less along the sea-shore.

It has been planned that further road will be constructed when the exploitation work will be started in new areas and it is proposed that feeder roads will be constructed in Little Andaman within a very short time.

Estimate of formation and maintenance costs :

The estimated cost of construction of roads in Little Andaman is :-

- i) Service Roads Rs. 4.00 lakhs per km.
- ii) Feeder Road Rs. 1.50 lakhs per km.

Cost assumption for maintenance of roads in Little Andaman is :-

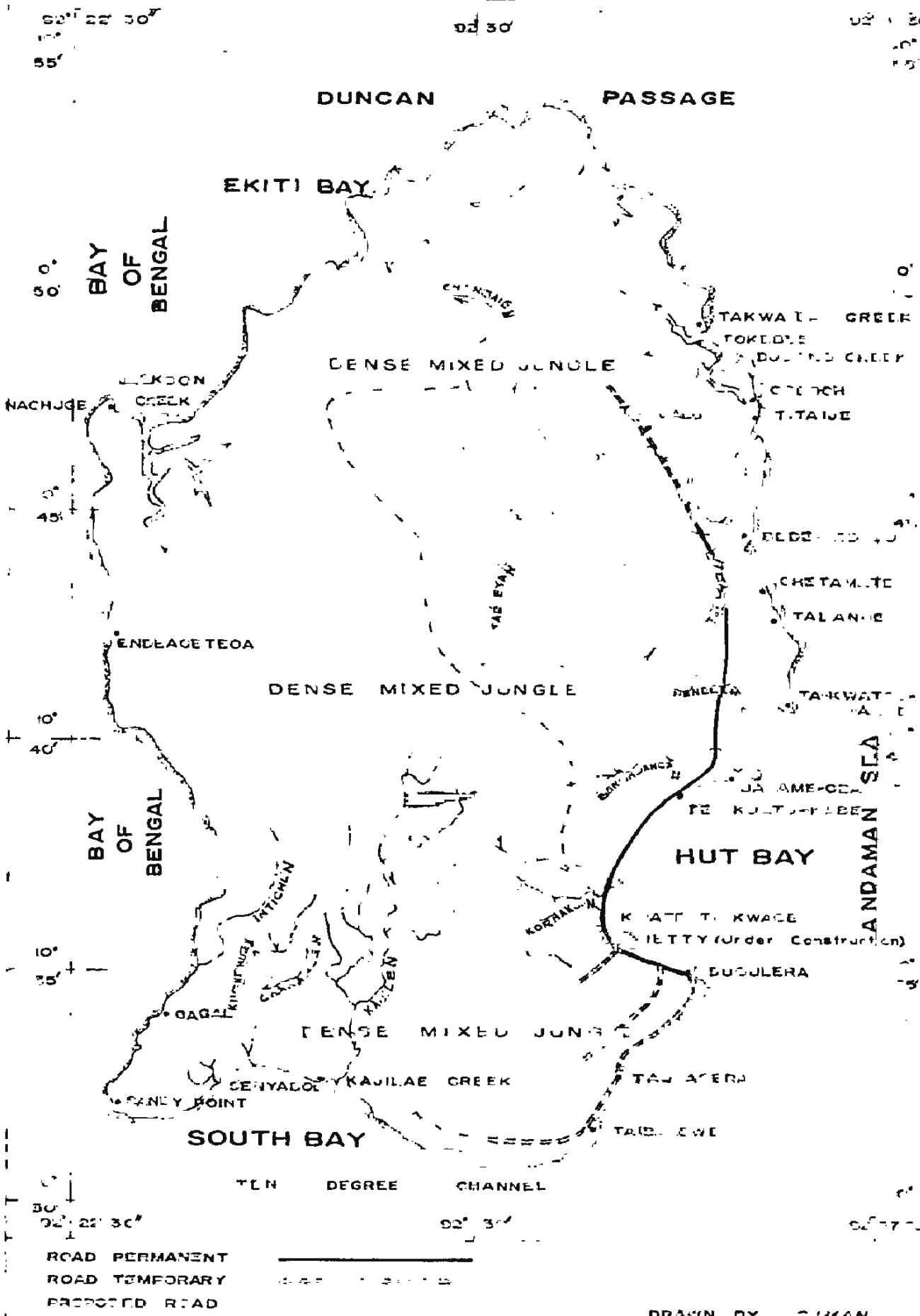
- i) Service Road Rs. 4000/- per km.
- ii) Feeder Road Rs. 2000/- per km.

For extraction throughout the year it may be necessary to construct black top road.

# LITTLE ANDAMAN

MAP SHOWING THE ROAD

SCALE - 1:2,00,000



ROAD PERMANENT  
ROAD TEMPORARY  
PROPOSED ROAD

DRAWN BY [Name]

C H A P T E R - V I I I

SCOPE OF FOREST BASED INDUSTRIAL DEVELOPMENT ASSESSMENT OF INVESTMENT & REQUIREMENTS BENEFIT & DEVELOPMENT OPPORTUNITIES.

8.1 Industrial Investigations and Possibilities :

Investigation made in past.

In 1972 National Industrial Development Corporation Ltd. carried out a feasibility study for entire Andaman & Nicobar Islands with respect to following industries :-

- i) Plywood and Saw Mill complex.
- ii) Export potential for round wood, Sawn timber and wood chips.
- iii) Chip production - a pilot study.

The Feasibility study recommended a wood-based complex for processing 10000 m<sup>3</sup>(r) timber per year by a Saw Mill and 5000 m<sup>3</sup> wood/year by a Plywood Mill.

Industrial potential .

The Survey results of forest resources and existing market demand have shown that the following quantity of wood for different and products may be surplus for future wood-based industries :-

<u>Type of wood</u>	<u>Quantity (m<sup>3</sup>)</u>
i) Ply logs	20,000
ii) Match wood	25,000
iii) Constructional timber	19,000
iv) Pulp wood	1,00,000

A list of wood based units in whole Andaman and Nicobar Islands have been seen under para 1.19. There is a small Departmental Saw Mill in Little Andaman which is mainly catering the needs of harbour works.

Infrastructural facilities..

In Little Andaman there is only 22 km. all weather road which runs from Hut Bay to Vivekanandpuram village. There is a 13 km. long fair weather road running from Hut Bay to the Light House points at South Bay.

Both the roads run along the sea shore. No road leads to inner part of the Island.

Availability of Electric power and water.

There is a small diesel generator at Hut Bay catering to the needs of Andaman-Hydro-electrics but there is a proposal to increase the production of electricity.

There is scarcity of fresh water in the Island. However, for small scale wood-based units the existing water may be sufficient.

Availability of labour.

The population of the whole Island is about 6 lakhs and the literacy is about 44%. Nearly 40% of the total population is workers. The problem of labour is acute in the region.

Industrial possibilities.

According to prevailing circumstances the possibility of new wood-based industries is remote. However, there is possibility of expanding the capacity of the existing industries.

The following existing industries can be expanded on the basis of surplus wood available in Little Andaman Island.

- i) Match Industry :- At present there is a match splint factory at Port Blair. The installed capacity of the mill is 10,000 m<sup>3</sup>. The capacity of this mill can be doubled to 20,000 m<sup>3</sup>. Thus will produce about 20,000 x 0.6 million match splints ( 1 m<sup>3</sup> = 0.6 million splints) i.e. 12,399 million match boxes or 1.7 million grosses of safety matches.
- ii) Plywood Industry :- There are two plywood industries in Andaman Islands. The total intake of wood by these units is about 19930 m<sup>3</sup>/year. The available wood for this purpose from Little Andaman is about 20,000 m<sup>3</sup> which is sufficient to expand the capacities of the existing mills.
- iii) Saw Milling Industry :- There are 10 Saw Mills in the Whole Andaman and Nicobar Islands. The total installed capacity of the mills is about 101,500 m<sup>3</sup>/year. The average annual intake of wood by these mills is 364,800 m<sup>3</sup>. On the basis of existing wood balance for constructional timber the capacity of the existing saw mills can be proportionately increased.
- iv) Charcoal Industry/Pulp & Paper Industry :- The possibility of setting up pulp and paper unit in Andaman and Nicobar Island is remote due to non-availability of pre-requisites for pulp and paper industry. Hence, it is suggested that the quantity of surplus pulp wood which is around 100,000 m<sup>3</sup> may be diverted for manufacturing activated wood charcoal. A detailed feasibility study for setting a wood-charcoal industry should be carried out.

CHAPTER - IX  
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. (i)

Utility class & division-wise volume (m<sup>3</sup>) per hectare.

Utility class	D I V I S I O N S					
	Little Andaman			N. Andaman	M. Andaman	S. Andaman
	Littor- al	Decid- duous	Everg- reen	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	<b>11.683</b>	8.874	16.279
Constructio- nal 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 Padak 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<sup>3</sup>)

Divisions	Stratum	Plywood volume.	Matchwood volume.	Constructional wood vol.	Ornamental wood volume.	Non-commercial wood volume.	Residual wood volume.	Small wood volume.
Little Andaman	Littoral	18,739	31,815	133,901	-	104,872	89,523	20,598
	Deciduous	227,830	210,195	143,467	-	481,158	437,381	110,630
	Evergreen	1789,572	2277,053	1693,334	-	4484,377	4195,557	1064,339
North Andaman	Tropical rain forest.	3312,686	1846,031	2648,144	2886,181	4545,027	10347,959	8190,206
	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.

STATEMENT NO. 3

3 ✓

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

Divisions	Diameter Classes (in cm.)									Total	
	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99		100+
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

- (i) While diameter class was measured down to 10-19 cm. in the three main Andaman Divisions, it was only upto 20 cm. in case of Little Andaman.
- (ii) Total volume per hectare remain 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 (10 - 19 cm.) class has not been added to it.
- (iii) Little Andaman has got too many matured trees and less of young regeneration.
- (iv) 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 class.

/diameter

STATEMENT NO. 4

DIVISION-WISE DIAMETER CLASS & TOTAL VOLUME (IN '000 M<sup>3</sup>) (EXCEPT MANGROVE SPECIES)

Divisions	Diameter Classes (in cm.)										TOTAL
	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	
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	2370.637	1773.783	1781.700	1162.735	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.

STATEMENT 5

SPECIES WISE TOTAL VOLUME ( M<sup>3</sup> ) 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.			
	10-29 +	30-59	60-100 +	Total	10-29 +	30-59	Total	60-100 +
1. Dipterocarpus species.	4.691	6.065	10.756	12.135	2.130	4.494	6.624	10.816
2. Perishia insignis.	0.536	1.248	1.784	1.061	0.619	2.359	2.978	1.762
3. Terminalia bialata.	0.323	1.486	1.809	2.844	0.188	0.680	0.868	2.032
4. Terminalia procera.	0.959	3.940	4.899	3.408	0.627	2.737	3.364	1.720
5. Salmalia insignis.	0.209	0.936	1.145	0.635	0.159	0.814	0.973	0.830
6. Artocarpus chaplasha.	1.605	3.322	4.927	2.614	0.652	2.345	2.997	1.203
7. Lagerstroemia hypeleuca.	0.542	0.833	1.375	1.581	0.787	1.738	2.525	5.474
8. Pterocarpus dalbergioides.	0.748	2.480	3.228	21.107	0.798	3.087	3.885	37.314
9. Other species.	56.712	51.122	107.834	30.742	48.399	50.829	99.228	35.300
<b>TOTAL</b>	<b>66.325</b>	<b>71.432</b>	<b>137.757</b>	<b>75.127</b>	<b>54.359</b>	<b>69.083</b>	<b>123.442</b>	<b>96.451</b>

Contd. 61. (a)

(i) Dipterocarpus species: . . .

Regeneration seems to be meagre in Little Andaman (10-19 cm. trees not calculated). South Andaman has got profuse regeneration of the three main divisions, while Middle Andaman has got the least.

South Andaman also has maximum number of middle aged poles in the diameter class 30-59 cm. South Andaman also scores the highest of the three Andaman divisions in the volume of under matured trees (Little Andaman Flora has got the maximum of all the four Divisions).

(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.

61 (a)

SOUTH ANDAMAN		LITTLE ANDAMAN					
10-29	30-59	Total	60-100 +	20-29	30-59	Total	60-100 +
8.032	13.913	21.945	15.454	0.713	3.560	4.273	19.758
1.489	4.768	6.257	2.741	0.040	0.469	0.509	3.164
0.150	0.771	0.921	1.173	0.032	0.847	0.879	4.787
1.072	3.595	4.667	3.360	0.120	1.525	1.645	6.282
0.196	0.540	0.736	2.226	0.081	0.594	0.675	12.103
1.221	4.358	5.579	1.017	0.553	2.478	1.031	16.174
1.081	1.819	2.270	1.461	0.008	0.194	0.202	3.025
0.593	3.600	4.193	16.207	-	-	-	-
45.633	55.647	101.280	55.600	22.986	71.485	94.471	97.220
59.467	89.011	148.478	79.239	24.533	81.152	105.685	162.513

S T A T E M E N T - 0

SPECIES WISE TOTAL VOLUME ( in 000 M<sup>3</sup> ) ABOVE EXPLOITABLE DIAMETER CLASSES ( 60 to 100 + )  
AND BELOW ( 10 cm to 59 cm )

ANDAMAN

Name of Species	NORTH ANDAMAN		MIDDLE ANDAMAN			
	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
Parishia insignis	85.240	198.115	168.607	38.959	148.471	110.896
Terminalia bialata.	51.227	235.647	451.333	11.831	42.797	127.890
Terminalia procera.	152.224	624.836	382.161	29.462	194.921	149.415
Salmalia insignis.	33.196	148.552	101.159	10.006	51.231	52.239
Atrocarpus chaplasha.	247.509	526.771	414.763	41.038	147.590	75.714
Agastroemia hypoleuca.	86.199	132.328	308.898	49.532	109.387	344.524
Pterocarpus dalbergioides.	118.839	393.363	3346.269	50.288	194.354	2348.376
Others species.	9000.538	8112.834	4354.699	3056.134	3176.476	2180.307
<b>TOTAL</b>	<b>10523.151</b>	<b>11334.192</b>	<b>11919.090</b>	<b>3421.309</b>	<b>4348.073</b>	<b>6070.467</b>

Contd 63 (a)

STATEMENT # 7

DIVISION WISE STEMS PER HECTARE BY DIAMETER CLASSES ( CM )

ANDAMAN

DIVISIONS	D I A M E T E R C L A S S E S ( in cm )										Total
	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	
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	1.931	0.931	1.706	390.121
NORTH ANDAMAN	218.362	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.

①

⑤

63 (a)

SOUTH ANDAMAN		LITTLE ANDAMAN			
10-29	30-59	60-100 +	20-29	30-59	60-100 +
493,006	853,993	946,588	46,542	232,546	1290,528
91,401	292,665	168,243	2,586	30,628	206,628
9,246	47,320	71,985	2,099	55,289	312,668
65,793	220,650	206,276	7,807	99,623	410,306
12,010	33,133	136,667	5,271	38,803	790,525
74,955	224,591	62,421	36,147	161,844	1056,415
66,352	72,979	89,666	0,493	12,646	197,568
36,410	220,970	994,790	-	-	-
2801,000	3497,270	2185,151	1501,369	4669,174	6350,140
3650,173	5463,572	4863,787	1602,314	5300,553	10614,778

64

S T A T E M E N T - 8

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

	D	I	A	M	E	T	E	R.	C	L	A	S	E	S	( 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	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	196.014	118.508	57.137	104.755	23946.024				
NORTH															
ANDAMAN	34714.244	11095.076	4796.632	2485.474	1363.430	713.003	391.139	306.208	163.161	333.032	56359.399				
LITTLE															
ANDAMAN	-	3146.843	1816.697	1300.583	851.013	630.517	385.455	256.263	84.124	267.651	8739.281				

\* 114 2 122.29

(2)

SPECIES WISE CLASSIFICATION OF STEMS PER HECTARE ABOVE EXPLOITABLE DIAMETER CLASSES

( 30 to 100 cm. and below and below ( 10cm to 59cm )

NAME OF THE SPECIES	MIDDLE ANDAMAN			
	10-29	30-59	60-100	Total
1. Dipterocarpus species.	1.969	3.905	14.874	19.748
2. Parishia insignis.	2.129	0.971	3.100	6.200
3. Terminalia bialata.	0.845	0.929	1.774	3.548
4. Terminalia procera.	3.200	2.650	5.850	11.700
5. Salmalia insignis.	0.732	0.746	1.478	3.056
6. Artocarpus chaplasha.	4.581	2.846	7.427	14.854
7. Lagerstroemia hypoleuca.	2.241	0.549	2.790	5.580
8. Pterocarpus dalbergioides.	2.439	1.635	4.074	8.148
9. Other Species.	261.779	40.251	302.030	564.060
<b>TOTAL</b>	<b>288.915</b>	<b>54.482</b>	<b>343.597</b>	<b>686.994</b>

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.

Con'd 66 (a)

66 (a)

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
0.503	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
300.595	67.322	375.917	14.204	48.178	60.754	108.932	24.864

Stems per hectare by specieswise and diameter classwise

Stratum - Evergreen

Table No. 1.1

PLYWOOD SPECIES

Species Code.	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	10C +	Total
1	1.235	0.877	0.841	0.536	0.465	0.536	0.501	0.089	0.769	5.849
2	0.107	0.089	0.053	0.089	0.053	0.017	0.035	0.017	0.017	0.460
3	0.071	0.107	0.161	0.071	0.125	0.107	0.053	0.053	0.071	0.819
4	0.071	0.107	0.125	0.125	0.161	0.089	0.143	0.035	0.089	0.945
5	0.250	0.250	0.340	0.286	0.429	0.250	0.196	0.161	0.161	2.162
Total	1.734	1.430	1.520	1.107	1.233	0.999	0.928	0.177	1.107	10.235

*Conarus*

*Thu*

Table No. 1.2

MATCHWOOD SPECIES

6	0.089	0.071	0.035	0.107	0.071	0.125	0.143	0.107	0.161	0.909
7	0.017	-	0.035	0.035	0.017	-	-	-	-	0.104
8	0.196	0.178	0.178	0.107	0.107	0.055	0.035	-	-	0.854
9	0.196	0.089	0.196	0.107	0.107	0.178	0.214	0.089	0.698	1.874
10	2.130	1.324	1.414	1.002	0.608	0.322	0.053	0.017	0.107	6.977
11	1.038	0.715	0.733	0.608	0.644	0.590	0.411	0.071	0.143	4.953
Total	3.666	2.377	2.591	1.966	1.554	1.268	0.856	0.284	1.109	15.671

*Conarus*

*Endosp. moli*

*Alto apha*

*Salmella*

*Sideroxylon*

*Platycybus*



Table No. 1.5

*Emery*

NON-COMMERCIAL WOOD SPECIES

Species Code	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100+	Total
31	5.306	2.738	1.610	0.733	0.214	0.142	0.071	-	0.017	11.432
38	0.017	-	0.017	-	0.017	0.017	-	-	0.017	0.085
34	-	0.017	-	0.017	0.017	0.017	-	-	0.017	0.103
35	-	-	-	-	-	-	-	-	0.017	0.017 <i>Emodia</i>
37	0.035	0.053	0.035	0.017	0.035	0.017	-	0.035	0.017	0.244
38	0.107	0.035	0.053	-	-	-	0.035	0.017	0.161	0.443
42	0.340	0.178	0.107	0.053	0.053	-	-	-	-	0.731
43	0.035	0.017	0.017	0.053	0.017	-	-	-	-	0.139
44	0.017	-	0.071	0.125	0.017	-	0.017	-	-	0.247
45	1.664	1.431	1.664	1.951	1.288	0.572	0.286	0.071	0.089	9.016
46	0.125	0.053	-	0.017	-	-	-	0.017	-	0.212
47	0.196	0.161	0.178	0.071	0.017	-	-	-	-	0.623
48	0.053	0.035	0.035	0.035	-	0.017	-	0.017	0.143	0.353
49	0.017	-	0.035	-	-	0.017	0.017	-	-	0.086
50	0.143	0.268	0.107	0.178	0.089	-	0.017	0.017	-	0.836
51	0.483	0.178	0.161	0.035	0.017	-	-	-	-	0.874
52	1.199	0.715	0.698	0.286	0.196	0.053	-	-	-	3.147
55	0.035	0.017	0.071	0.071	0.053	0.017	0.035	0.035	-	0.334
56	-	0.053	0.017	0.035	-	-	-	-	-	0.105
58	29.642	15.734	9.164	4.779	3.221	1.664	0.894	0.322	0.590	66.010

<b>Total</b>	40.014	21.683	14.040	8,474	5,251	2,587	1,372	0,531	1,085	95.037
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*Emodia*

*Emodia*

*Emodia*

Stems per hectare by specieswise and diameter classwise

Stratum : Littoral

Table No. 1.6

PLYWOOD SPECIES

Species Code	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100+	Total
2	-	-	0.113	0.113	-	-	-	0.226	0.113	0.565
4	0.113	0.340	0.113	0.340	0.113	0.113	-	-	0.226	1.358
5	0.453	0.113	-	-	0.226	0.113	-	-	0.226	1.131
Total	0.566	0.453	0.226	0.453	0.339	0.226	-	0.226	0.565	3.054

Table No. 1.7

MATCHWOOD SPECIES

7	-	-	-	0.113	-	-	-	-	-	0.113
8	0.113	-	-	-	-	-	-	-	-	0.113
9	0.113	-	-	0.113	-	-	-	-	0.680	0.906
10	0.453	1.360	1.020	0.507	0.453	0.340	-	-	-	4.533
11	1.134	0.793	0.453	0.340	0.340	0.226	0.453	0.453	0.113	4.305
Total	1.813	2.153	1.473	1.473	0.793	0.566	0.453	0.453	0.793	9.970



Table No. 1.10

Non-commercial Wood Species

Species Code	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total
31	1.814	1.700	0.567	0.112	-	-	0.226	-	-	4.419
33	-	-	-	-	0.113	-	-	-	-	0.113
37	-	-	0.113	0.226	0.113	0.113	0.113	-	-	0.678
38	-	-	-	0.113	0.113	-	-	-	0.113	0.339
39	-	-	-	-	-	-	-	-	0.113	0.113
42	0.340	0.226	0.223	-	-	-	-	-	-	0.792
44	0.340	-	-	-	-	-	-	-	-	0.340
45	0.226	0.226	0.113	0.226	0.226	0.113	0.340	0.226	0.113	1.809
47	1.474	0.340	-	0.453	0.226	0.113	-	-	-	2.606
48	-	0.113	-	0.113	-	-	0.113	-	0.113	0.452
50	-	-	-	-	-	0.113	-	-	-	0.113
51	-	0.113	-	0.113	-	-	-	-	-	0.226
58	20.525	10.092	5.670	3.742	3.061	2.721	2.041	3.340	0.907	52.099
<b>Total</b>	<b>24.719</b>	<b>12.810</b>	<b>6.689</b>	<b>5.098</b>	<b>3.852</b>	<b>3.173</b>	<b>2.833</b>	<b>3.566</b>	<b>1.359</b>	<b>64.099</b>

*Li. Howard*

Stems per hectare specieswise and diameter classwise

Stratum : Deciduous

Table No. 1.11

PLYWOOD SPECIES

Species Code	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total
1	1.587	1.700	0.907	0.680	1.927	0.226	0.907	0.340	0.907	9.181
3	0.113	-	0.113	0.113	0.226	0.113	0.226	-	0.113	1.017
4	0.113	-	0.113	0.453	0.226	0.226	0.113	-	-	1.244
5	0.537	0.226	0.340	-	0.453	0.226	0.226	-	0.126	2.164
<b>Total</b>	<b>2.380</b>	<b>1.926</b>	<b>1.473</b>	<b>1.246</b>	<b>2.832</b>	<b>0.791</b>	<b>1.472</b>	<b>0.340</b>	<b>1.146</b>	<b>13.606</b>

Table No. 1.12

MATCH WOOD SPECIES

6	0.113	-	0.113	0.113	0.226	0.113	0.113	0.113	0.340	1.244
7	-	-	-	-	-	0.113	-	-	-	0.113
8	1.360	0.226	0.580	0.113	0.226	0.113	-	0.113	-	2.831
9	0.907	0.113	0.113	-	0.340	0.113	0.226	0.226	0.340	2.378
10	1.700	0.907	1.247	1.247	0.567	0.453	-	-	-	6.121
11	0.680	0.567	0.680	0.453	0.453	0.340	0.226	-	0.340	3.739
<b>Total</b>	<b>4.760</b>	<b>1.813</b>	<b>2.833</b>	<b>1.926</b>	<b>1.812</b>	<b>1.245</b>	<b>0.565</b>	<b>0.452</b>	<b>1.020</b>	<b>16.426</b>



Table No. 1.15

*Deciduous*

NON-COMMERCIAL WOOD SPECIES

Species Code	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total
31	5.670	2.041	0.567	-	0.113	-	-	-	-	8.391
34	-	0.113	-	-	-	0.113	-	-	-	0.226
37	0.113	0.113	-	-	-	-	-	-	-	0.226
38	-	0.113	0.113	-	-	-	-	-	0.540	0.566
39	-	0.113	-	-	-	-	-	-	-	0.113
42	0.793	-	0.226	0.113	-	-	-	-	-	1.132
44	-	-	-	0.113	0.113	-	0.113	-	-	0.339
45	1.587	1.020	2.041	1.587	1.700	0.567	0.453	-	-	8.955
47	0.226	-	-	-	-	-	-	-	-	0.226
48	0.113	-	-	-	-	0.113	0.113	-	-	0.339
50	0.340	0.567	0.453	0.453	0.113	-	-	-	-	1.926
51	1.134	0.453	0.340	-	-	-	-	-	-	1.927
52	1.474	0.793	0.567	0.340	0.226	0.226	-	-	-	3.626
55	-	0.226	-	-	-	-	-	-	-	0.226
56	0.113	-	-	-	-	-	-	-	-	0.113
58	28.690	16.556	8.391	5.670	3.742	3.515	1.134	0.340	0.246	68.264
<b>Total</b>	<b>40.253</b>	<b>22.108</b>	<b>12.698</b>	<b>8.276</b>	<b>6.007</b>	<b>4.534</b>	<b>1.813</b>	<b>0.340</b>	<b>0.516</b>	<b>96.595</b>

Total Stems (.000 units) Specieswise and diameter classwise

Stratum : Evergreen

Table No. 2.1

PLYWOOD SPECIES

Species Code	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total
1	71.985	51.118	49.070	31.242	27.103	31.243	29.202	5.187	44.823	340.922
2	6.236	5.187	3.089	5.187	3.089	0.990	2.040	-	0.990	26.808
3	4.138	6.236	9.384	4.138	7.286	6.236	3.089	3.089	4.138	47.734
4	4.138	6.236	7.286	7.286	9.384	5.187	8.335	2.040	5.187	55.079
5	14.572	14.572	19.817	16.670	25.005	14.572	11.424	-	9.384	126.016
<b>Total</b>	<b>101.069</b>	<b>83.349</b>	<b>88.596</b>	<b>64.523</b>	<b>71.867</b>	<b>58.227</b>	<b>54.090</b>	<b>10.316</b>	<b>64.522</b>	<b>596.559</b>

Table No. 2.2

MATCHWOOD SPECIES

6	5.187	4.138	2.040	6.236	4.138	7.286	8.335	6.236	9.384	52.980
7	0.990	-	2.040	2.040	0.990	-	-	-	-	6.060
8	11.424	10.375	10.075	6.236	6.236	3.089	2.040	-	-	49.475
9	11.424	5.187	11.424	6.236	6.236	10.375	12.475	5.187	40.685	109.227
10	124.153	77.173	82.418	58.404	35.439	18.768	3.089	0.990	6.236	406.671
11	60.502	41.675	42.725	35.439	37.537	34.389	23.356	4.138	8.335	288.696
<b>Total</b>	<b>213.680</b>	<b>138.548</b>	<b>150.723</b>	<b>114.591</b>	<b>90.576</b>	<b>73.907</b>	<b>49.893</b>	<b>16.551</b>	<b>64.640</b>	<b>913.109</b>



Table No. 2.5

NON-COMMERCIAL WOOD SPECIES

Species Code	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100+	Total
31	344,248	159,592	93,843	42,725	12,473	8,835	4,138	-	0.990	666,344
33	0.990	-	0.990	-	0.990	0.990	-	-	0.990	4,950
34	-	0.990	-	0.990	0.990	2.040	-	-	0.990	6,000
35	-	-	-	-	-	-	-	-	0.990	0,990
36	2,040	3,089	2,040	0.990	2,040	0.990	-	2,040	0.990	14,219
37	6,236	2,040	3,089	-	-	2,040	2,040	0.990	9,384	25,819
42	19,817	10,375	6,236	3,089	3,089	-	-	-	-	42,606
43	2,040	0.990	0.990	3,089	0.990	-	-	-	-	8,099
44	0.990	-	4,138	7,286	0.990	-	0.990	-	-	14,394
45	96,991	86,410	96,991	113,719	75,074	33,340	16,670	4,138	5,187	525,520
46	7,286	3,089	-	0.990	-	-	-	0.990	-	12,355
47	11,424	9,384	10,375	4,138	0.990	-	-	-	-	36,311
48	3,089	2,040	2,040	3,089	-	0.990	-	0.990	8,335	20,573
49	0.990	-	0.990	-	-	0.990	0.990	-	-	5,010
50	8,335	15,621	6,236	10,375	5,187	-	0.990	0.990	0.990	48,724
51	28,153	10,375	9,384	2,040	0.990	-	-	-	-	50,942
52	69,887	41,675	40,685	16,670	11,424	3,089	-	-	-	183,130
55	2,040	0.990	4,138	4,138	3,089	0.990	2,040	2,040	-	19,465
56	-	3,089	0.990	2,040	-	-	-	-	-	6,119
58	1727,772	917,103	534,151	278,558	187,745	96,991	52,109	18,768	34,389	3847,586
<b>Total</b>	<b>2332,528</b>	<b>1263,852</b>	<b>818,356</b>	<b>493,526</b>	<b>306,061</b>	<b>150,785</b>	<b>79,967</b>	<b>30,946</b>	<b>63,235</b>	<b>5339,456</b>

Total Stems specieswise and diameter classwise (in '000 units)

Stratum : Littoral

Table No. 2.6

PLYWOOD SPECIES

Species Code.	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total
2	-	-	0.150	0.150	-	-	-	0.301	0.150	0.751
4	0.750	0.454	0.150	0.754	0.150	0.150	-	-	0.301	2.409
5	0.605	0.150	-	-	0.301	0.150	-	-	0.301	1.507
<b>Total</b>	<b>1.355</b>	<b>0.604</b>	<b>0.300</b>	<b>0.604</b>	<b>0.451</b>	<b>0.300</b>	<b>-</b>	<b>0.301</b>	<b>0.752</b>	<b>4.667</b>

Table No. 2.7

MATCHWOOD SPECIES

7	-	-	-	0.150	-	-	-	-	-	0.150
8	0.150	-	-	-	-	-	-	-	-	0.150
9	0.150	-	-	0.150	0.150	-	-	-	0.908	1.358
10	0.605	1.816	1.362	1.211	0.605	0.454	-	-	-	6.035
11	1.515	1.059	0.605	0.454	0.454	0.301	0.605	0.605	0.150	5.748
<b>Total</b>	<b>2.420</b>	<b>2.875</b>	<b>1.967</b>	<b>1.965</b>	<b>1.209</b>	<b>0.755</b>	<b>0.605</b>	<b>0.605</b>	<b>1.058</b>	<b>13.459</b>



Table No. 2.10

NON-COMMERCIAL WOOD SPECIES

Species Code	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total
31	2.423	2.271	0.757	0.150	-	-	0.301	-	-	5.902
33	-	-	-	-	0.150	-	-	-	-	0.150
37	-	-	0.150	0.301	0.150	0.150	0.150	-	-	0.901
38	-	-	-	0.150	0.150	-	-	-	0.150	0.450
42	0.454	0.301	0.301	-	-	-	-	-	-	1.056
44	0.454	-	-	-	-	-	-	-	-	0.454
45	0.301	0.301	0.150	0.301	0.301	0.150	0.454	0.301	0.150	2.409
46	-	-	-	-	-	-	-	-	0.150	0.150
47	1.969	0.454	-	0.605	0.301	0.150	-	-	-	3.479
48	-	0.150	-	0.150	-	-	0.150	-	-	0.600
50	-	-	-	-	-	0.150	-	-	-	0.150
51	-	0.150	-	0.150	-	-	-	-	-	0.300
58	27.421	13.482	7.575	4.999	4.089	3.635	2.726	0.454	1.211	65.592
<b>Total</b>	<b>33.022</b>	<b>17.109</b>	<b>8.933</b>	<b>6.806</b>	<b>5.141</b>	<b>4.235</b>	<b>3.781</b>	<b>0.755</b>	<b>1.811</b>	<b>81.593</b>

*W. H. Jones*

Total Stems by specieswise and diameter classwise(,000 units)

Stratum : Deciduous

Table No. 2.11

PLYWOOD SPECIES

Species Code.	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total
1	9.034	9.678	5.163	3.871	10.970	1.286	5.163	1.935	5.163	52.263
3	0.643	-	0.643	0.643	1.286	0.643	1.286	-	0.643	5.787
4	0.643	-	0.643	2.578	1.286	1.286	0.643	-	-	7.079
5	3.227	1.286	1.935	-	2.578	1.286	1.286	-	1.286	12.884
<b>Total</b>	<b>13.547</b>	<b>10.964</b>	<b>8.384</b>	<b>7.092</b>	<b>16.120</b>	<b>4.501</b>	<b>8.378</b>	<b>1.935</b>	<b>7.092</b>	<b>78.013</b>

Table No. 2.12

MATCHWOOD SPECIES

6	0.643	-	0.343	0.643	1.286	0.643	0.643	0.643	1.935	7.079
7	-	-	-	-	-	0.643	-	-	-	0.643
8	7.742	1.286	3.871	0.643	1.286	0.643	-	0.643	-	16.114
9	5.163	0.643	0.643	-	1.935	0.643	1.286	1.286	1.935	13.534
10	9.678	1.935	7.099	7.099	3.227	2.578	-	-	-	31.616
11	3.871	3.227	3.871	2.578	2.578	1.935	1.286	-	1.935	21.281
<b>Total</b>	<b>27.097</b>	<b>7.091</b>	<b>16.127</b>	<b>10.963</b>	<b>10.312</b>	<b>7.085</b>	<b>3.215</b>	<b>2.572</b>	<b>5.805</b>	<b>90.267</b>



Table No. 2.15

NON-COMMERCIAL WOOD SPECIES

Species Code	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total
31	32,279	11,619	3,227	-	0,643	-	-	-	-	47,768
34	-	0,643	-	-	-	0,643	-	-	-	1,286
37	0,643	0,643	-	-	-	-	-	-	-	1,286
38	-	0,643	0,643	-	-	-	0,643	-	-	3,864
39	-	0,643	-	-	-	-	-	-	1,935	0,643
42	4,514	-	1,286	0,643	-	-	-	-	-	6,443
44	-	-	-	0,643	0,643	-	0,643	-	-	1,929
45	9,034	5,806	11,619	9,034	9,678	3,227	2,578	-	-	50,976
47	1,286	-	-	-	-	-	-	-	-	1,286
48	0,643	-	-	-	-	0,643	0,643	-	-	1,929
50	1,935	3,227	2,578	2,576	0,643	-	-	-	-	10,961
51	6,455	2,578	1,935	-	-	-	-	-	-	10,968
52	8,391	4,514	3,227	1,935	1,286	1,286	-	-	-	20,639
55	-	1,286	-	-	-	-	-	-	-	1,286
56	0,643	-	-	-	-	-	-	-	-	0,643
58	163,332	94,253	47,769	32,279	21,303	20,010	6,455	1,935	1,286	388,622
<b>Total</b>	<b>229,155</b>	<b>125,855</b>	<b>72,284</b>	<b>47,112</b>	<b>34,196</b>	<b>25,809</b>	<b>10,962</b>	<b>1,935</b>	<b>3,221</b>	<b>550,529</b>

*Sup table*

Total stems by specieswise and diameter classwise (in 1,000 units)

Stratum : Evergreen

Table No. 3.1

Species Code	Diameter Class in cms.										Total
	10-19	20-29	30-39	40-9	50-59	60-69	70-79	80-89	90-99	100 +	
1	71.985	51.116	49.020	31.242	27.107	31.242	29.202	5.187	44.823	340.922	
2	6.236	5.187	3.089	5.187	3.089	0.990	2.040	-	0.990	26.808	
3	4.138	6.236	9.384	4.138	7.286	6.236	3.089	3.089	4.138	47.734	
4	4.138	6.236	7.286	7.286	9.384	5.187	8.335	2.040	5.187	55.079	
5	14.572	14.572	19.817	16.670	25.005	14.572	11.424	-	9.384	126.016	
6	5.187	4.138	2.040	6.236	1.138	7.286	8.335	6.236	9.384	52.980	
7	0.990	-	2.040	2.040	0.990	-	-	-	-	6.060	
8	11.424	10.375	10.375	6.236	6.236	3.089	2.040	-	-	49.775	
9	11.424	5.187	11.424	6.236	6.236	10.375	12.473	5.187	40.685	109.227	
10	124.153	77.175	82.419	58.404	35.439	18.768	3.089	0.990	6.236	406.671	
11	60.502	41.675	42.725	35.439	37.537	34.389	23.956	4.138	8.335	288.696	
12	46.921	44.823	35.439	36.488	35.439	25.005	19.817	7.286	26.054	275.173	
13	18.768	13.522	5.187	8.335	5.187	-	2.040	-	0.990	54.029	
15	4.138	-	5.187	2.040	2.040	0.990	0.990	0.990	2.040	18.415	
16	0.990	0.990	2.040	0.990	-	2.040	2.040	0.990	-	10.660	
17	21.858	23.556	26.054	17.719	14.572	9.384	4.138	0.990	2.040	120.711	
18	12.473	14.572	11.424	3.089	6.236	2.040	0.990	-	-	50.824	
20	3.089	12.473	4.138	3.089	0.990	0.990	-	-	-	23.779	
21	0.990	3.089	5.187	0.990	7.286	0.990	3.089	2.040	8.335	31.996	
22	0.990	2.040	2.040	2.040	0.990	4.138	2.040	0.990	3.089	18.557	
23	32.291	12.473	14.572	9.384	4.138	2.040	0.990	-	-	75.888	
24	-	0.990	-	-	0.990	-	-	-	3.089	5.069	
25	0.990	0.990	2.040	0.990	2.040	-	-	-	-	7.050	
28	5.187	0.990	2.040	-	-	-	-	-	-	8.217	
30	5.187	2.040	-	-	-	-	-	-	-	7.227	

*lab 2.1*  
*Table*  
*Page 76*  
*59.6.559*

*Table*  
*lab 2.3*  
*Page 76*  
*913.109*

*Page 77*  
*Table*  
*2.3*  
*69/397*

*Table*  
*15.444*  
*6.6.8.4*

*027*

*MARCHWOODS*

*Cuscuta*

*ornamental*

Species Code	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total
31	-	344,248	159,592	93,843	42,725	12,473	8,335	4,138	-	0,990	666,344
33	-	0,990	-	0,990	-	0,990	0,990	-	-	0,990	4,950
34	-	-	0,990	-	0,990	0,990	2,040	-	-	0,990	6,000
35	-	-	-	-	-	-	-	-	-	0,990	0,990
37	-	2,040	3,089	2,040	0,990	2,040	0,990	-	2,040	0,990	14,219
38	-	6,236	2,040	3,089	-	-	2,040	2,040	0,990	9,384	25,819
42	-	19,817	10,575	6,236	3,089	3,089	-	-	-	-	42,606
43	-	2,040	0,990	0,990	3,089	0,990	-	-	-	-	8,099
44	-	0,990	-	4,138	7,286	0,990	-	0,990	-	-	14,394
45	-	96,991	83,410	96,991	113,719	75,074	33,340	16,670	4,138	5,187	525,520
46	-	7,286	3,089	-	0,990	-	-	-	0,990	-	12,355
47	-	11,424	9,384	10,375	4,138	0,990	-	-	-	-	36,311
48	-	3,089	2,040	2,040	3,089	-	0,990	-	0,990	8,335	20,573
49	-	0,990	-	2,040	-	-	0,990	0,990	-	-	5,010
50	-	8,335	15,621	6,236	10,375	5,187	-	0,990	0,990	0,990	48,724
51	-	28,153	10,375	9,384	2,040	0,990	-	-	-	-	50,942
52	-	69,887	41,675	40,685	16,670	11,424	3,089	-	-	-	183,430
55	-	2,040	0,990	4,138	4,138	3,089	0,990	2,040	2,040	-	19,465
56	-	-	3,089	0,990	2,040	-	-	-	-	-	6,119
58	-	1727,772	917,103	534,151	278,558	187,745	96,991	52,109	18,768	34,389	3848,576
Total	-	2800,949	1618,697	1173,323	758,194	546,313	329,546	220,084	71,099	238,034	7756,239

N. 1282.5  
Page 78

5339.458

Non  
Checked

Total stems specieswise and diameter classwise (in '000 units)

Stratum : Littoral

Table No. 3.2

Species Code	Diameter Class in Cms.										Total
	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +		
2	-	-	0.150	0.150	-	-	-	0.301	0.150	0.751	
4	0.150	0.454	0.150	0.454	0.150	0.150	-	-	0.301	1.809	
5	0.605	0.150	-	-	0.301	0.150	-	-	0.301	1.507	
7	-	-	-	0.150	-	-	-	-	-	0.150	
8	0.150	-	-	-	-	-	-	-	-	0.150	
9	1.150	-	-	0.150	0.150	-	-	-	0.908	1.358	
10	0.605	1.816	1.362	1.211	0.605	0.454	-	-	-	6.053	
11	1.515	1.059	0.605	0.454	0.454	0.301	0.605	0.605	0.150	5.748	
12	0.301	0.301	0.150	-	-	-	0.605	-	-	1.357	
13	0.150	0.454	0.605	0.454	-	-	-	-	-	1.663	
17	-	0.150	-	-	-	0.150	-	-	-	0.300	
18	-	-	0.454	-	-	0.301	-	-	0.454	1.209	
21	-	-	-	-	0.150	-	-	-	-	0.150	
23	0.150	0.150	0.150	0.301	-	-	-	-	-	0.751	
24	12.271	11.362	8.634	7.726	5.453	3.787	4.241	2.726	5.302	61.502	
29	0.301	-	-	-	-	-	-	-	-	0.301	
31	2.423	2.271	0.757	0.150	-	-	0.301	-	-	5.902	
33	-	-	-	-	0.150	-	-	-	-	0.150	

=====

Species Code.	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total
37	-	-	0.150	0.301	0.150	0.150	0.150	-	-	0.901
38	-	-	-	0.150	0.150	-	-	-	0.150	0.450
42	0.454	0.301	0.301	-	-	-	-	-	-	1.056
44	0.454	-	-	-	-	-	-	-	-	0.454
45	0.301	0.301	0.150	0.301	0.301	0.150	0.454	0.301	0.150	2.409
46	-	-	-	-	-	-	-	-	0.150	0.150
47	1.969	0.454	-	0.605	0.301	0.150	-	-	-	3.479
48	-	0.150	-	0.150	-	-	0.150	-	0.150	0.600
50	-	-	-	-	-	0.150	-	-	-	0.150
51	-	0.150	-	0.150	-	-	-	-	-	0.300
58	27.421	13.482	7.575	4.999	4.089	3.635	2.726	0.454	1.211	65.592
<b>TOTAL</b>	<b>49.370</b>	<b>33.005</b>	<b>21.193</b>	<b>17.856</b>	<b>12.404</b>	<b>9.528</b>	<b>9.232</b>	<b>4.387</b>	<b>9.377</b>	<b>166.352</b>

Total stems specieswise and diameter classwise (in '000 units)

Stratum : Deciduous

Table No. 3.3

Species Code.	Diameter Class in cms.										Total
	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +		
1	9,034	9,678	5,163	3,871	10,970	1,286	5,163	1,935	5,163	52,263	
3	0,643	-	0,643	0,643	1,286	0,643	1,286	-	0,643	5,787	
4	0,643	-	0,643	2,578	1,286	1,286	0,643	-	-	7,079	
5	3,227	1,286	1,935	-	2,578	1,286	1,286	-	1,286	12,884	
6	0,643	-	0,643	0,643	1,286	0,643	0,643	0,643	1,935	7,079	
7	-	-	-	-	-	0,643	-	-	-	0,643	
8	7,742	1,286	3,871	0,643	1,286	0,643	-	0,643	-	16,114	
9	5,163	0,643	0,643	-	1,935	0,643	1,286	1,286	1,935	13,534	
10	9,678	1,935	7,099	7,099	3,227	2,578	-	-	-	31,616	
11	3,871	3,227	3,871	2,578	2,578	1,935	1,286	-	1,935	21,281	
12	14,198	4,514	1,935	4,514	7,099	5,163	2,578	1,286	3,227	44,514	
14	-	0,643	-	-	-	-	-	-	-	0,643	
15	0,643	-	1,935	0,643	-	-	-	-	-	3,221	
16	-	1,286	-	-	-	-	-	-	-	1,286	
17	5,163	3,871	1,286	1,935	0,643	1,286	-	-	-	14,184	
18	1,935	1,286	-	-	-	1,286	-	-	-	4,507	
20	-	1,286	-	0,643	-	-	-	-	-	1,929	
21	-	-	-	-	-	-	-	-	-	0,643	
22	-	0,643	0,643	-	0,643	-	-	-	-	3,215	
23	2,578	1,935	0,643	0,643	1,286	-	0,643	-	-	5,799	
25	-	0,643	0,643	-	-	-	-	-	-	1,286	
28	0,643	-	0,643	-	-	-	-	-	-	1,286	
31	32,279	11,619	3,227	-	0,643	-	-	-	-	47,768	

Species Code	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total
34	-	0.643	-	-	-	0.643	-	-	-	1.286
37	0.643	0.643	-	-	-	-	-	-	-	1.286
38	-	0.643	0.643	-	-	-	0.643	-	1.935	3.864
39	-	0.643	-	-	-	-	-	-	-	0.643
42	4.514	-	1.286	0.643	-	-	-	-	-	6.443
44	-	-	-	0.643	0.643	-	0.643	-	-	1.929
45	9.034	5.806	11.619	9.034	9.678	3.227	2.578	-	-	50.976
47	1.286	-	-	-	-	-	-	-	-	1.286
48	0.643	-	-	-	-	0.643	0.643	-	-	1.929
50	1.935	3.227	2.578	2.578	0.643	-	-	-	-	10.961
51	6.455	2.578	1.935	-	-	-	-	-	-	10.968
52	8.391	4.514	3.227	1.935	1.286	1.286	-	-	-	20.639
55	-	1.286	-	-	-	-	-	-	-	1.286
56	0.643	-	-	-	-	-	-	-	-	0.643
58	163.332	94.253	47.769	32.279	21.303	20.010	6.455	1.935	1.286	388.622
<b>TOTAL</b>	<b>294.959</b>	<b>160.017</b>	<b>104.523</b>	<b>73.545</b>	<b>70.299</b>	<b>45.130</b>	<b>25.776</b>	<b>7.728</b>	<b>19.345</b>	<b>801.322</b>

Volume (m<sup>3</sup>/haq. - specieswise and diameter classwise

Stratum : Evergreen

Table No. 4.1

PLYWOOD SPECIES

Species Code	Diameter Class (in cms.)								Total	
	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99		
1 <i>D. lit.</i>	0.707	0.863	1.341	1.514	1.592	2.570	3.157	0.740	11.235	23.560
2 <i>A. mang.</i>	0.056	0.073	0.072	0.201	0.214	0.091	0.228	-	0.204	1.139
3 <i>P. indica</i>	0.039	0.083	0.225	0.172	0.420	0.592	0.367	0.445	1.177	3.520
4 <i>T. indica</i>	0.030	0.092	0.282	0.364	0.756	0.602	1.271	0.403	1.773	5.576
5 <i>T. parviflora</i>	0.105	0.240	0.581	0.602	1.663	1.269	1.317	-	1.955	7.935
Total	0.937	1.354	2.501	2.853	4.645	5.132	6.340	1.591	16.374	41.727

Table No. 4.2

MATCHWOOD SPECIES

6	0.067	0.076	0.056	0.297	0.321	0.745	1.148	1.121	2.811	6.642
7	0.008	-	0.061	0.090	0.057	-	-	-	-	0.216
8	0.100	0.136	0.238	0.239	0.346	0.260	0.261	-	-	1.580
9	0.054	0.084	0.307	0.237	0.342	0.753	1.193	0.597	9.690	13.257
10	0.993	1.125	1.991	2.003	1.657	1.157	0.234	0.098	1.299	10.557
11	0.358	0.644	1.244	1.691	2.641	3.262	3.018	0.483	1.828	15.169
Total	1.580	2.065	3.897	4.557	5.364	6.177	5.854	2.299	15.628	47.421



Volume (m<sup>3</sup>)/ha. - specieswise and diameter classwise.

Stratum : Evergreen

Table No. 4.5

NON-COMMERCIAL WOOD SPECIES

Species Code	Diameter Class ( in cm. )										Total
	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +		
31	2.975	2.188	2.209	1.368	0.753	0.656	0.483	-	0.204	11.136	
32	0.009	-	0.020	-	0.057	0.094	-	-	0.193	0.373	
34	-	0.013	-	0.037	0.072	0.178	-	-	0.240	0.540	
35	-	-	-	-	-	-	-	-	0.223	0.223	
37	0.019	0.035	0.043	0.044	0.138	0.080	-	0.327	0.182	0.868	
38	0.054	0.033	0.068	-	-	0.097	0.221	0.161	2.263	2.997	
42	0.174	0.143	0.146	0.126	0.163	-	-	-	-	0.752	
43	0.018	0.013	0.030	0.121	0.053	-	-	-	-	0.235	
44	0.010	-	0.102	0.272	0.072	-	0.106	-	-	0.563	
45	0.857	1.188	2.368	4.384	4.367	2.826	1.885	0.663	1.466	20.004	
46	0.061	0.039	-	0.039	-	-	-	0.147	-	0.286	
47	0.099	0.121	0.250	0.166	0.072	-	-	-	-	0.708	
48	0.027	0.026	0.052	0.114	-	0.098	-	0.161	2.524	3.002	
49	0.008	-	0.049	-	-	0.097	0.106	-	-	0.260	
50	0.075	0.203	0.141	0.377	0.292	-	0.106	0.153	0.280	1.627	
51	0.243	0.131	0.219	0.078	0.053	-	-	-	-	0.724	
52	0.613	0.575	0.967	0.659	0.664	0.240	-	-	-	3.718	
55	0.019	0.016	0.105	0.166	0.215	0.076	0.238	0.309	-	1.144	
56	-	0.037	0.024	0.078	-	-	-	-	-	0.139	
58	15.336	12.480	12.694	10.979	11.214	8.265	5.839	2.856	9.219	88.882	
<b>Total</b>	<b>20.597</b>	<b>17.241</b>	<b>19.487</b>	<b>19.309</b>	<b>18.185</b>	<b>12.807</b>	<b>8.984</b>	<b>4.777</b>	<b>16.794</b>	<b>138.181</b>	

Volume (m<sup>3</sup>) / hac. - specieswise and diameter classwise.

Stratum : Littoral

Table No. 4.6

PLYWOOD SPECIES

Species	Diameter Class ( in cm. )									
	20-29	30-39	40-49	50-58	60-69	70-79	80-89	90-99	100 +	Total
2	-	-	0.127	0.237	-	-	-	1.961	1.372	3.697
4	0.041	0.382	0.248	1.097	0.587	0.841	-	-	6.781	9.977
5	0.159	0.113	-	-	0.882	0.625	-	-	3.263	4.982
<b>Total</b>	<b>0.200</b>	<b>0.495</b>	<b>0.575</b>	<b>1.334</b>	<b>1.409</b>	<b>1.466</b>	<b>-</b>	<b>1.961</b>	<b>11.416</b>	<b>18.656</b>

Table No. 4.7

MATCHWOOD SPECIES

7	-	-	-	0.318	-	-	-	-	-	0.318
8	0.053	-	-	-	-	-	-	-	-	0.053
9	0.022	-	-	0.287	0.361	-	-	-	6.490	7.160
10	0.190	1.105	1.424	1.833	1.225	1.223	-	-	-	7.000
11	0.369	0.789	0.648	0.893	1.421	1.188	3.243	4.344	1.251	14.145
<b>Total</b>	<b>0.634</b>	<b>1.894</b>	<b>2.072</b>	<b>3.331</b>	<b>3.007</b>	<b>2.411</b>	<b>3.243</b>	<b>4.344</b>	<b>7.741</b>	<b>28.677</b>



VOLUME (M<sup>3</sup>) PER HAC. - SPECIESWISE & DIAMETER CLASSWISE.

Stratum : Littoral

Table No. 4.10

NON-COMMERCIAL WOOD SPECIES

Species Code	Diameter Class ( in cm. )										Total
	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +		
31	0.934	1.319	0.801	0.237	-	-	1.382	-	-	-	4.673
33	-	-	-	-	0.745	-	-	-	-	-	0.345
37	-	-	0.163	0.510	0.404	0.577	0.840	-	-	-	2.294
38	-	-	-	0.298	0.367	-	-	-	-	1.226	1.891
42	0.177	0.198	0.298	-	-	-	-	-	-	-	0.668
44	0.181	-	-	-	-	-	-	-	-	-	0.181
45	0.119	0.178	0.185	0.508	0.779	0.486	2.157	2.047	1.298	1.298	7.757
46	-	-	-	-	-	-	-	-	-	-	1.298
47	0.737	0.262	-	1.064	0.825	0.495	-	-	-	-	3.383
48	-	0.076	-	0.287	-	-	0.696	-	1.689	-	2.748
50	-	-	-	-	-	0.504	-	-	-	-	0.504
51	-	0.110	-	0.266	-	-	-	-	-	-	0.376
58	10.563	8.337	8.400	9.142	10.657	14.103	14.290	3.012	15.948	-	94.452
<b>Total</b>	<b>12.711</b>	<b>10.480</b>	<b>9.842</b>	<b>12.312</b>	<b>13.377</b>	<b>16.165</b>	<b>19.365</b>	<b>5.059</b>	<b>21.459</b>	<b>120.770</b>	

VOLUME (M<sup>3</sup>) PER HAC. - SPECIESWISE & DIAMETER CLASSWISE

Stratum : Deciduous.

Table No. 4.11

PLYWOOD SPECIES

Species	Diameter Class ( in cm. )										Total
	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total	
1	0.956	1.626	1.489	1.667	6.891	1.067	6.479	2.656	11.648	34.459	
3	0.052	-	0.143	0.304	0.826	0.646	1.625	-	2.446	6.045	
4	0.049	-	0.199	1.528	1.197	1.430	1.113	-	-	5.516	
5	0.254	0.234	0.614	-	1.834	1.204	1.486	-	2.908	8.534	
<b>Total</b>	<b>1.291</b>	<b>1.860</b>	<b>2.448</b>	<b>3.499</b>	<b>10.748</b>	<b>4.347</b>	<b>10.703</b>	<b>2.656</b>	<b>17.002</b>	<b>54.554</b>	

Table No. 4.12

MATCHWOOD SPECIES

6	0.087	-	0.164	0.357	0.907	0.805	0.817	1.166	5.539	9.842
7	-	-	-	-	-	0.512	-	-	-	0.512
8	0.689	0.243	0.906	0.215	0.798	0.655	-	1.049	-	4.564
9	0.360	0.090	0.210	-	1.154	0.533	1.364	1.614	3.809	9.134
10	0.856	0.841	1.813	2.454	1.527	1.652	-	-	-	9.143
11	0.168	0.618	1.176	1.260	1.779	1.954	1.557	-	4.017	12.529
<b>Total</b>	<b>2.170</b>	<b>1.792</b>	<b>4.268</b>	<b>4.286</b>	<b>6.165</b>	<b>6.111</b>	<b>3.738</b>	<b>3.829</b>	<b>13.365</b>	<b>45.724</b>



VOLUME (M<sup>3</sup>) PER HAC. - SPECIESWISE & DIAMETER CLASSWISE

Stratum : Deciduous.

Table No. 4.15

NON-COMMERCIAL WOOD SPECIES

Species Code	Diameter Class ( in cm. )										Total
	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +		
31	2.345	1.679	0.762	-	0.428	-	-	-	-	-	5.714
34	-	0.107	-	-	-	0.504	-	-	-	-	0.611
37	0.067	0.120	-	-	-	-	-	-	-	-	0.187
38	-	0.071	0.150	-	-	-	0.761	-	0.716	-	1.698
39	-	0.113	-	-	-	-	-	-	-	-	0.113
42	0.398	-	0.274	0.210	-	-	-	-	-	-	0.882
44	-	-	-	0.266	0.367	-	0.851	-	-	-	1.484
45	0.818	0.911	2.987	3.520	5.931	2.795	3.075	-	-	-	20.037
47	0.105	-	-	-	-	-	-	-	-	-	0.105
48	0.053	-	-	-	-	0.539	0.761	-	-	-	1.353
50	0.184	0.469	0.711	1.122	0.397	-	-	-	-	-	2.883
51	0.574	0.391	0.448	-	-	-	-	-	-	-	1.413
52	0.763	0.698	0.880	0.817	0.734	1.120	-	-	-	-	5.012
55	-	0.169	-	-	-	-	-	-	-	-	0.169
56	0.054	-	-	-	-	-	-	-	-	-	0.054
58	14.589	12.897	11.722	13.619	13.339	17.620	7.589	3.008	4.371	-	98.754
<b>Total</b>	<b>20.450</b>	<b>17.625</b>	<b>17.934</b>	<b>19.554</b>	<b>21.196</b>	<b>22.578</b>	<b>13.037</b>	<b>3.008</b>	<b>5.087</b>	<b>140.464</b>	

138  
120  
140  
398

Total Volume by Specieswise & Diameter Classwise (in cu m<sup>3</sup>)

Stratum : Evergreen

Table No. 5.1

PIYWOOD SPECIES

Species Code	Diameter Class (in cm.)										Total
	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total	
1	41.214	50.523	78.188	76.613	92.795	150.274	184.037	43.188	656.611	1373.446	535.955
2	3.278	4.278	4.209	11.741	12.513	5.309	13.317	-	11.944	66.589	97.779
3	2.290	4.873	13.131	10.063	24.510	34.562	21.423	25.950	68.634	205.436	175.079
4	1.769	5.415	16.483	21.252	44.078	35.098	74.138	23.713	103.381	325.327	280.408
5	6.148	14.006	33.877	46.761	96.982	74.004	76.772	-	113.955	462.495	361.713
<b>Total</b>	<b>54.699</b>	<b>79.095</b>	<b>145.888</b>	<b>166.430</b>	<b>270.878</b>	<b>299.247</b>	<b>369.687</b>	<b>92.851</b>	<b>954.528</b>	<b>2433.303</b>	

Volume of extractable diam.

Above extractable diam.  
All dia class

2433.303

Table No. 5.2

MATCHWOOD SPECIES

6	3.914	4.432	3.319	17.314	18.727	43.454	66.944	65.341	163.864	387.305	359.326
7	0.515	-	3.557	5.255	3.378	-	-	-	-	12.705	3.378
8	5.844	7.956	13.900	13.654	20.217	15.183	15.268	-	-	92.322	50.668
9	3.193	4.898	17.345	13.869	19.985	43.896	69.544	34.854	564.827	773.011	733.106
10	57.902	35.582	116.069	116.766	96.622	67.444	13.658	5.750	75.770	615.563	259.244
11	20.898	37.568	72.539	98.595	153.970	190.146	175.935	28.157	106.565	884.373	654.713
<b>Total</b>	<b>92.266</b>	<b>120.436</b>	<b>227.329</b>	<b>235.753</b>	<b>312.895</b>	<b>360.123</b>	<b>341.349</b>	<b>134.102</b>	<b>911.026</b>	<b>2765.279</b>	

2765.279

2060.493  
~~259.991~~  
~~3.378~~  
~~92.322~~  
~~733.106~~  
~~723.146~~  
~~654.713~~

TOTAL VOLUME BY SPECIESWISE & DIAMETER CLASSWISE. (in 000 m<sup>3</sup>)

Stratum : Evergreen.

Table No. 5.3

CONSTRUCTIONAL WOOD SPECIES

Species Code.	Diameter Class (in cm.)										Total.
	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +		
12	27.625	31.795	44684	70.424	104.292	112.052	120.934	62.406	533.243	1106.855	932.927
13	9.173	10.772	6.494	14.499	12.353	-	8.116	-	35.794	97.201	56.263
15	1.915	-	9.743	6.252	9.071	5.086	7.445	8.298	106.754	154.554	136.638
16	0.539	0.961	3.289	2.117	-	9.770	15.783	9.300	-	41.829	44.153
17	13.264	21.773	38.099	37.075	45.238	32.784	20.790	6.744	15.968	231.735	121.524
18	6.577	14.333	20.098	9.513	24.533	11.478	7.109	-	-	93.671	43.120
20	1.616	11.101	5.701	6.689	4.244	-	-	-	-	29.351	4.244
21	0.493	2.632	7.827	2.187	23.287	4.638	21.352	18.752	126.749	207.917	194.778
22	0.485	1.379	2.893	4.221	4.091	20.216	14.433	9.899	39.473	97.090	88.112
23	19.454	13.131	28.117	32.291	21.145	13.856	10.172	-	-	138.166	45.173
24	-	0.765	-	-	2.816	-	-	-	27.304	30.885	30.120
25	0.639	0.689	3.050	1.986	8.338	-	-	-	-	14.702	8.332
<b>Total</b>	<b>81.780</b>	<b>109.361</b>	<b>169.395</b>	<b>187.324</b>	<b>259.408</b>	<b>209.870</b>	<b>226.134</b>	<b>115.399</b>	<b>885.285</b>	<b>2243.956</b>	<b>1705.400</b>

Table No. 5.4

ORNAMENTAL WOOD SPECIES

28	2.576	1.077	2.377	-	-	-	-	-	-	6.030	6.030
30	2.706	1.519	-	-	-	-	-	-	-	4.225	4.225
<b>Total</b>	<b>5.282</b>	<b>2.596</b>	<b>2.377</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>10.255</b>	<b>10.255</b>

12154

2243.956

10.255

TOTAL VOLUME - SPECIESWISE & DIAMETER CLASSWISE (IN 000 M<sup>3</sup>)

Stratum : Evergreen

Table No. 5.5.

NON-COMMERCIAL WOOD SPECIES

Species Code	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total
31	173.463	127.565	128.504	97.272	43.901	38.279	28.165	-	11.944	649.593
33	0.530	-	1.172	-	3.378	5.484	-	-	11.284	21.848
34	-	0.811	-	2.187	4.244	10.382	-	-	14.045	31.669
35	-	-	-	-	-	-	-	-	13.043	13.043
37	1.121	2.087	2.515	2.568	8.053	4.719	-	19.088	10.642	50.793
38	3.158	1.978	4.003	-	-	11.508	12.922	9.419	131.957	174.945
42	10.148	8.358	8.530	7.396	9.541	-	-	-	-	43.973
43	1.053	0.789	1.753	7.076	3.115	-	-	-	-	13.786
44	0.639	-	5.997	15.941	4.244	-	6.218	-	-	33.039
45	49.989	69.271	138.037	255.578	254.583	164.709	109.915	38.694	85.492	1166.328
46	3.508	2.305	-	2.292	-	-	-	8.609	-	16.814
47	5.807	7.093	14.617	9.704	4.244	-	-	-	-	41.465
48	1.583	1.561	3.031	6.673	-	5.754	-	9.419	147.172	175.193
49	0.484	-	2.882	-	-	5.663	6.218	-	-	15.247
50	4.410	11.853	8.207	21.993	17.033	-	6.218	-	-	95.047
51	14.177	7.671	12.774	4.591	3.115	-	-	-	-	42.328
52	35.740	33.532	56.390	38.444	38.750	14.003	-	-	-	216.859
55	1.111	0.961	6.145	9.703	12.582	4.478	13.907	18.051	-	66.938
56	-	2.171	1.421	4.604	-	-	-	-	-	8.196
58	887.526	727.488	739.960	640.000	653.690	481.801	340.395	166.522	537.398	5174.780
<b>Total</b>	<b>1194.547</b>	<b>1005.494</b>	<b>1136.298</b>	<b>1126.022</b>	<b>1060.473</b>	<b>746.840</b>	<b>523.958</b>	<b>278.753</b>	<b>979.299</b>	<b>8051.684</b>

Species of evergreen  
 Dipterocarp  
 have extractable  
 Aniradon

3565.000

8051.684

15504.477

7396288

Evergreen

7

- 103 -  
Total volume - Specieswise and diameter classwise (in .000 m<sup>3</sup>)

Stratum : Littoral

Table No. 5.6.

PLYWOOD SPECIES

Species Code.	Diameter Class ( in cm. )								Total		
	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99		100 +	
2	-	-	0.170	0.317	-	-	-	2.621	1.833	4.941	4.454
4	0.055	0.510	0.331	1.466	0.785	1.124	-	-	9.059	13.330	10.968
5	0.213	0.151	-	-	1.098	0.835	-	-	4.360	6.657	6.205
<b>Total</b>	<b>0.268</b>	<b>0.661</b>	<b>0.501</b>	<b>1.783</b>	<b>1.883</b>	<b>1.959</b>	<b>-</b>	<b>2.621</b>	<b>15.252</b>	<b>24.928</b>	

21.707

24.928

Table No. 5.7

MATCHWOOD SPECIES

7	-	-	-	0.424	-	-	-	-	-	0.424	0.000
8	0.071	-	-	-	-	-	-	-	-	0.071	0.000
9	0.029	-	-	0.383	0.483	-	-	-	8.671	9.566	9.184
10	0.254	1.477	1.903	2.449	1.637	1.634	-	-	-	9.354	3.271
11	0.493	1.054	0.865	1.193	1.899	1.587	4.333	5.804	1.672	18.900	15.295
<b>Total</b>	<b>0.847</b>	<b>2.531</b>	<b>2.768</b>	<b>4.449</b>	<b>4.019</b>	<b>3.221</b>	<b>4.333</b>	<b>5.804</b>	<b>10.343</b>	<b>38.315</b>	

27.720

38.315

Table No. 5.8.

CONSTRUCTIONAL WOOD SPECIES

Species Code	Diameter class ( in. cm. )										Total
	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total	
12	0.182	0.227	0.142	-	-	-	3.799	-	-	-	4.350
13	0.080	0.343	0.788	0.766	-	-	-	-	-	-	1.977
17	-	0.123	-	-	-	0.617	-	-	-	-	0.740
18	-	-	0.768	-	-	1.522	-	-	7.967	-	10.257
21	-	-	-	-	0.490	-	-	-	-	-	0.490
23	0.172	0.188	0.264	1.097	-	-	-	-	-	-	1.721
24	4.292	8.031	10.745	14.649	14.600	13.633	19.657	15.932	53.142	154.681	116.964
<b>Total</b>	<b>4.726</b>	<b>8.912</b>	<b>12.707</b>	<b>16.512</b>	<b>15.090</b>	<b>15.772</b>	<b>23.456</b>	<b>15.932</b>	<b>61.109</b>	<b>174.216</b>	

Total volume of utility class.  
 Above utility class.  
 All dia class  
 179.212  
 131.363

Volume of above equivalent to dia class

Table No. 5.9.

ORNAMENTAL WOOD SPECIES

29	0.144	-	-	-	-	-	-	-	-	-	0.144	0.000	0.000	0.144
<b>Total</b>	<b>0.144</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>0.144</b>	<b>0.000</b>	<b>0.000</b>	<b>0.144</b>

0.000  
 0.000  
 0.144

Table No. 5.10.

NON-COMMERCIAL WOOD SPECIES

Species Code	Diameter Class (in cm.)										Total
	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total	
31	1.248	1.762	1.071	0.317	-	-	1.847	-	-	6.245	
33	-	-	-	-	0.461	-	-	-	-	0.461	
37	-	-	0.217	0.682	0.540	0.770	1.122	-	-	3.331	
38	-	-	-	0.398	0.490	-	-	1.638	-	2.526	
42	0.236	0.264	0.392	-	-	-	-	-	-	0.892	
44	0.243	-	-	-	-	-	9	-	-	0.243	
45	0.160	0.238	0.248	0.679	1.041	0.650	2.882	2.755	1.734	10.367	
46	-	-	-	-	-	-	-	-	1.734	1.734	
47	0.980	0.350	-	1.421	1.102	0.661	-	-	-	4.518	
48	-	0.102	-	0.317	-	-	0.930	-	2.257	3.606	
50	-	-	-	-	-	0.673	-	-	-	0.673	
51	-	0.147	-	0.356	-	-	-	-	-	0.503	
58	14.112	11.138	11.222	12.213	14.238	18.842	19.091	4.024	21.307	126.187	
<b>Total</b>	<b>16.983</b>	<b>14.001</b>	<b>13.150</b>	<b>16.383</b>	<b>17.872</b>	<b>21.596</b>	<b>25.872</b>	<b>6.759</b>	<b>28.670</b>	<b>161.286</b>	

Handwritten notes and corrections in the table:

- 1.847 (written over 6.245)
- 2.461 (written over 0.461)
- 2.437 (written over 3.331)
- 2.128 (written over 2.526)
- 0.000 (written over 0.892)
- 0.000 (written over 0.243)
- 9.092 (written over 10.367)
- 1.734 (written over 1.734)
- 1.763 (written over 4.518)
- 3.187 (written over 3.606)
- 0.673 (written over 0.673)
- 0.000 (written over 0.503)
- 77.502 (written over 126.187)

982.191

695.001

398.889

281.559

Historical

Total volume - Specieswise and diameter classwise (in 1000 m<sup>3</sup>)

Stratum : Deciduous

Table No. 5.11.

PLYWOOD SPECIES

Species Code.	Diameter Class ( in cm. )						Total			
	20-29	30-39	40-49	50-59	60-69	70-79		80-89	90-99	100+
1	5.328	9.256	8.476	9.490	39.230	6.074	56.884	15,120	66,312	196,170
3	0.296	-	0.831	4.730	4.702	3.671	9.251	-	13,925	34,406
4	0.275	-	1.133	8.699	6.815	8.141	6.336	-	-	31,399
5	1.446	1.332	3.496	-	10.441	6.854	8.460	-	16,555	48,584
<b>Total</b>	<b>7.345</b>	<b>10,588</b>	<b>13,936</b>	<b>19,919</b>	<b>61,186</b>	<b>24,740</b>	<b>60,931</b>	<b>15,120</b>	<b>96,792</b>	<b>310,559</b>

Total volume of utility class  
 Above specified diameter  
 278.771  
 All diameters  
 310.559

Volume of above diameter  
 183.620  
 31.543  
 21.292  
 42.210

Table No. 5.12

MATCHWOOD SPECIES

6	0.495	-	0.934	2.032	5.164	4.583	4.651	6.638	30,509	55,028
7	-	-	-	-	-	2,915	-	-	-	2,915
8	3.979	1.383	5.152	1,224	4,543	3,729	-	5,972	-	26,005
9	2.049	0.512	1,186	-	6,570	3,034	7,765	9,189	21,685	52,022
10	4.873	4,788	10,321	13,971	8,693	9,405	-	-	-	52,062
11	0.955	3,518	6,695	7,173	10,128	11,124	8,858	-	22,869	71,338
<b>Total</b>	<b>12,352</b>	<b>10,201</b>	<b>24,298</b>	<b>24,400</b>	<b>35,098</b>	<b>34,790</b>	<b>21,274</b>	<b>21,799</b>	<b>75,063</b>	<b>259,275</b>

188.024  
 259 = 275

Total Volume - Specieswise and diameter classwise (in '000 m<sup>3</sup>)

Table No. 5.13

CONSTRUCTIONAL WOOD SPECIES

Species Code	Diameter Class ( in cm. )										Total
	20-29	30-39	40-9	50-59	60-69	70-79	80-89	90-99	100 +	Total	
12	8.540	3.205	3.194	8.773	22.465	24.833	16.999	10.350	45.020	143.201	119.667
14	-	0.512	-	-	-	-	-	-	-	0.512	0.000
15	0.199	-	3.996	1.896	-	-	-	-	-	6.091	0.000
16	-	1.082	-	-	-	-	-	-	-	1.082	0.000
17	3.273	3.604	1.776	3.945	1.913	4.708	-	-	-	19.230	6.621
18	0.917	1.110	-	-	-	7.042	-	-	-	9.074	7.642
20	-	0.845	-	1.418	-	-	-	-	-	2.260	0.000
21	-	-	-	-	2.300	-	-	-	-	2.300	0.000
22	-	0.575	0.928	-	4.145	-	4.913	-	-	10.571	9.300
23	1.480	2.346	1.196	2.141	-	-	-	-	-	7.167	9.058
25	-	0.609	1.002	-	-	-	-	-	-	1.611	0.000
<b>Total</b>	<b>14.209</b>	<b>13.886</b>	<b>12.092</b>	<b>18.173</b>	<b>30.823</b>	<b>36.583</b>	<b>21.612</b>	<b>10.350</b>	<b>45.020</b>	<b>203.048</b>	<b>149.688</b>

Table No. 5.14

ORNAMENTAL WOOD SPECIES

28	0.325	-	0.877	-	-	-	-	-	-	1.206	0.000
<b>Total</b>	<b>0.325</b>	<b>-</b>	<b>0.877</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>1.206</b>	<b>0.000</b>

203 = 048

1.206

0.000

Total Volume - Specieswise and diameter classwise (in '000 m<sup>3</sup>)

Stratum : Deciduous.

Table No. 5.15.

NON-COMMERCIAL WOOD SPECIES

Species Code.	Diameter Class ( in cm. )										Total	
	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 +	Total		
31	16.197	9.559	4.338	-	2.437	-	-	-	-	-	32.535	2.437
34	-	0.609	-	-	-	2.869	-	-	-	-	3.478	2.869
37	0.381	0.683	-	-	-	-	-	-	-	-	1.070	0.100
38	-	0.404	0.854	-	-	-	4.332	-	43.927	-	49.523	48.259
39	-	0.643	-	-	-	-	-	-	-	-	0.643	0.100
42	2.266	-	1.560	1.196	-	-	-	-	-	-	5.026	0.100
44	-	-	-	1.514	2.089	-	4.845	-	-	-	8.454	6.934
45	4.657	5.186	17.005	20.039	33.765	15.912	17.506	-	-	-	114.088	67.183
47	0.598	-	-	-	-	-	-	-	-	-	0.598	0.100
48	0.302	-	-	-	-	3.069	4.332	-	-	-	7.708	7.708
50	1.048	2.670	4.048	6.388	2.260	-	-	-	-	-	16.424	16.424
51	5.268	2.230	2.550	-	-	-	-	-	-	-	8.044	8.044
52	4.344	3.974	5.010	4.651	4.179	6.376	-	-	-	-	28.550	10.555
55	-	0.962	-	-	-	-	-	-	-	-	0.962	0.100
56	0.307	-	-	-	-	-	-	-	-	-	0.307	0.100
58	88.053	73.423	66.733	77.533	75.939	100.311	43.204	17.125	24.884	261.463	562.234	261.463
<b>Total</b>	<b>116.423</b>	<b>100.343</b>	<b>102.098</b>	<b>111.321</b>	<b>120.669</b>	<b>128.537</b>	<b>74.219</b>	<b>17.125</b>	<b>68.811</b>	<b>839.546</b>	<b>839.546</b>	<b>839.546</b>

Deciduous

Total of Stratum all Stratum

Patel Volume of utility class.  
 Above specified die class.  
 All die class.  
 17515.5794  
 1612.428  
 2698.641  
 1020.844  
 409.361  
 839 = 546

Volume/ha. in (m<sup>3</sup>) by stratum and utility classes  
 Table No. 6.0

Stratum	Utility Volume/Ha. ( in m <sup>3</sup> )					
	Plywood	Match wood	Constructional wood	Non-commercial wood	Residual wood	Small wood
Littoral	14,026	23,813	99,551	78,497	67,008	15,417
Deciduous	40,019	36,921	25,232	84,517	76,827	19,432
Evergreen	30,703	19,065	29,051	76,934	71,979	18,260
Entire Project	31,174	38,567	30,157	77,628	72,301	18,304

Table No. 7.0

Total Utility Volume ( in 1000 m<sup>3</sup> )

Stratum	Area (in ha.)	Total Utility Volume ( in 1000 m <sup>3</sup> )					
		Plywood	Match wood	Constructional wood	Non-commercial wood	Residual wood	Small wood
Littoral	1336	18,739	31,815	133,001	104,872	89,523	20,598
Deciduous	5693	227,830	210,195	143,467	481,158	437,381	110,630
Evergreen	58288	1789,672	2277,053	1693,334	4484,377	4195,557	1064,339
Total	65317	2036,241	2519,063	1969,802	5070,407	4722,461	1195,567

Per hectare total volume (m<sup>3</sup>) by stratum and diameter classwise.

Table No. 8.0

	Diameter Class (in cm.)								Total	
	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99		100+
Stratum	24,5092	22,5947	28,8448	29,9469	32,6597	27,7259	25,0676	10,6559	63,9951	265,9998
Evergreen	17,1978	19,5464	21,8063	29,2941	29,0967	31,8529	40,1686	23,2917	86,3614	298,6154
Littoral	26,4785	23,7285	26,9372	30,5407	43,5318	39,4713	31,3333	11,3135	50,1863	283,5211
Deciduous										
Entire	24,531	22,631	28,534	29,985	35,534	28,834	25,999	10,971	63,248	268,268
Project										

Total wood volume (in '000 m) by Stratum and diameter classwise.

Table No. 9.0

Evergreen	1428,597	1317,000	1681,307	1745,545	1903,668	1616,092	1461,140	621,114	3730,151	15504,614
Littoral	22,975	26,114	29,133	39,137	38,873	42,555	53,665	31,117	115,378	398,947
Deciduous	150,742	135,086	153,352	173,868	247,826	224,710	178,380	64,408	285,711	1614,084
Total	1602,314	1478,200	1863,793	1958,559	2190,367	1883,357	1693,185	716,639	4131,240	17517,645

Table No. 10.0

Per ha. distribution of stems diameter classwise and stratawise

STRATUM	D I A M E T E R C L A S S ( I N C M. )										Total
	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100+	100 + Total	
Littoral	35,961	24,713	15,870	13,374	9,292	7,139	6,914	3,286	7,006	124,614	
Deciduous	51,824	28,690	18,371	12,928	12,361	7,938	4,536	1,361	3,402	141,410	
Evergreen	48,079	27,799	20,155	13,031	9,397	5,674	3,795	1,235	4,099	133,265	

Table No. 11.0

Total stems - diameter classwise stratawise (in 3000)

STRATUM	Net Forest area (in ha.)	D I A M E T E R C L A S S ( I N C M. )									
		20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100 + Total	
Littoral	1336	49,380	33,017	21,202	17,868	12,414	9,538	9,237	4,390	9,360	166,484
Deciduous	5693	295,034	163,332	104,586	73,599	70,371	45,191	25,823	7,748	19,368	805,047
Evergreen	58288	2802,429	1620,348	1174,795	759,551	547,732	330,726	221,203	71,986	238,923	7767,750
Total	65317	3146,843	1816,697	1300,583	851,018	630,517	385,455	256,263	84,124	267,651	8739,281
Stems per hectare	-	48.18	27.80	19.90	13.02	9.65	5.90	3.92	0.74	4.10	133.71

TABLE NO. 12.0

CULL PERCENTAGES BY DIAM. CLASS  
LITTLE ANDAMAN

<u>Diameter Class</u>		<u>Cull %</u>
20 - 30	-	0.1
30 - 40	-	0.2
40 - 50	-	0.4
50 - 60	-	0.8
60 - 70	-	1.1
70 - 80	-	1.4
80 - 90	-	1.7
90 - 100	-	2.3
100-110	-	2.6



TABLE NO. 14.0

CYCLONE DAMAGE STUDY FOR EVERGREEN  
AND  
LITTORAL STRATUM

Diameter (in cm.)	% of damage by stem		% of damage by volume	
	Evergreen Strata	Littoral Strata	Evergreen Strata	Littoral Strata
20 - 29	24.98	14.34	6.10	3.52
30 - 39	15.13	9.82	5.87	3.85
40 - 49	10.90	7.20	8.02	4.97
50 - 59	7.34	3.05	8.06	3.54
60 - 69	5.23	2.18	9.15	3.24
70 - 79	2.89	2.62	6.75	6.06
80 - 89	1.78	2.62	6.57	9.25
90 - 99	0.61	0.22	1.87	0.93
100 +	1.55	1.09	15.40	11.45
<b>Total</b>	<b>70.44</b>	<b>43.20</b>	<b>67.74</b>	<b>46.81</b>

TABLE NO. 15.0

Little Andaman witnessed a severe cyclonic damage that started on 29th December, 1979.

An attempt was made to estimate the percentages of damage for commercially important species. The study was restricted to two strata namely Evergreen and Littoral.

The observations are tabulated as below :-

STRATUM - EVERGREEN

Species Name	% damage
Dipterocarpus	41.9
Amoora wallichii	83.3
Parishia insignis	57.1
Terminalia bialata	62.5
Terminalia procera	59.5
Canarium euphyllum	85.2
Artocarpus chaplasha	82.7
Over all damage % for the Stratum	70.4

STRATUM - LITTORAL

Species Name	% damage
Terminalia bialata	75.0
Terminalia procera	28.6
Salmalia insignis	50.1
Sideroxylon langetpetiolatum	63.6
Manilkara littoralis	16.26
Pterocymbium tinctorium	60.9
Over all damage % for the Stratum	43.2

TABLE NO. 16.0

LIST OF LITTLE ANDAMAN SPECIES ENUMERATED  
WITH THEIR CODE NUMBERS.

<u>Sl.No.</u>	<u>Local Name</u>	<u>Botanical Name</u>	<u>Code No.</u>
1	Gurjan	Dipterocarpus species	001 ✓
2	Lalchini	Amoora wallichii	002 ✓
3	Red Dhup	Parishia insignis	003 ✓
4	White Chuglam	Terminalia bialata	004 ✓
5	Badam	Terminalia procera	005 ✓
6	White Dhup	Canarium euphyllum	006 ✓
7	Bakota	Endospermum malaccense	007 ✓
8	Kadam	Anthocaphalus cadamba	008 ✓
9	Didu	Salmalia insignis	009 ✓
10	Lambapatti	Sideroxylon langepetiolatum	010 ✓
11	Papita	Pterocymbium tinctorium	011 ✓
12	Toung peinne	Artocarpus chaplasha	012 ✓
13	Lakuch	Artocarpus lakoocha	013 ✓
14	Thingan	Hopea odorata	014 ✓
15	Jhingam	Pajanelia longifolia	015 ✓
16	Jwegyi	Adenantha pavonina	016 ✓
17	Red Bamowe	Planchonia andamanica	017 ✓
18	Hill Mohwa	Diploknema butyracea	018 ✓
19	Gangaw	Mesua ferrea	019 ✓
20	Nabbe	Lanea coromandelica	020 ✓
21	Pyinma	Lagerstroemia hypoleuca	021 ✓
22	Black Chuglam	Terminalia manii	022 ✓
23	Poon	Calophyllum inophyllum	023 ✓
24	Sea Mohwa	Manilkara littoralis	024 ✓
25	Koko	Albizzia lebbek	025 ✓
26	Silvery grey	Terminalia bialata	026 ✓
27	Chooi	Sageraea elliptica	027 ✓
28	Marble wood	Diospyros marmorata	028 ✓
29	Satin wood	Murraya paniculata	029 ✓
30	Thitmin	Podocarpus nerifolia	030 ✓
31	Jaiphal	Myristica species	031 ✓
32	Duabanga	Duabanga sonneritioides	032 ✓
33	Bermaza	Albizzia stipulata	033 ✓
34	Jangliam	Mangifera andamanica	034 ✓
35	Evoidia	Evodia glabera	035 ✓
36	Ailanthus	Ailanthus kurzii	036 ✓
37	Chattiam	Alstonia scholaris	037 ✓
38	Thitook	Tetrameles nudiflora	038 ✓
39	Lithok	Pterygota alata	039 ✓
40	-	Garcinia species	040 ✓
41	Gmelina	Gmelina arborea	041 ✓
42	Safed chikka	Sterculia villosa	042 ✓
43	Ambera	Spondias mangifera	043 ✓
44	Thinkala	Nauclea ga-gena	044 ✓
45	Thit Kandu	Pometia pinata	045 ✓
46	Jungli lakuch	Antiaris toxicaria	046 ✓
47	Jamun	Eugenia species	047 ✓
48	Jangli Neem	Ganophyllum falcatum	048 ✓

<u>Sl.No.</u>	<u>Local Name</u>	<u>Botanical Name</u>	<u>Code No.</u>
/49	Safed Badham	Terminalia catappa ✓	-049 ✓
/50	Jangli Sagwan	Milusa tectona ✓	-050 ✓
/51	Latuk	Aglaia andamanica ✓	-051 ✓
/52	Latpyaw	Xanthophyllum andamanicum ✓	-052 ✓
53	Elaeocarpus	Elaeocarpus species	053 ✓
54	Ye-padauk	Bischofia javanica ✓	-054 ✓
/55	Korkot	Dillenia pentagyna ✓	-055 ✓
/56	Kala Lekuch	Artocarpus gomeziana ✓	-056 ✓
57	Khari Kapash	Hibiscus tiliaceus ✓	-057 ✓
/58	Others		058 ✓

Table No. 17.D

VOLUME TABLE - IMPORTANT COMMERCIAL SPECIES FOR LITTLE ANDAMAN

Diameter Class (In cm.)	S P E C I E S											OTHERS			
	Dipterocarpus species	Terminalia bialata	Terminalia procera	Canarium euphyllum	Salmalia insignis	Sideroxyllum longepetiolatum	Pterocymbium tincorium	Artocarpus chaphasha	Artocarpus lakoocha	Pajanelia longifolia	Planchonla andamanica		Diploknema bubyracea	Calophyllum	Martilakara litorea
20 - 29	0.5644	0.4593	0.4230	0.7483	0.3062	0.4644	0.3529	0.5751	0.4622	0.4447	0.5929	0.4922	0.4911	0.3343	0.5008
30 - 39	0.9746	0.9892	0.9950	1.1310	0.8260	0.8682	0.9069	0.7199	0.7812	1.0924	0.9397	0.9199	0.9563	0.7088	0.7997
40 - 49	1.6008	1.8657	1.7543	1.8637	1.4814	1.3888	1.7009	1.1887	1.2221	1.9061	1.4505	1.6475	1.8653	1.2271	1.3597
50 - 59	2.4430	3.0888	2.7007	2.9646	2.2697	2.0260	2.7349	1.9815	1.7847	2.8858	2.1253	2.6752	3.2181	1.8842	2.3006
60 - 69	3.5012	4.6584	3.8344	4.3791	3.1919	2.7799	4.0089	3.0983	2.4691	4.0315	2.9641	4.0028	5.0147	2.6951	3.5026
70 - 79	4.7754	5.5747	5.1552	6.1618	4.2478	3.6505	5.5229	4.5391	3.2754	5.3432	3.9669	5.6305	7.2552	3.6448	5.0055
80 - 89	6.2656	8.8376	6.6632	8.2945	5.4375	4.6377	7.2769	6.3039	4.2034	6.8209	5.1337	7.5581	9.9394	4.7383	6.8095
90 - 99	7.9718	11.4470	8.3585	10.7772	6.7610	5.7417	9.2709	8.3927	5.2532	8.4646	6.4645	9.7858	13.0674	5.9756	8.9144
100 +	9.8940	14.4031	10.2409	13.6099	8.2183	6.9623	11.5049	10.8055	6.4249	10.2743	7.9493	12.3134	16.6392	7.5567	11.3204

APPENDIX - 1

THE ALPHABETICAL NAME OF ENUMERATED LITTLE  
ANDAMAN SPECIES

Sl. No.	Botanical Name	Local Name
1	<i>Adenanthera pavonina</i>	Jwegyi (Twegyi)
2	<i>Aglafia andamanica</i>	Latuk
3	<i>Ailanthus kurzii</i>	Ailanthus
4	<i>Albizzia lobbok</i>	Koko
5	<i>Albizzia stipulata</i>	Bermaza
6	<i>Alstonia scholaris</i>	Chattiam
7	<i>Amoora wallichii</i>	Ialchini
8	<i>Antiaris toxicaria</i>	Jungli Lakuch
9	<i>Anthocaphalus cadamba</i>	Kadam
10	<i>Artocarpus chaplasha</i>	Toung peinne.
11	<i>Artocarpus lakoocha</i>	Lakuch
12	<i>Artocarpus gomeziana</i>	Kala Lakuch
13	<i>Bischofia javanica</i>	Ye - padauk
14	<i>Hibiscus tiliaceus</i>	Khari Kapash
15	<i>Canarium . . . . . euphyllum</i>	White Dhup
16	<i>Calophyllum inophyllum</i>	Poon
17	<i>Dipterocarpus species</i>	Gurjan
18	<i>Diploknema butyracea</i>	Hill Mohwa
19	<i>Diospyros marmorata</i>	Marble wood
20	<i>Duabanga grandiflora</i>	Duabanga
21	<i>Dillenia pentagyna</i>	Korkot.
22	<i>Endospermum malaccense</i>	Bakota
23	<i>Evodia glabra</i>	Evodia
24	<i>Eugenia species</i>	Jamun
25	<i>Elaeocarpus species</i>	Elaeocarpus
26	<i>Garcinia species . . . . .</i>	-
27	<i>Gmelina arborea</i>	Gmelina
28	<i>Ganophyllum falcatum</i>	Jangli Neem
29	<i>Hopea odorata</i>	Thingan
30	<i>Lannea coromandelica</i>	Nabbe
31	<i>Lagerstroemia hypoleuca</i>	Pyinma
32	<i>Mesua ferrea</i>	Gangaw
33	<i>Manilkara littoralis</i>	Sea Mohwa
34	<i>Murraya paniculata</i>	Satin wood
35	<i>Myristica species</i>	Jaiphal
36	<i>Mangifera andamanica</i>	Jangli-am
37	<i>Milusa tectona</i>	Jangli sagwan
38	<i>Nauclea gageana</i>	Thinkala
39	<i>Parishia insignis</i>	Red Dhup

Sl.No.	Botanical Name	Local Name
40	<i>Pterocymbium tinctorium</i>	Papita
41	<i>Pajanelia longifolia</i>	Jhingam
42	<i>Planchonia andamanica</i>	Red Bamboe
43	<i>Podocarpus nerifolia</i>	Thitmin
44	<i>Pterygota alata</i>	Litkok
45	<i>Pometia pinata</i>	Thit Kandu
46	<i>Salmalia insignis</i>	Didu
47	<i>Sideroxylon langepetiolatum</i>	Lambapatti
48	<i>Sageraea elliptica</i>	Chooi
49	<i>Sterculia villosa</i>	Safed chilka
50	<i>Spondias mangifera</i>	Ambera
51	<i>Terminalia bialata</i>	White chuglam
52	<i>Terminalia procera</i>	Badham
53	<i>Terminalia manii</i>	Black chuglam
54	<i>Tetrameles nudiflora</i>	Thitpok
55	<i>Terminalia catappa</i>	Safed Badham
56	<i>Xanthophyllum andamanicum</i>	Latgpyaw
57	Others	-

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