Ministry of Forestry

Forest Department

Taninthayi Nature Reserve Project

Report on Tree and Bamboo Species Survey in Taninthayi Nature Reserve

Submitted by

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Taninthayi Nature Reserve Project

Final Report on Tree and Bamboo Species Survey in Taninthayi Nature Reserve

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SUMMARY

The Floristic survey on tree species and bamboo species has been conducted in Taninthayi Nature Reserve, which was located in Yaebyu Township, Taninthayi Division. The vegetation of the area is the tropical moist evergreen forest. The main objective of the study is to record and indentify the tree and bamboo species growing wild in the TNR and the composition, distribution and frequency of each species is calculated to verify their diversity and richness. So that it may play a critical part in the process of management plan of TNR.

The survey was conducted using random sample plotting and random Transecting Methods. The 20m x 20m & 30m x 30m sample plots for tree species and 30m x30m plots for bamboo species were set up to get representative sample of the area concerned. The population of each species in the plot was counted to analyze the density and frequency of the species concerned. The common species in the TNR were *Swintonia floribunda* (Shit-lae), *Amoora wallichii* (Gat-ni), *Syzygium claviflorum* (Tha-bye), *Diospyros* sp. (Taung-bok), *Lithocarpus* sp. (Bigyan), *Castanopsis* sp. (Bigyan), and *Pentace griffithii* (Thit-sho). The rare species were *Anisoptera* sp. (Ka-ban), *Dipterocarpus* sp. (Ka-nyin), *Cinnamomum multiflorum* (Karawe) and *Lagerstroemia* sp. (Pyin-ma). The very rare species were *Hopea odorata* (Thin-gan), *Pentace burmanica* (Thit-kha), *Dillenia indica* (Tha-byu), *Albizia lebbek* (Kokko), *Michelia champaca* (San-ga), *Xylia xylocarpa* (Pyin-ka-do) and *Alpingia excels* (Hni n-pa-yok).

The types of forest were hill evergreen in the high lands and evergreen or semi evergreen in the low slopes to mix deciduous, the deciduous and degraded secondary forest in the lowland.

The disturbances to the ecology of the study areas are encroachments, logging, hunting and industrial plantations, seasonal fire, erosion, landslides and seasonal strong wind due to storms. The community based management programs such as community forestry and agro forestry establishments, preventive measure of monoculture plantation and creation of income generation for socio-economic development of local community should be implemented to mitigate some anthropogenic impacts.

1. INTRODUCTION

1.1 Union of Myanmar

Myanmar is one of the largest countries on mainland Southeast Asia. It has a total land area of 677,000 square kilometers and shares borders with five countries for about 6151 kilometers sharing 274 kilometers with Bangladash on the West, 1339 kilometers with India on the North-West, 2205 kilometers with China on the North-East, 225 kilometers with Laos on the East and 2108 kilometers with Thailand on the South-East. It has a total coastline of 2229 kilometers (NCEA 2009).

The population of Myanmar in the fiscal year 2005/06 estimated at 55.4 millions. Myanmar is a nation of many nationalities speaking over one hundred languages and dialects, but living in closed harmony.

1.2 Taninthayi Division

Taninthayi division is located in the Southern part of Myanmar, definitely between north latitude 9º 32' and15º 05', east longitude 97º 40' and 99º 40', lying as a narrow strip. It is bounded on the north by Mon State, on the east and south by Thailand and on the west by the Andaman Sea.The area of Taninthayi division is 16736 sq. miles (43346 sq. kilometer). It comprises three Districts, Dawei, Myeik and Kawthaung.

The natural environment of Taninthayi division is interesting. Nwalabo range and Taninthayi Yoma Range run from northwest to southeast and Myint-mo-let-khat point is the highest point of 6891 ft. The coastal plain is narrow and lowland areas are found along Dwei River and near Myeik.The islands along the coast are the upper parts of submerged mountain range. The groups of islands trending parallel to the coast are Heinze group, Maungmagan group, Launglon group and Myeik archipelago which comprises 800 islands. A volcano is found in Medaw island of Myeik group. The Great Taninthayi River, taking its source in TaninthayiYoma in north-sourth direction between the two ranges, bends westwards to enter the Andaman Sea. The little Taninthayi River flowing from south to north joins the Great Taninthayi River.

The estimated population was 1.35 million in 2000 and estimated male and female ratio is equal.The majority of the peoples are Bamar group comprising Bamar, Dwei dialect, Myeik dialect and Salon.Others are Kayin, Mon and Pashu and foreigeners, mostly Chinese and Indians.

1.3 Taninthayi Nature Reserve

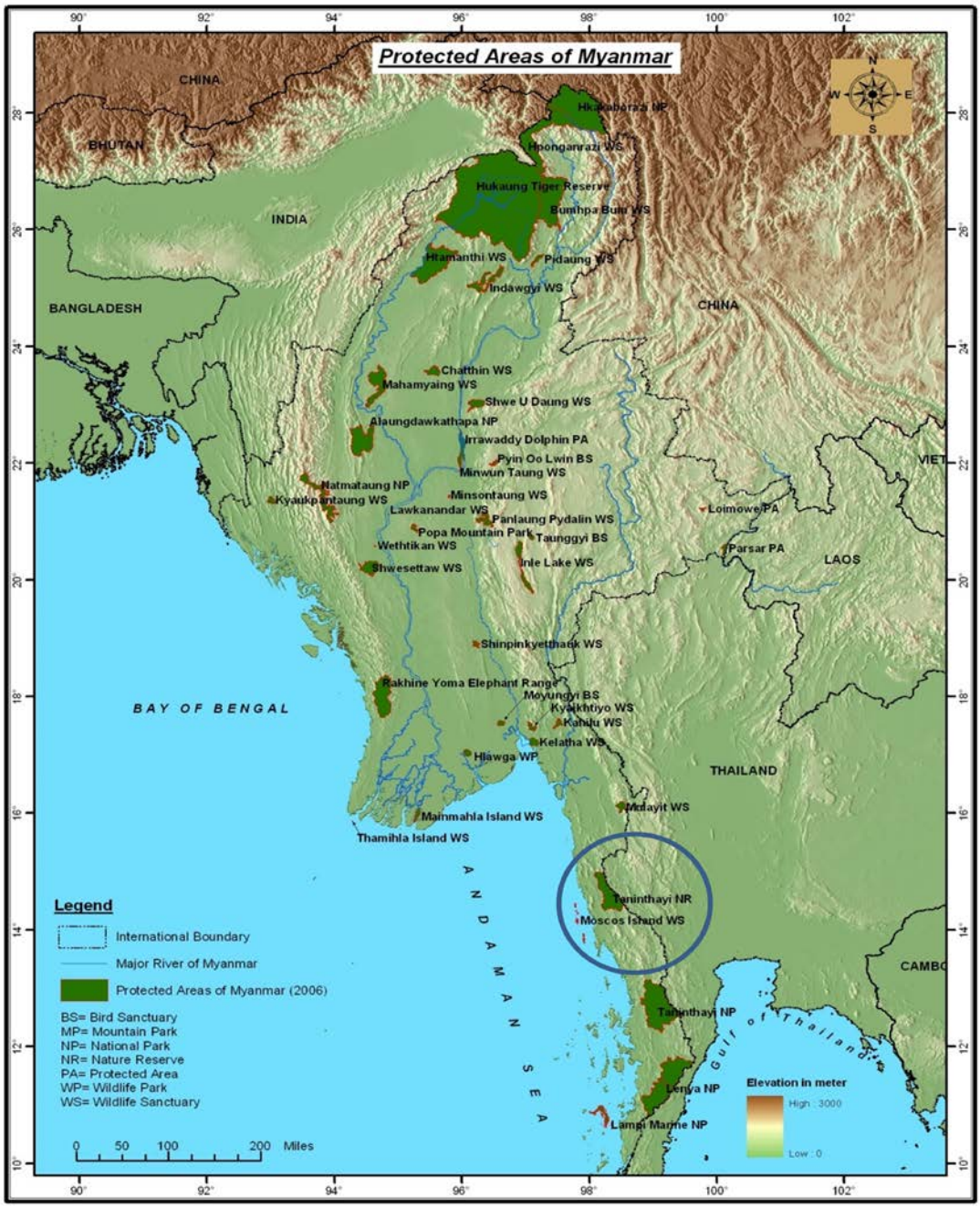
In 2005, Ministry of forestry, Government of the union of Myanmar, notified that the area which is 420077 acre (or) 656.37 square miles, situated in Dawei District, Taninthayi Division as the 'Taninthayi Nature Reserve' on the date of 30th March, 2005 (the 6th Waning

of Tabaung, 1366 ME). The aim of this notification is to conserve tropical rainforest and their constituent biodiversity in the Taninthayi region of southern Myanmar.

1.3.1 Location

Taninthayi Nature Reserve is situated at the Dawei District, Taninthayi Division, between the Dawei River and Myanmar-Thailand border, between latitudes 14º 20' 50" and 14º 57' 55" North and between longitudes 98º 5' 10" and 98º 31' 32" East. Administratively, its location is in Yebyu and Dawei Township of Dawei District in the northern part of Taninthayi Division in the southern Myanmar (Map 1).

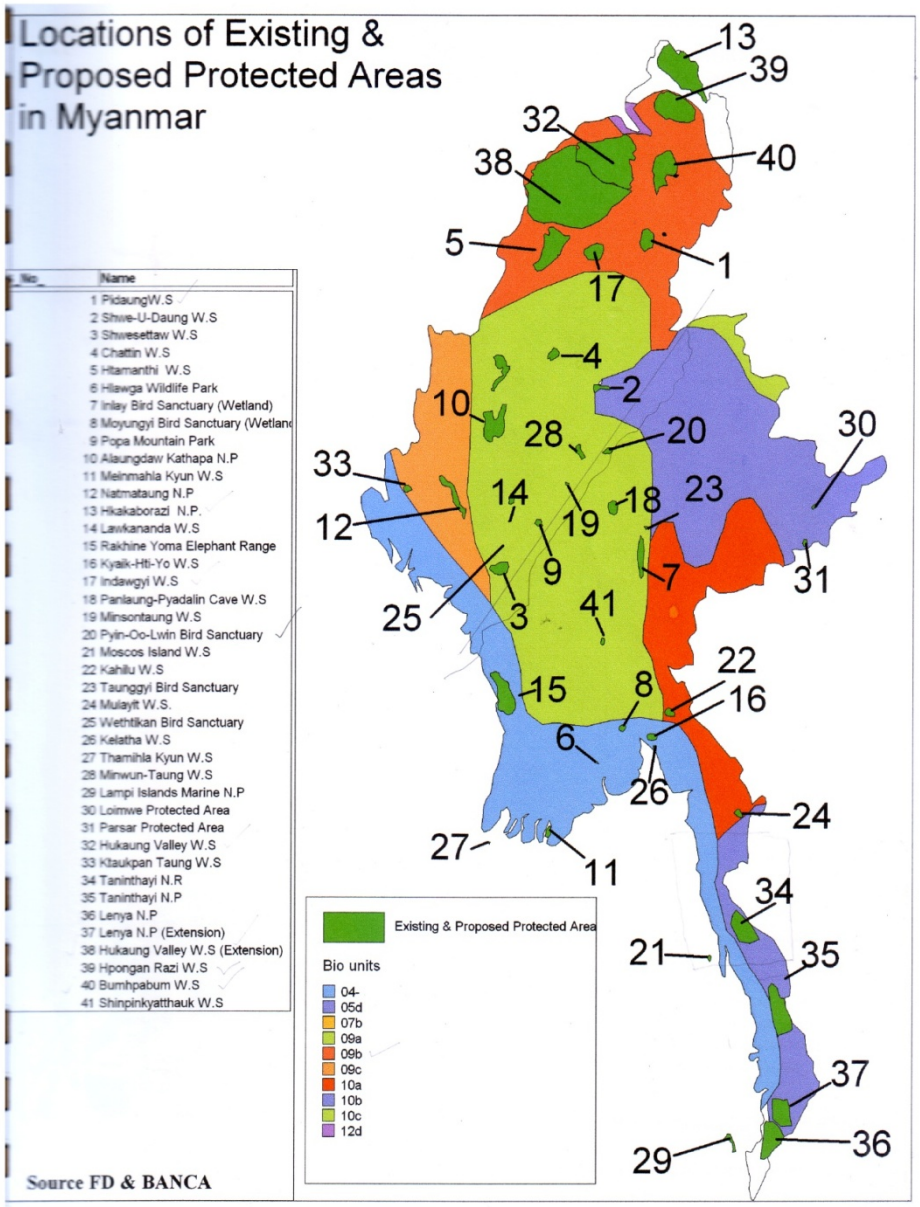
Map 1



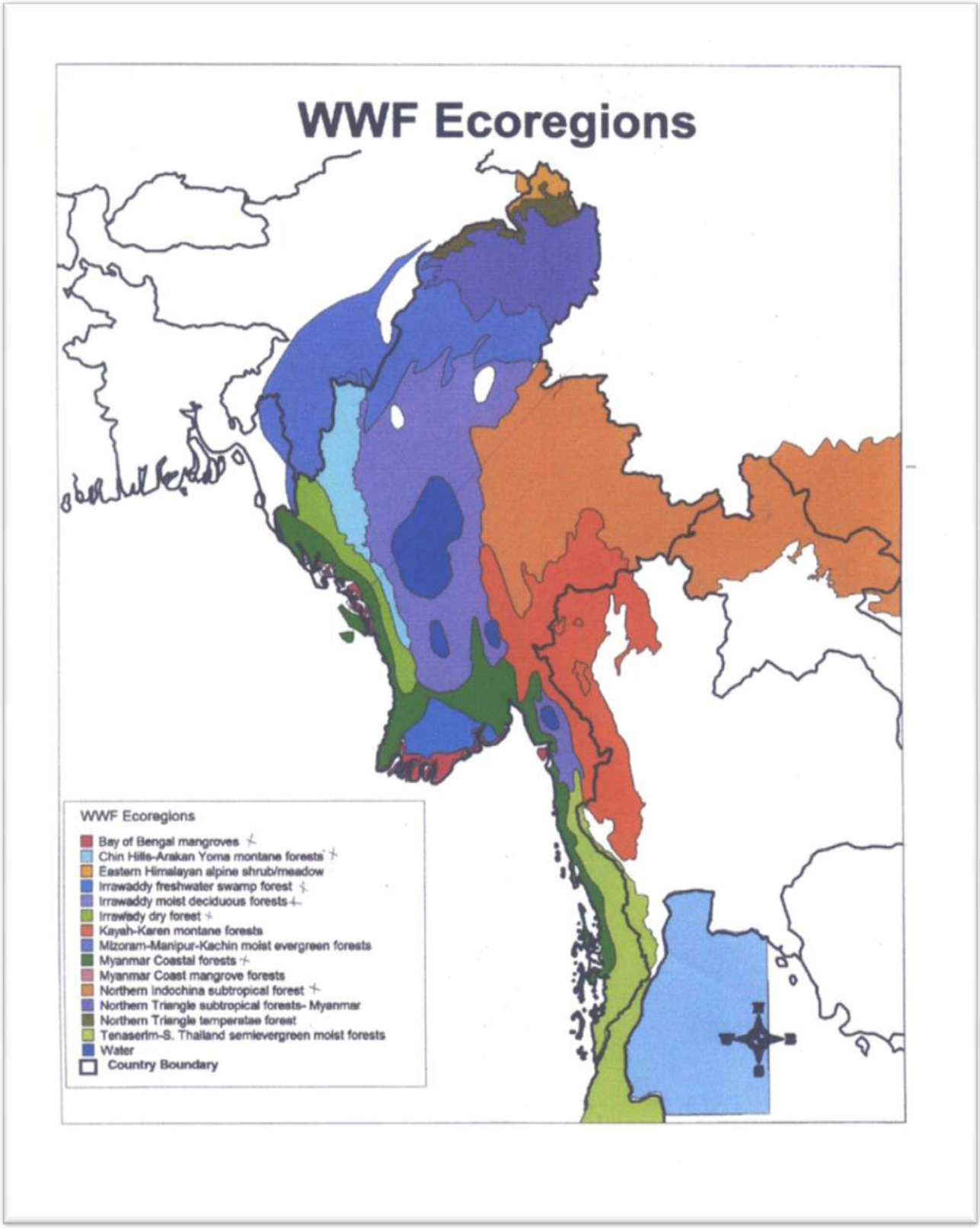
1.3.2 Area

The area of Taninthayi Nature Reserve comprises two reserves, viz., the eastern parts of Heinze/ Kaleinaung Reserve Forest 85,725 ha. (211,836 acre) and Luwaing Reserve Forest 84,273 ha.(208,240 acre). This area encompasses approximately 17, 00 square kilometers (657 square miles) or 170,000 hectare (420,077 acre). The size of this area is the largest protected area compare to other countries of the region (Map 2). It lies in the Ecoregion of Tenasserin-South Thailand Semi-Evergreen Rain Forests and harbors globally outstanding levels of species richness. (Map 3).

Map 2



Map 3


WWF Ecoregions
WWF Ecoregions
Bay of Bengal mangroves
Chin Hills-Arakan Yoma montane forests
Eastern Himalayan alpine shrub/meadow
Irrawaddy freshwater swamp forest
Irrawaddy moist deciduous forests
Irrawaddy dry forest
Kayah-Karen montane forests
Mizoram-Manipur-Kachin moist evergreen forests
Myanmar Coastal forests
Myanmar Coast mangrove forests
Northern Indochina subtropical forest
Northern Triangle subtropical forests- Myanmar
Northern Triangle temperatae forest
Tenaserim-S. Thailand semievergreen moist forests
Water
Country Boundary

1.3.3 Climate

The climate in Taninthayi Nature Reserve area is seasonal and tropical monsoon type. It may be described as wet and generally intermediate between that of the rest of the whole Myanmar and Malay Peninsula rather than upper Myanmar. Owing to the proximity of the sea, very high temperature are seldom experienced and cool wind blows throughout the most year. The rains usually start at the end of April and continue until about the middle of November and showers and slight storms are liable to occur at any time during December and March. The so-called cold weather is of very short duration confined to January only. Due to cool wind from sea, the nights however are cool almost throughout the dry season.

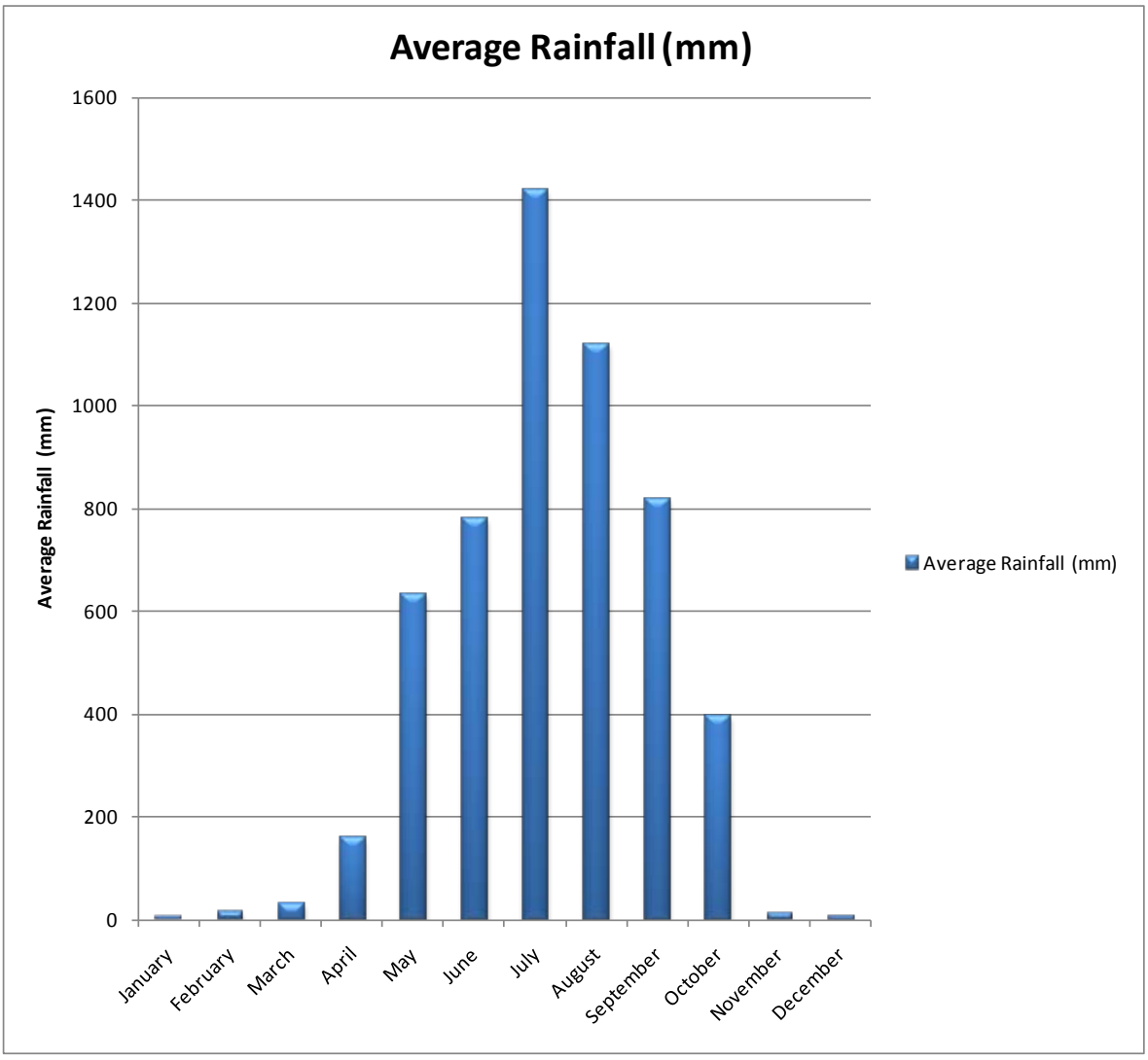
For the passed five years the average annual rain-fall was 234 inches with about 134 rainy days from January to December. Average Maximum temperature was 37.4ºC, the average minimum temperature was 13.63ºC and the mean temperature is 25.53ºC. It was notes as follow.

Rainfall in Gantgawtaung TNRP Station

Rainfall	**2006**		**2007**		**2008**		**2009**		**2010**	
Year	**Inches**	**Days**	**Inches**	**Days**	**Inches**	**Days**	**Inches**	**Days**	**Inches**	**Days**
Jaunary	0		0	0	0	0	0	0	1.016	2
February	1.45796	2	0	0	0	0	0	0	0	0
March	4.826	4	0.2032	1	2.16	3	0.9	3	0	0
April	15.748	9	1.653	3	6.732	10	9.788	13	0.46	1
May	33.7312	18	42.5156	24	45.68	22	12.16	19	13.952	14
June	53.22316	30	29.5404	14	49.724	28	45.08	28	18.6736	19
July	106.045	28	64.084	22	42.14	27	68.66	31	22.88	25
August	87.376	26	51.1704	29	45.86	23	31.74	19	51.66	26
September	19.431	15	28.648	21	40.568	23	44.18	22	16.676	18
October	0	0	25.244	10	6	6	13.02	16	9.54	13
November	0	0	0	0	4.1	5	0	0	0	0
December	0	0	0	0	0	0	0	0	2.06	2
Grand total	**321.8383**	**132**	**243.0586**	**124**	**242.964**	**147**	**225.528**	**151**	**136.9176**	**120**

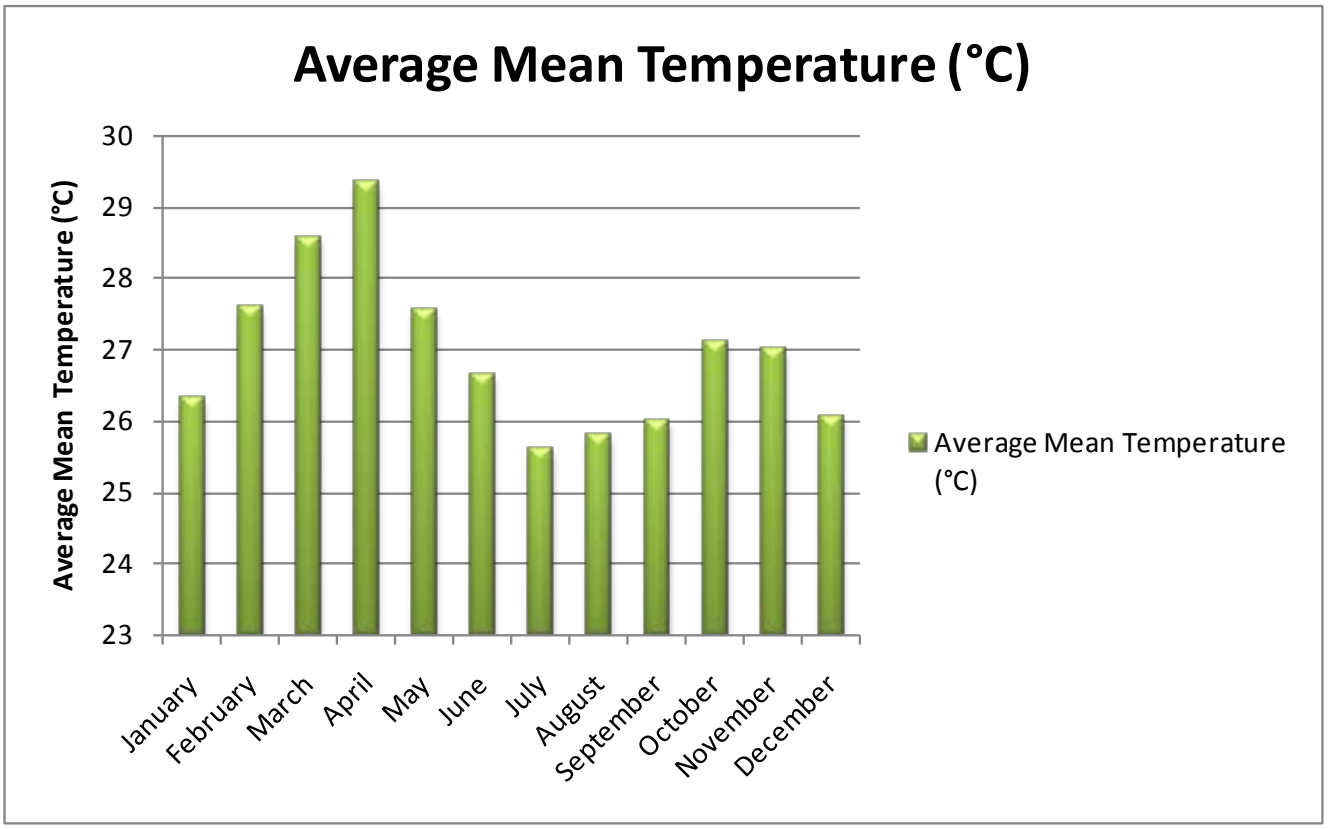
Average Rainfall (mm) 2006 to 2010 in study area

Month	2006	2007	2008	2009	2010	Average Rainfall (mm)
January	0	1	0	0	31	6.4
February	24	0	52	0	0	15.2
March	67	0	47	47	0	32.2
April	215	117	188	283	3	161.2
May	759	610	975	416	411	634.2
June	738	620	1026	1223	302	781.8
July	2081	1460	1038	1925	595	1419.8
August	1880	1228	766	903	832	1121.8
September	604	815	1149	1107	417	818.4
October	448	454	259	440	381	396.4
November	0	7	51	6	Trace	12.8
December	0	0	0	0	40	8



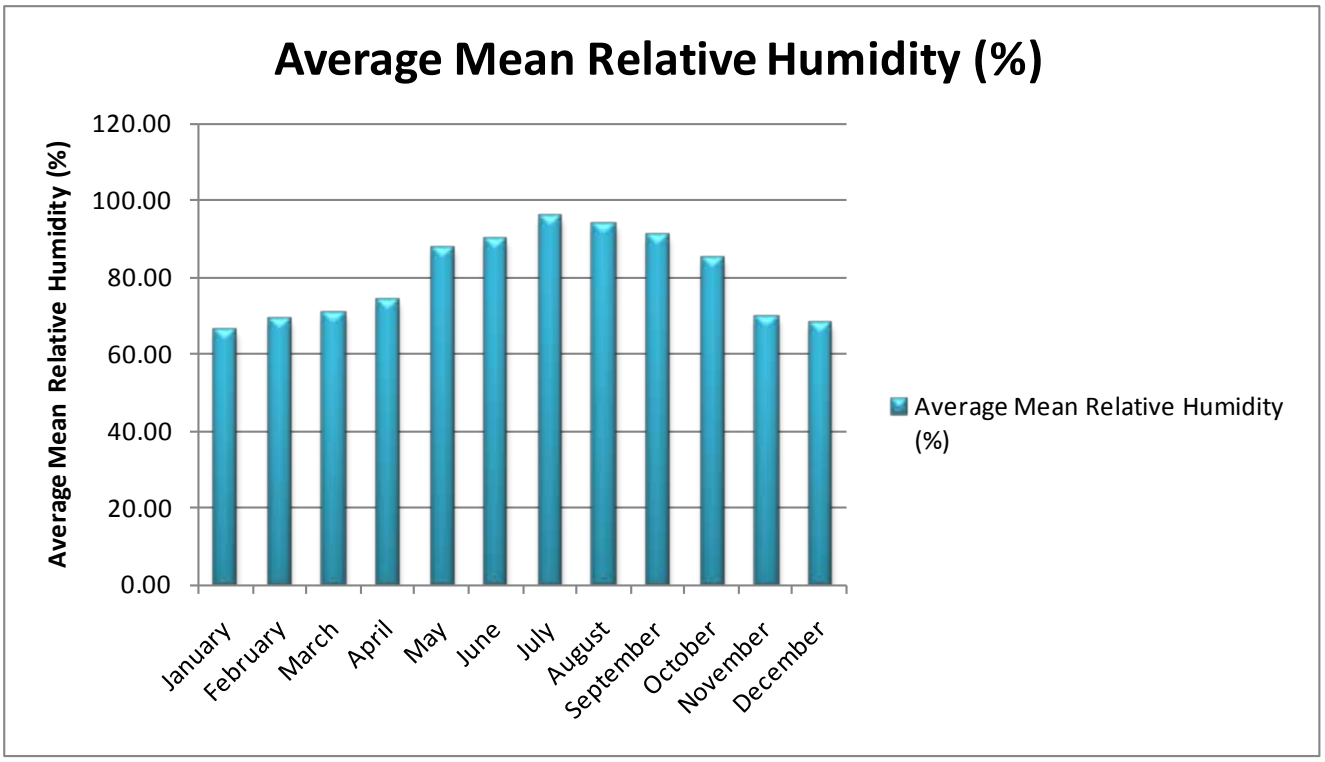
Average Mean Temperatrure (ºC) 2006 to 2010 in study area

Month	2006	2007	2008	2009	2010	Average Mean Temperature (°C)
January	26.4	26.7	26.4	24.6	27.5	26.32
February	28.2	26.5	27.5	27.7	28.1	27.6
March	29.2	27.9	27.9	29	28.8	28.56
April	28.8	29.6	29	28.8	30.5	29.34
May	27.7	27.4	25.8	27.2	29.7	27.56
June	26.4	27.3	26.1	25.5	28	26.66
July	25	25.6	25.5	24.7	27.3	25.62
August	24.8	25.3	26.2	26	26.8	25.82
September	26.5	25.8	25	25.3	27.4	26
October	27.5	27.3	27.8	26	27	27.12
November	28	26.2	26.7	27	27.2	27.02
December	26.2	26.2	24.9	26.4	26.6	26.06



Average Mean Relative Humidity (%) 2006 to 2010 in study area

Month	2006	2007	2008	2009	2010	Average Mean Relative Humidity (%)
January	68	64	65	60	75	66.4
February	67	62	71	72	73	69
March	73	65	71	73	71	70.6
April	73	72	77	78	69	73.8
May	88	90	94	89	78	87.8
June	90	81	93	98	88	90
July	100	95	96	98	90	95.8
August	98	96	91	91	92	93.6
September	91	94	93	93	85	91.2
October	85	81	84	89	86	85
November	70	66	69	71	71	69.4
December	65	67	63	70	75	68



1.3.4 Geology

The three geological formations are found in the area of Taninthayi Nature Reserve: (1) granite intrusions (2) the Mergui Series of Sedimentary rocks and (3) recent and sub recent alluvial deposits (H.C Smith-1926). The large masses of granite intruded into the oldest rocks which were the metamorphosed and folded sedimentary deposites. The sedimentary rocks had been eroded and exposed the granite elsewhere in the area. Frequently these sedimentary rocks cover the granite even on the hill tops but all the ranges of hills are of granite beneath.

The exposed granite masses are seen along the eastern boundary of the reserve near Thailand and Myanmar frontier. The hills, forming the watersheds of Zinba, Kin and Tavoy streams, are granitic. The axes of all granite intrusions are approximately north and south (Smith 1926). The granites contain abundant quartz, ortho and plagioclase feldspars and accessory minerals such as biolite, muscovite and little hornblencte (Smith 1926).

The granite is rapidly weathered and gives rise to gravelly soil on which giant evergreen forest is found, in which *Eugenia grandis* (Tha-bye-ni) was more plentiful than elsewhere (Smith 1926). It is light in colour, resembling coarse sand, and is easily distinguished from the soil to which the sedimentaries give rise. The weathering of granite leads to the splitting off large boulders such are commonly found in streams.

The Mergui Series are considerable depth and contain Carboniferous limestone. On weathering a brownish red clayey soil of great depth is formed. (Smith 1926). The weathering is greatly assisted by the accumulation of decaying vegetation and the extremely heavy rain.

WWF (2002) reported that much of this ecoregion consists of hills of Paleozoic lime-stone that have been dissected by chemical weathering. The overhanging cliffs, sinkholes and Caverns, characteristic of tropical karsts (area of limestone) landscapes are all present in this ecoregion. Large patches of limestone forest (drought-deciduous forest) are associated with the tropical karst. Due to these complex habitats which are little explored, it is likely that they contain inscribed endemic species (WWF).

Edaphic factors also affect vegetation. Forest on granite, with higher water-holding capacity, tend to support a higher proportion of evergreen broadleaf species, where as forest on the limestone are mostly drought-deciduous. Plants on lime stone have distinctive physiognomy with fleshy stems and small, sometimes ephemeral leaves (WWF).

1.3.5 Topography

The area of TNR is generally hilly along the Thai border area and most of the southern portions are mountainous. The mountain range runs from north to south while the slope rises from west to east towards the ridge top and is oriented to the western aspect. Most areas in TNR are of high elevation and the range of the terrain varies from 15m above sea level in low land to 1400m at the ridge of the border. The steep slope in most parts of the area is greater than 37%.

1.3.6 Vegetation

In 1926, H.C Smith reported that the vegetation of the nature reserve included seven different forest types namely Giant evergreen forest, Sub evergreen forest, Moist deciduous forest, Riverine forest, Dry deciduous forest, Hill evergreen forest and Tidal forest. The giant evergreen forest occupied all ground between elevations of 500 feet and 1000 feet. The sub evergreen forest and moist deciduous forest covered almost all ground below and elevation 500 feet. Riverine forest occupied along the narrow bank of the streams and Dry deciduous forest on the top of some of the low ridges and spurs on the bank of Tavoy River. Hill evergreen occupies on the tops of the ridges and spurs above the elevation of 2000 feet. Ka-ban (*Anisoptera costata*), Kaungmu (*Anisoptera* sp.), Ka-dut (*Dipterocarpus* sp.) were giant tree and occupied the canopy and Shitle(*Swintonia floribunda*), Che(*Melanorrhoea glabra*), Tha-bye-ni(*Eugenia grandis*), Thit-ka, Thit-sho, Thin-gan(*Hopea* sp.), Ta-gat(*Dysoxylum grande*), San-ga(*Michelia champaca*), Taung-bein(*Artocarpus calophylla*), Kanazo (*Baccaurea sapida*), Karawe(*Cinnamomum inunctum*) occupied the second storey. The smaller trees and evergreen shrubs occupied the understory. Bamboo may or may not be present. Mostly they occupied on very sleep slopes below 500 feet.

Sub evergreen forests were secondary forests developed on the abandoned taungyar also called Ponzo. This forest type was characterized by predominance of Thityauk (*Sapium insigne*), Lin-yaw (*Dillenia parviflora*), Karawe (*Cinnamomum inunctum*) and Ta-gat (*Dysoxylum grande*).

In moist deciduous forest, typical evergreen tree species were absent. Lin-yaw (*Dillenia* sp.), Ban-bwe (*Careya arborea*), Myauk-chaw (*Homalium tomentosum*), Pyin-ka-doe (*Xylia xylocarpa*) were majority and Thit-pyauk (*Schima noronhae*), Le-za-phyu (*Lagerstroemia calyculata*), Ka-ban (*Anisoptera costata*) were associated. Wabo (*Dendrocalamus brandisii*), Hmyin-wa (*Dendrocalamus membranceus*) and Wa-gok (*Oxytenanthera albo-ciliata)* also occurred in patches.

Riverine forest occurred as a narrow belt on flat ground along the banks of the larger streams. As soon as the ground started rising the rapidly change into evergreen forest. The principle species were Pyin-ma (*Lagerstroemia* sp.) and Thin-gan (*Hopea* sp.). The next common species are Tha-byu (*Dillenia* sp.), Ba-wa (*Garcinia* sp.) and Le-za-phyu (*Lagerstroemia* sp.). Tha-bye (*Eugenia claviflora*), Mani-aw-ga (*Carallia lacida*), and Anan (*Fagraea fragrans*) were also present.

This dry deciduous forest was very open and grassy. Bamboos are more often. Inbo (*Dipterocarpus obtusifolius*) was principle tree species on the top of the low ridges and spurs on lower slope. Bamboos were found more often. Entirely absence was scare in this area.

The Hill evergreen forest was found on the tops of the highest ridges and spurs above an elevation of 3000 feet. This type of forest was found near vicinity of Siamese frontier and Southern Parts of the reserve. The majority of tree species were Oaks (*Quercus* sp.).

This type of vegetation described by Smith (1926) was found to still exist even in the present time.

The type vegetation along the Yatana Gas Pipe-line route reported by Francis H.J.Crome (1995-1996), comprised eight types of native vegetation, Six types of resulting from the impact of shifting cultivation and Six types of agricultural/forestry activities. But the tree species composition concerning with the forest type were not mentioned. The types of forest are illustrated only by profile diagrams and photographs.

U Hla Maung Thein (2007) reported that Taninthayi Nature Reserve was almost covered by tropical rain forest distributed in high elevation of mountain side, but the forest is associated with deciduous hard wood and bamboo forest in the low land areas. The species composition was also generally mentioned. Evergreen canopy species were *Dipterocarpus* sp., *Hopea* sp., *Dysoxylum* sp. and *Swintonia* sp. and deciduous species were *Parkia* sp., *Tetramele* sp. understory species were *Polyalthia* sp., *Schima* sp., *Cinnamomum* sp. and shrubs and herbs and calamus and bamboo.

According to Terrestrial Ecoregions of the Indo-pacific (WWF-2002) Taninthayi Nature Reserve lies within the Ecoregion number (53) namely, Tenasserim-South Thailand Semi-Evergreen Rain Forest. This ecoregion encompasses the mountainous, semi-evergreen rain forest of the southern portion of the Tenasserium Range, which separates Thailand and Myanmar. Annual precipitation increases southward and receives rain from both northeast monsoons. The vegetation includes both lowland and montane forests. The tropical hardwood trees in the family Dipterocarpaceae dominate in this Ecoregion, but species turn over with both elevation and latitude. The dipterocarp forests include *Dipterocarpus* sp., *Shorea* sp. also and *Hopea* sp. mixed with *Dillenia* sp., hundreds of orchid species, *Drynaria* ferns, rattans and bamboos. The diverse habitats within this ecoregion form deciduous forest in north and evergreen forest in the south. It is also one of the richest bird species in Indo-Pacific region. Forests of this ecoregion support innumerable plant species that have distinctive and fascinating life histories. The insectivorous pitcher plants Nepenthes grow in high elevation bogs and other nitrogen-deficient habitats. Forest of this ecoregion also supports *Rafflesia*, a curious root parasite specific to vines of the genus *Tetrastigma*. (WWF)

Present study confirms that the type of vegetation in TNR includes Evergreen forest, Deciduous forest and Riverine forest. Hill Evergreen Forest, distributed in high elevation of the mountain up to 1000 ft to 2000 ft., near Kalone-tar and Hnan-kyee. The dominant tree species are *Castanopsis* sp. (Wet-thit-cha), *Lithocaropus* sp. (Oaks). The Giant Evergreen Forests are distributing in the elevation of 1000ft near Ye-bone, Kalone-tar, Hnan-kyee and junction of Ok-tha-yan. The canopy layer is occupied by *Anisoptera* spp. (Kaung-mu, Ka-ban), *Shorea* spp. (Ka-dut) and *Dipterocarpus* spp.(Ka-nyin).

The second story consists of *Swintonia floribunda* (Shitle), *Melanorrhoea glabra* (Thit-si), *Eugenia oblata* (Tha-bye-ni), *Pentace burmanica* (Thit-kha), *Pentace griffithii* (Thit-sho), *Hopea sangal* (Thingan-makalay), *Amoora wallichii* (Gat-ni), *Dysoxylum grande* (Tagat-ni-ywet-gyi), *Michelia champaca* (San-ga), *artocarpus champaca* (Taung-peinne),

Baccaurea sapida (Kanazo/Bon-mapa), *Cinnamomum multiflorum* (Kara-phwe), *Syzygium buxifolium* (Thabye-htat-ta-ya) and *Nauclea sessilifolia*(Thit-pa-yaung).

The understory was occupied by small trees such as *Alstonia rastrata* (Myet-na-pan-po), *Gonocaryum griffithianum* (Wun-tha-gye) and *Measa* spp. (Nwar-pin), evergreen shrubs and herbs like, *Leea* spp., *Cinnamomum* spp., *Colocasia* spp., *Costus* spp., *Alpinia* spp., *Amomum* spp., *Phrynium* spp. and *Stachyphrynium* spp.

Bamboos like, *Neohouzeaua tavoyan* (Dawe-wa), *Dendrocalamus brandisii* (Wa-bo), *Gigantochloa nigrociliata* (Nat-wa) and palm like *Licula peltata* (Sa-lu) are found mixed in patches.

Secondary sub-evergreen forests were found distributing in low lands and on the ridge and slopes of Ka-lone-tar and Hnan-kyee area. The dominant species are *Dillenia parviflora* (Zin-byun), *Cinnamomum multiflorum* (Ka-ra-phwe), *Dysoxylum grande* (Tagat-ni-ywet-gyi), *Cratoxylum polyanthum* (Mat-pe-phyu), *Cratoxylum neriifolium* (Mat-pe-ni), *Schima wallichii* (Thit-ya), *Aporusa* spp.(Thit-khauk) and *Sapium insigne* (Thit-pyauk). Some palms like, *Salacca wallichiana* are found mixed with small trees of *Lagerstroemia* spp. and *Hopea* spp. in the secondary sub-evergreen forest.

The deciduous forests are found to be distributing in low land areas. The dominant species in Moist Deciduous forest are *Dillenia parviflora* (Zin-byun), *Careya arborea* (Ban-bwe), *Homalium tomentosum* (Myauk-chaw), *Xylia xylocarpa* (Pyin-ka-doe), *Schima wallichii* (Thit-ya), *Lagerstroemia tomentosa* (Le-za). In dry deciduous forest *Dipterocarpus tuberculatus* (In) and *Dipterocarpus obtusifolius* (Ka-nyin) are found to be dominant tree species and bamboos especially *Dendrocalamus membranceus* (Hmyin-wa) are found often occupying larger area.

The Riverine Forests are found distributing along the bank of Zimba stream, Heinze stream, Kin stream and Ka-lone-tar stream. Bamboo forests are found near the bank of the stream and service track. Most of the Riverine forests are secondary forest mixed with bamboo forests. The dominant tree species are *Lagerstroemia floribunda* (Pyin-ma-phyu), *Hopea odorata* (Thin-gan), *Dillenia indica* (Tha-byu), *Garcinia speciosa* (Ba-wa), *Lagerstroemia tomentosa* (Le-za), *Schima wallichii* (Thit-ya), *Syzygium clariflorum* (Tha-bye), *Carallia brachiata* (Yat-pin), *Albizia lebbek* (Kokko), *Vatica dyeri* (Kanyin-kyaung-che *Dysoxylum grande* (Tagat-ni-ywet-gyi), *Cinnamomum multiflorum* (Ka-ra-phwe), *Pentace griffithii* (Thit-sho), *Salix tetrasperma* (Mo-ma-ka), *Syzygium gratum* (Thabye-pauk-pauk), *Podocarpus neriifolius* (Thit-min-pho) and *Chisocheton paniculatus* (Gat-phyu). The dominant bamboo species are *Bambusa affinis* (wa-net, Waya), *Bambusa binghami* (Kya-khat-wa), *Bambusa laxa* (Wa-byauk), *Bambusa multiplex* (Waphyu-gale), *Dendrocalamus giganteus* (Hmyin-wa, Wa-phyu), *Dendrocalamus longispathus* (Wa-payaung, Wa-bo), *Cephalostachyum virgatum* (Wabo-gyi) and *Gigantochloa hasskarliana* (Ta-bin-daing-wa).

It is clearly confirmed that the vegetation and composition of tree species in the TNR still exists as described by Smith (1926), 85 years ago. However the land cover and land use

have been changed over time. The population of each species concerned also decline due to logging, both legal and illegal.

1.3.7 Land use and Land cover of TNR

The land use and land cover classes of Taninthayi Nature Reserve ("Taninthayi Nature Reserve Operational Management Plan") was shown in the following table.

Table: Land use/ Land cover of TNR (2006)

No.	Land use class	Acre	Hectare	%
1.	Evergreen closed	256942	103983	61.17
2.	Evergreen open	70241	28426	16.72
3.	Scrub land	50994	20637	12.14
4.	Bamboo	33156	13418	7.89
5.	Grass land	4690	1898	1.12
6.	Agri/horticulture land	3034	1228	0.72
7.	Sand	27	11	0.01
8.	Water body	986	399	0.23
	Total	**420,070**	**170,000**	**100.00**

It is clear that Evergreen forest (Both Hill Evergreen and Giant Evergreen) is occupying 77% of overall coverage of TNR.

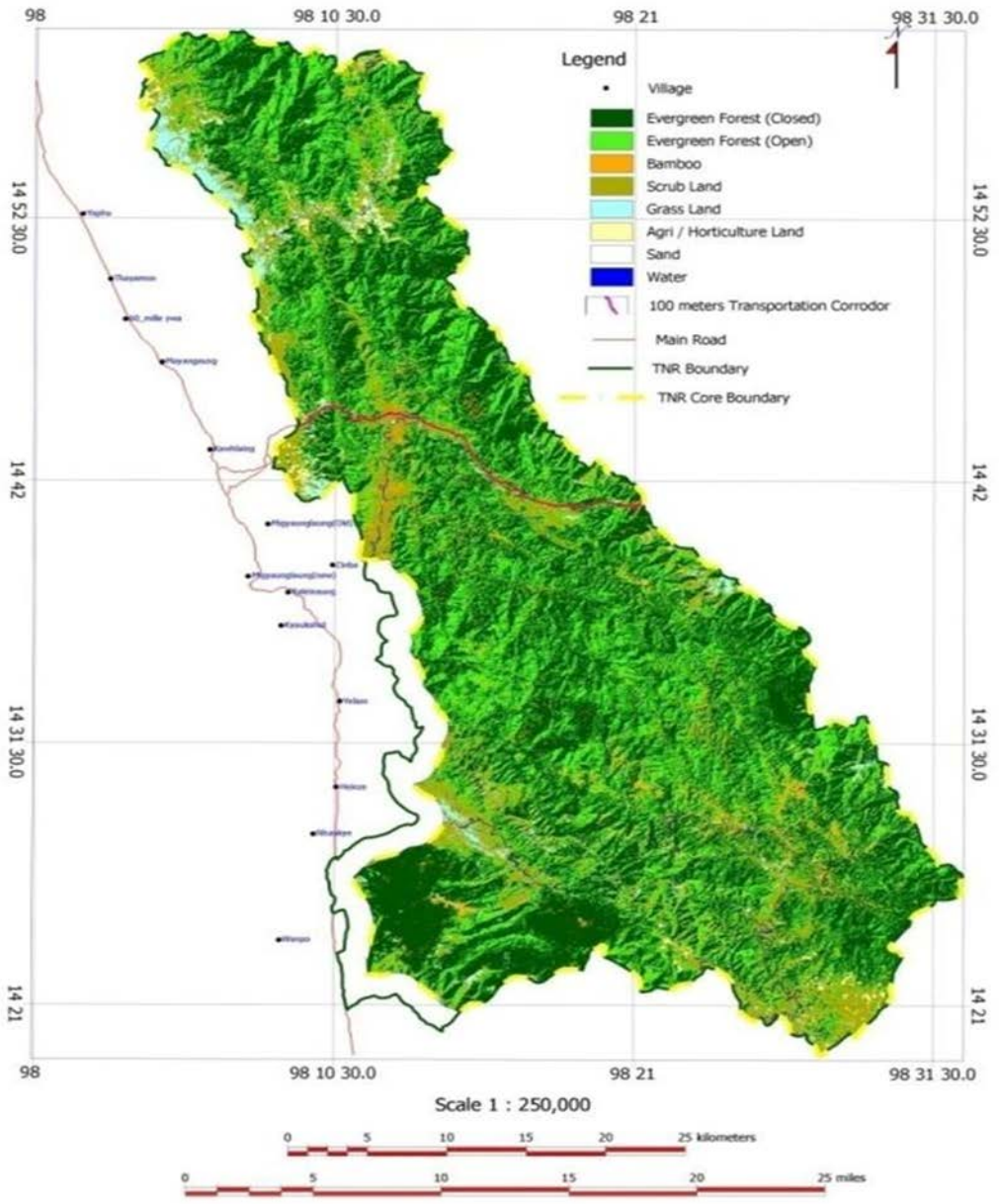
However land cover changes have been taking place due to annual deforestation rate during 1990 and 2006. Land cover changes by land use types were shown by the following table in "Taninthayi Nature Reserve Operational Management Plan".

Land use type	TNR Area Only(ha)			10km Buffer Only (ha)		
	1990	2000	2006	1990	2000	2006
Evergreen (closed)	126271	110047	103983	26000	22701	19582
Evergreen (open)	25059	26634	28426	28129	26758	24653
Total forest cover	**151330 (89.01%)**	**136681 (80.40%)**	**132409 (77.89%)**	**54129**	**49459 (31.86%)**	**44235 (28.55%)**
Scrub land	11068	22054	20637	66688	69746	70819
Bamboo	5124	8276	13418	4608	4377	4594
Grass land	1127	1633	1898	16301	16426	21080
Total degraded cover	**17319**	**31963 (18.80%)**	**35983**	**87597**	**90549**	**96493 (62.18%)**
(Agri/horticulture land	1012	1127	1228	12189	13922	13635
Total Agri / horticulture cover	**1012 (0.59%)**	**1127**	**1228 (0.72%)**	**12189 (7.85%)**	**13922**	**136.35 (8.79%)**
Sand	0	13	11	2	105	42
Water	339	216	<	1278	1160	790
Others	**339**	**220 (0.13%)**	**410 (0.24)**	**1280 (0.82%)**	**1265 (0.82%)**	**832**
Total	**170000**	**170000**	**170000**	**155195**	**155195**	**155195**
Total forest cover (EGC+ EGO)	151330	136681	132409	54129	49459	44235
Annual deforestation rate (ha)		**-1465**	**-712**		**-467**	**-871**

(Assessments made on Landsat 5 TM scenes of 1990, 2000 and 2006: RS/GIS section: 2009)

It is clear that the land cover changes were due to human impact inside the TNR area. Due to deforestation the Bamboo forest areas are expanding in the TNR area particularly near the large stream like Zimba and Kin stream and inside 10 kilometer buffer zone. (Map)

Land Use & Land Cover Status of Core Zone of TNR Area (2006)



2. OBJECTIVES

2.1 Goal

The main objective of present survey is to record and identify the tree species and Bamboo species growing wild in the Taninthayi Nature Reserve and to collect and store as a herbarium specimens of each species.

2.2 The Management Objectives

- To record the correct scientific names of the species concerned.
- To find out the endemic or nearly endemic species in the area.
- To record the essential ecological data in the area.
- To find out the endangered species in the area.
- To suggest the implementation of conservation activities in the area.

3. MATERIALS AND METHODS

3.1 Method

At present time, a complete assessment of the flora of the whole area of TNR is impossible due to the limitation of security and duration of survey season. Therefore random collection by transects and sample plot collection were carried out. The study sites were set up along the service tract at the northern boundary, Kalone-tar area at the southern boundary, Yae-bon, Heinze and Kyauk-shat area at the western boundary and Myanmar/ Thai Border near Gas metering station on 1500 feet mountain at eastern boundary. Due to security reason, only 10% to 20% of the area was accessible.

The plant collection was conducted by following methods.

3.1.1 Sample Ploting

The Global Positioning System was used to navigate and mark coordinates of the sample plots. In order to obtain essential data for predicting tree species composition in the forest and vegetation types, 20x20, 25x25 and 30x30 meter quadrant, were set up and tree species in the plot were collected and population of each species were also counted. For the Bamboo survey, 30x30 meter quadrants were set up and bamboo species were collected and number of clump of each species were also counted. The species identification was carried out by using key to families of flowering plants and appropriate literature and confirmed by matching with herbarium specimens of Department of Botany, University of Yangon.

3.1.2 Random Transecting

To get representative checklists of the tree species and bamboo species, plant collection was also carried out by random transect lines along the road side and between one plot and another whenever possible. Specimen collection was made within 10 meter on either side of the transect line.

3.2 Materials

Materials used for recording are strings for sample plotting and transecting, digital camera for recording, GPS, maps, heavy duty plastic bags, newspapers, alcohol, spray jug (for fixing specimens), 10x lens, permanent marker, field note books, field press, drying press and dryers.

3.3 Data Analysis

After field survey, data entry was carried out in Excel work sheet. Analysis of population per hectare percentage was conducted using excel work 2007.

3.3.1 Population of Individual Species (per hectare)

The population of species will show not only the composition of species but also the richness of the species in the study area. According to R.He'dl, M Sva'tek, M. Dancak, Rodzay A.W., M. Salleh A.B., Kamariah A.S.(2009), population of individual species (per hectare) is determined by following formula.

$$\text{Population of Individual Species} = \frac{\text{Total individual species}}{\text{Total Plots Area } (m^2)} \times 10000 m^2 (1ha)$$

3.3.2 Relative Density of Tree species

The density of a species refers to the numerical representation of its individual and the availability of space in a unit area. The density index shows not only the richness of the texa but also the relative distribution of the individuals. According to Curtis (1959), the density index is determined by the following formula.

$$\text{Relative Density of Tree species} = \frac{\text{No. of Individual species}}{\text{Total no. of all individual Species}} \times 100$$

3.3.3 Relative frequency of Tree species

The relative frequency of a species refers to the percentage occurrence of its individuals and shows the frequency of different species growing in the study area. The species which fall in high frequency class can be considered as the most common species in the study area. According to Curtis (1959), the relative frequency is determined by the following formula.

$$\text{Relative frequency of Tree species} = \frac{\text{No. of sample plot occurs}}{\text{Total no. of all species occur}} \times 100$$

3.3.4 Species distribution by frequency class

According to Raunkiaer's Law of frequency (1934), each species was grouped into one of five frequency class (FC); Frequency range (1-20%) represents rare species, (20 - 40%) represents seldom species, (40 - 60%) represents often species, (60 - 80%) represents mostly species, and (80 - 100%) represents constantly present species. This frequency class will also clarify the homogeneity or heterogeneity of the floristic distribution in the study area.

3.4 Participants

(1) U Nyo Maung (Retired Professor), Taxonomist

(2) Dr. Win Myint (Associated Professor), Ecologist

(3) Dr. Ei Ei Phyoe Taxonomist

(4) Dr. Lwin Mar Saing Taxonomist

(5) Foresters of TNR

3.5 Daily Schedule

Daily Schedule for first Trip

Date	Activities	G.P.S
12.11.2010	Yangon to Kanbauk	
13.11.2010	Along The Phaw san Stream near 49 Kilometer	N 14° 44' 38.3" E 098° 11' 08.8"
14.11.2010	Along The Kyauklongyi Stream Near Kyauk longyi Outpost	N 14° 41' 26.8" E 098° 17' 42.0" N 14° 41' 32.1" E 098° 17' 15.4"
15.11.2010	Near Zinbar Stream	N 14° 40' 32.1" E 098° 20' 06.7"
16.11.2010	Near Phaw san Stream Near Thaung thar ku Stream	N 14° 44' 44.8" E 098° 11' 10.2" N 14° 42' 23.5" E 098° 16' 12.4"
17.11.2010	At the foot of .Phaw san Hill	N 14° 44' 15.1" E 098° 11' 51.9"
18.11.2010	**Meeting (Gangawtaung Camp)**	
19.11.2010	At the end of Mainmapan Stream	N 14° 38' 04.2" E 098° 12' 48.1"
20.11.2010	At the top of Kya kon taung	N 14° 39' 59.5" E 098° 19'

		26.1"
21.11.2010	Data Entry	
22.11.2010	Yebon to Kyauk Wee Stream	N 14˚ 33' 03.8" E 098˚ 11' 09.5" N 14˚ 33' 20. 3"E 098˚ 13' 46.3"
23.11.2010	Yebon to Yan sat Stream	N 14˚ 33' 03.8" E 098˚ 11' 09.5" N 14˚ 31' 57.2" E 098˚ 14' 05.4"
24.11.2010	Data Entry	
25.11.2010	Data Entry	
26.11.2010	Kanbauk to Yangon	

Daily Schedule for second Trip

Date	Locations &Activities	G.P.S
20.12.2010	Yangon to Kanbauk, Kanbauk to Yebone Camp	
21.12.2010	Along Sepin Taung range and Byetgathan Chang Between Sepin taung and Byetgathan Yetagon Range	N 14˚ 32' 49.4" E 098˚ 14' 42.4" N 14˚ 32' 40.9" E 098˚ 14' 32.1"
22-12-2010	Data entry	Yebone Camp
23-12-2010	Data entry	Yebone Camp
24-12-2010	Data entry	Yebone Camp
25-12-2010	Camp move to Kalontar Aishae	N 14˚ 19' 01.0" E 098˚ 15' 29.1"
26-12-2010	Thitone pate hill top Thitone pate Mountain Range	N 14˚ 21' 33.1" E 098˚ 14' 16.8" N 14˚ 21' 54.5" E 098˚ 14' 09.3"
27-12-2010	Near Nut Hine Stream Yepu Mountain Range Yepu Mountain Range	N 14˚ 20' 06.7" E 098˚ 15' 04.9" N 14˚ 21' 26.7" E 098˚ 14' 69.5" N 14˚ 21' 46.1" E 098˚ 14' 61.7"

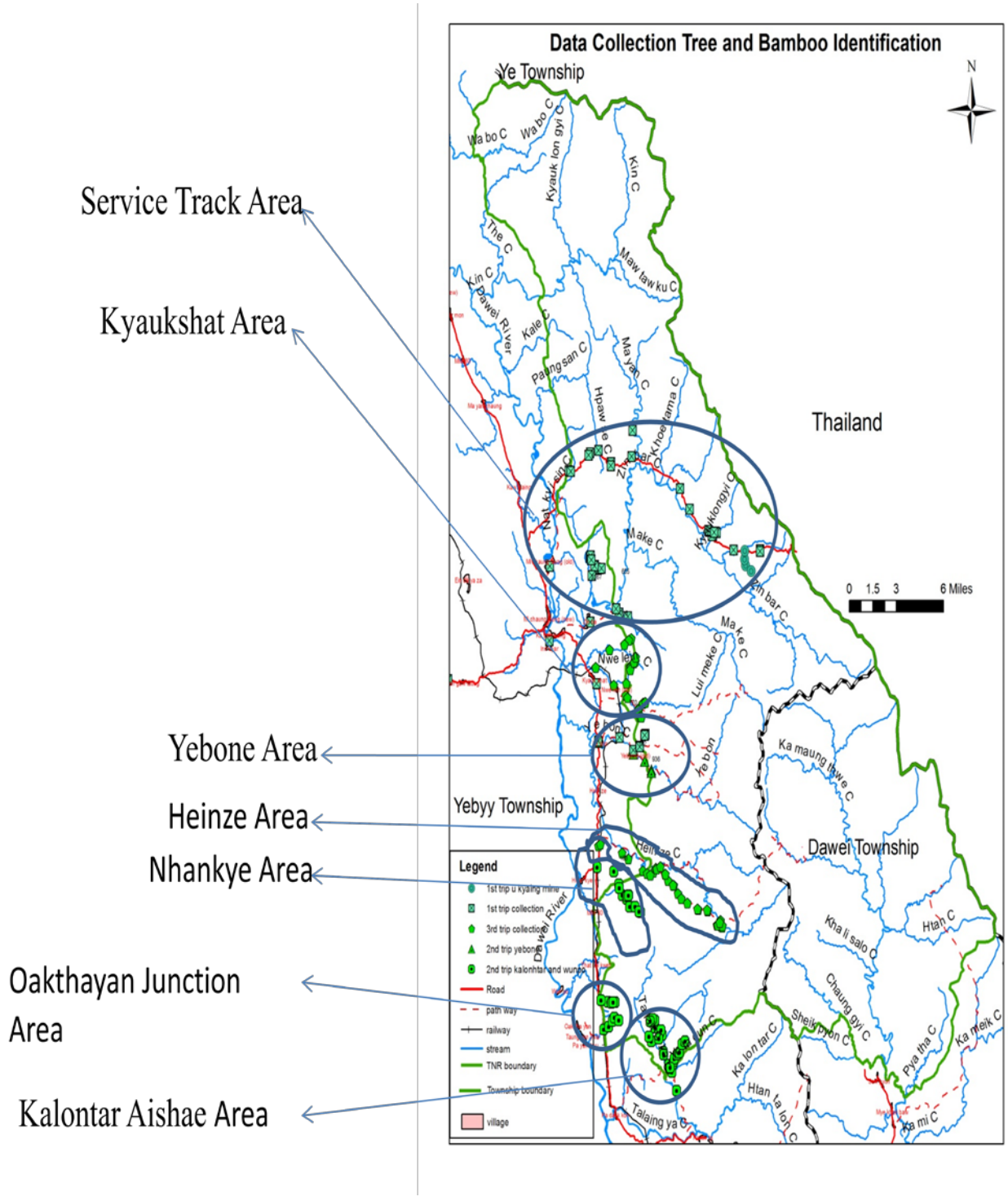
28-12-2010	Yetagon Mountain Range & Kyaukphyu Track Yangon Pyan Mountain Range Between Nut Hine Stream & Yetagon Stream	N 14˚ 20' 47.2" E 098˚ 15' 50.6" N 14˚ 20' 90.3" E 098˚ 15' 78.7" N 14˚ 19' 95.3" E 098˚ 15' 13.3"
29-12-2010	Camp move to Oakthayan Junction	N 14˚ 21' 29.0" E 098˚ 11' 27.4"
30-12-2010	Ye bya Mountain Range, Near Kyuk kyum Stream	N 14˚ 22' 35.1" E 098˚ 11' 40.5" N 14˚ 22' 34.5" E 098˚ 11' 58.0"
31-12-2010	Taung pyin gone mountain top & Kyezepin Pyar	N 14˚ 21' 50.9" E 098˚ 12' 17.3"
1-1-2011	Camp move to Nhankye Nhankye to Phonegyi Khante	N 14˚ 27' 59.8" E 098˚ 11' 04.6“ N 14˚ 26' 53.0" E 098˚ 12' 28.5"
2-1-2011	Near Phutmatet Mountain Near Shweoomine Near Shweoomine Stream Near Luwine Stream Three Tributaries	N 14˚ 26' 44.1" E 098˚ 12' 43.7“ N 14˚ 26' 24.7" E 098˚ 12' 53.3“ N 14˚ 26' 24.5" E 098˚ 13 11.0" N 14˚ 26' 13.7" E 098˚ 13' 24.3"
3-1-2011	Between Luwine Mountain Range and Phutmatet Mountain Range Eastern side of Phutmatet Mountain Near Phonegyi Khante Boundary	N 14˚ 26' 52.6" E 098˚ 12' 49.8“ N 14˚ 26' 52.0" E 098˚ 12' 49.3“ N 14˚ 27' 10.2" E 098˚ 12' 19.0“
4-1-2011	Camp move Nhankye to Gangawtaung Camp	
5-1-2011	Backed to Yangon, arrived back 1:00 noon	

Daily Schedule for Third Trip

Date	Locations &Activities	G.P.S
18.2.2011	Yangon to Kanbauk, Kanbauk to Kyaukshat Camp	

19.2.2011	Near Kamyauk Stream Near Yepu Stream	N 14˚ 34' 62.9" E 098˚ 13' 76.6" N 14˚ 34' 03.7" E 098˚ 13' 53.4"
20-2-2011	Mountain ranges near upstream of Newlain Stream Near Bhothutaw Boad Pile, On the range between New lein stream and Kyaukshat stream Between Kyaukshat and Mainmapain Streams	N 14˚ 35' 94.3" E 098˚ 12' 92.7" N 14˚ 36' 23.4" E 098˚ 13' 14.1" N 14˚ 36' 44.0" E 098˚ 13' 13.4"
21-2-2011	Camp move from Kyaukshat to Yodaya track	
22-2-2011	Near junction of Heinze and Pharkya Streams	N 14˚ 25' 78.4" E 098˚ 17' 87.8"
23-2-2011	The mountain range near Tadarkyo Stream Eastern side of Ponnalo Stream Eastern side of Ponnalo Stream Between Byinpepin and Ponnalo streams Near Kyaukkyan Stream	N 14˚ 26' 29.1" E 098˚ 17' 18.0" N 14˚ 26' 30.5" E 098˚ 16' 68.7" N 14˚ 26' 33.1" E 098˚ 16' 65.5" N 14˚ 26' 56.8" E 098˚ 16' 09.7" N 14˚ 27' 29.2" E 098˚ 15' 30.0"
24-2-2011	Near Kyaukkyan Stream Up Heinze Stream, near Byanmyepin Boad Pile Near upstream of Nyaungyoe	N 14˚ 27' 72.3" E 098˚ 14' 86.9" N 14˚ 28' 02.3" E 098˚ 14' 60.0" N 14˚ 27' 68.3" E 098˚ 14' 04.4"

25-2-2011	Camp move from Kyaukshat to Gangaw taung camp	
26-2-2011	Data entry	
27-2-2011	Service track	
28-2-2011	Move back to Yangon	


Service Track Area
Kyaukshat Area
Yebone Area
Heinze Area
Nhankye Area
Oakthayan Junction Area
Kalontar Aishae Area
Data Collection Tree and Bamboo Identification
Ye Township
Thailand
Yebyy Township
Dawei Township
Legend
1st trip u kyaing mine
1st trip collection
3rd trip collection
2nd trip yebone
2nd trip kalonhtar and wunpa
Road
path way
railway
stream
TNR boundary
Township boundary
village
0 1.5 3 6 Miles
N

4. RESULT

4.1 Service Track Area

Primary Forest

Secondary Forest

Bamboo Forest

Tree Fern (Rare Species)

4.1.1 Floristic composition

The total number of tree species collected in 9 representative sample plots in this area is 61species belonging to 52 genera. The bamboo species collected in 6 representative sample plots are 16 species belonging to 8 genera.The dominant bamboo species are *Bambusa heterostachya* (Muna.) Holttum and *Racemobambos congesta* (Pilger) Holttum.The dominant tree species in this area is *Chukrasia tabularis* A. Juss (Yin-ma) followed by *Orophea sp. and Dipterocarpus obtusifolius* Teysm. *Cyathea gigantean* (Tree fern), the rare species was found on the bank of the stream near Kyauk-lone-gyi camp.

4.1.2 Tree Species Population

No.	Scientific Name	No. of individual	Total no. of individual/ha	Total no. of population/ha (%)
1	*Agalaia* sp. (1)	21	53	5.817174515
2	Anacardiaceae	1	3	0.27700831
3	*Anisoptera scaphula (Roxb.)* Pierre	3	8	0.831024931
4	*Areca triandra* Roxb.	2	5	0.55401662
5	*Artocarpus chaplasha* Roxb.	2	5	0.55401662
6	*Baccaurea sapida* Muell.Arg.	6	15	1.662049861
7	*Barringtonia cymosa* Fischer	16	40	4.432132964
8	*Bouea burmanica* Griff	2	5	0.55401662
9	*Callerya atropurpurea* (Wall.) Schot.	3	8	0.831024931
10	*Capparaceae*	1	3	0.27700831
11	*Carallia brachiata* (Lour.)Merr.	1	3	0.27700831
12	*Caryota mitis* Lour.	2	5	0.55401662
13	*Chisocheton paniculatus Hcern.*	1	3	0.27700831
14	*Chukrasia tabularis* A.Juss.	60	150	16.62049861
15	*Cinnamomum pachyphyllum* Kosterm.	1	3	0.27700831
16	*Cinnamomum* sp. (1)	2	5	0.55401662
17	*Dillenia parviflora* Griff	3	8	0.831024931
18	*Dipterocarpus alatus* Roxb.	1	3	0.27700831
19	*Dipterocarpus grandiflorus* Blanco	1	3	0.27700831
20	*Dipterocarpus obtusifolius* Teysm.	26	65	7.202216066
21	*Dipterocarpus* sp.	4	10	1.108033241
22	*Dipterocarpus turbinatus* Gaertn.f.	12	30	3.324099723
23	*Emblica officinalis* Gaertn.	1	3	0.27700831
24	*Eugenia oblata* Roxb.	2	5	0.55401662

25	*Ficus* sp. (1)	1	3	0.27700831
26	*Garcinia heterandra* Wall.	1	3	0.27700831
27	*Gelonium multiflorum* A.Juss	1	3	0.27700831
28	*Gluta usitata*	13	33	3.601108033
29	*Heterophragma adenophylla* (Wall.) Seem. ex Benth. & Hook.	1	3	0.27700831
30	*Hopea sangal* Korth.	2	5	0.55401662
31	*Lagerstroemia floribunda* Jack	1	3	0.27700831
32	*Lagerstroemia macrocarpa* Kurz	2	5	0.55401662
33	*Laportea crenulata* Gaud.	2	5	0.55401662
34	*Lithocarpus* sp. (1)	10	25	2.770083102
35	*Litsea glutinosa* (Lour.)C.B.Robins.	5	13	1.385041551
36	*Litsea* sp.(1)	1	3	0.27700831
37	*Mangifera caloneura* Kurz	1	3	0.27700831
38	*Mesua nervosa* L.	5	13	1.385041551
39	*Microcos paniculata* L.	2	5	0.55401662
40	*Myristica angustifolia* Roxb.	3	8	0.831024931
41	*Orophea* sp.	50	125	13.85041551
42	*Pandanus foetidus* Roxb.	1	3	0.27700831
43	*Pavetta indica* L.	22	55	6.094182825
44	*Payena oleifera* Watt.	1	3	0.27700831
45	*Payena paralleloneura* Kurz	8	20	2.216066482
46	*Pentace griffithii* King	4	10	1.108033241
47	*Phoebe tavoyana* (Meissner) Hook.F.	3	8	0.831024931
48	*Pterospermum semisagittatum* Buch-Ham	9	23	2.493074792
49	*Quercus* sp.(1)	2	5	0.55401662
50	*Rinorea* sp.	1	3	0.27700831

51	Rubiaceae	1	3	0.27700831
52	*Shorea cinerea* Fischer	11	28	3.047091413
53	*Shorea* sp.	3	8	0.831024931
54	*Spondias pinnata* (L.)Kurz.	1	3	0.27700831
55	*Stereospermum colais* (Buch.-Ham. Ex Dillwyn) Mabb.	2	5	0.55401662
56	*Swintonia floribunda* Griff.	8	20	2.216066482
57	*Symplocos* sp. (1)	2	5	0.55401662
58	*Talipariti macrophyllum* (Roxb. ex Hornem.) Fryxell	1	3	0.27700831
59	*Tetramelea nudiflora* R.Br.	1	3	0.27700831
60	*Trevesia palmata* (Roxb. Ex Lind.) Vis	4	10	1.108033241
61	*Xerospermum noronhianum* Blume	1	3	0.27700831
	Total	**361**	**903**	**100**

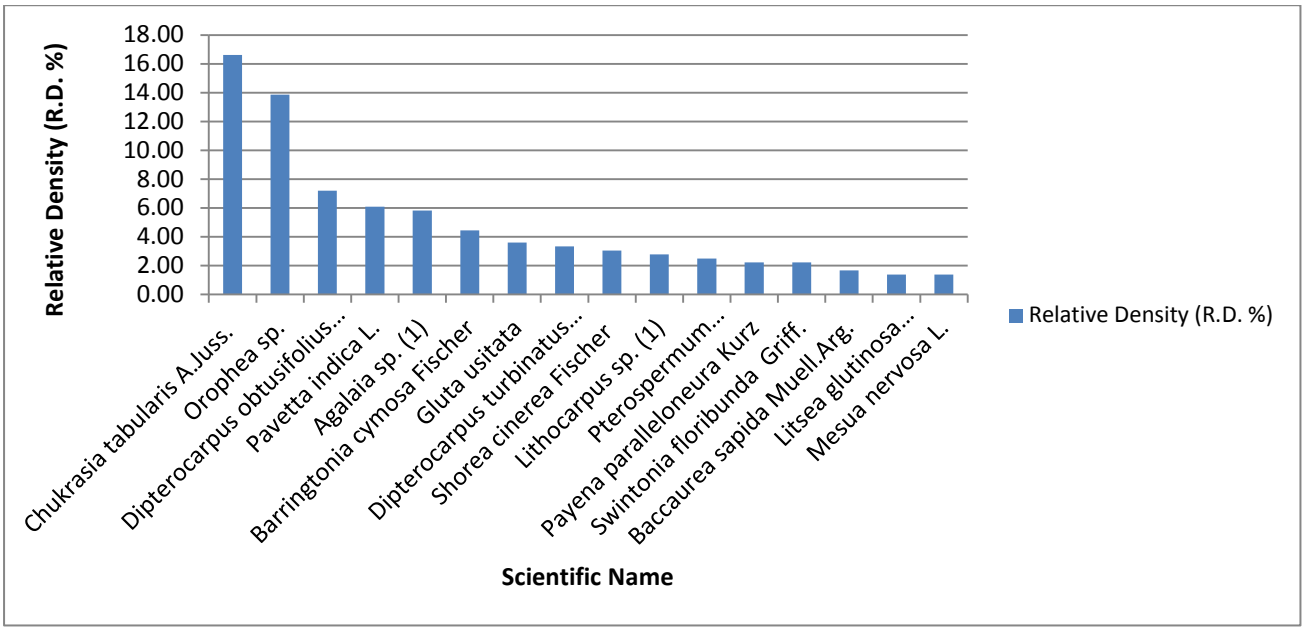
4.1.3 Relative density

Among the sample plots species density per hectare varied and the highest density was observed *Chukrasia tabularis* followed by *Orophea* sp. This shows that these two species are abundant in this area.

No.	**Scientific name**	**Density (D)**	**Relative Density (R.D. %)**
1	*Chukrasia tabularis* A.Juss.	6.666666667	16.62049861
2	*Orophea* sp.	5.555555556	13.85041551
3	*Dipterocarpus obtusifolius* Teysm.	2.888888889	7.202216066
4	*Pavetta indica* L.	2.444444444	6.094182825
5	*Agalaia* sp. (1)	2.333333333	5.817174515
6	*Barringtonia cymosa* Fischer	1.777777778	4.432132964
7	*Gluta usitata*	1.444444444	3.601108033
8	*Dipterocarpus turbinatus* Gaertn.f.	1.333333333	3.324099723
9	*Shorea cinerea* Fischer	1.222222222	3.047091413
10	*Lithocarpus* sp. (1)	1.111111111	2.770083102
11	*Pterospermum semisagittatum* Buch-Ham	1	2.493074792
12	*Payena paralleloneura* Kurz	0.888888889	2.216066482
13	*Swintonia floribunda* Griff.	0.888888889	2.216066482

14	*Baccaurea sapida* Muell.Arg.	0.666666667	1.662049861
15	*Litsea glutinosa* (Lour.)C.B.Robins.	0.555555556	1.385041551
16	*Mesua nervosa* L.	0.555555556	1.385041551
17	*Dipterocarpus* sp.	0.444444444	1.108033241
18	*Pentace griffithii* King	0.444444444	1.108033241
19	*Trevesia palmata* (Roxb. Ex Lind.) Vis	0.444444444	1.108033241
20	*Anisoptera scaphula (Roxb.)* Pierre	0.333333333	0.831024931
21	*Callerya atropurpurea* (Wall.) Schot.	0.333333333	0.831024931
22	*Dillenia parviflora* Griff	0.333333333	0.831024931
23	*Myristica angustifolia* Roxb.	0.333333333	0.831024931
24	*Phoebe tavoyana* (Meissner) Hook.F.	0.333333333	0.831024931
25	*Shorea* sp.	0.333333333	0.831024931
26	*Areca triandra* Roxb.	0.222222222	0.55401662
27	*Artocarpus chaplasha* Roxb.	0.222222222	0.55401662
28	*Bouea burmanica* Griff	0.222222222	0.55401662
29	*Caryota mitis* Lour.	0.222222222	0.55401662
30	*Cinnamomum* sp. (1)	0.222222222	0.55401662
31	*Eugenia oblata* Roxb.	0.222222222	0.55401662
32	*Hopea sangal* Korth.	0.222222222	0.55401662
33	*Lagerstroemia macrocarpa* Kurz	0.222222222	0.55401662
34	*Laportea crenulata* Gaud.	0.222222222	0.55401662
35	*Microcos paniculata* L.	0.222222222	0.55401662
36	*Quercus* sp.(1)	0.222222222	0.55401662
37	*Stereospermum colais* (Buch.-Ham. Ex Dillwyn) Mabb.	0.222222222	0.55401662
38	*Symplocos* sp. (1)	0.222222222	0.55401662
39	Anacardiaceae	0.111111111	0.27700831
40	*Capparaceae*	0.111111111	0.27700831
41	*Carallia brachiata* (Lour.)Merr.	0.111111111	0.27700831
42	*Chisocheton paniculatus Hcern.*	0.111111111	0.27700831
43	*Cinnamomum pachyphyllum* Kosterm.	0.111111111	0.27700831
44	*Dipterocarpus alatus* Roxb.	0.111111111	0.27700831
45	*Dipterocarpus grandiflorus* Blanco	0.111111111	0.27700831
46	*Emblica officinalis* Gaertn.	0.111111111	0.27700831
47	*Ficus* sp. (1)	0.111111111	0.27700831
48	*Garcinia heterandra* Wall.	0.111111111	0.27700831

49	*Gelonium multiflorum* A.Juss	0.111111111	0.27700831
50	*Heterophragma adenophylla* (Wall.) Seem. ex Benth. & Hook.	0.111111111	0.27700831
51	*Lagerstroemia floribunda* Jack	0.111111111	0.27700831
52	*Litsea* sp.(1)	0.111111111	0.27700831
53	*Mangifera caloneura* Kurz	0.111111111	0.27700831
54	*Pandanus foetidus* Roxb.	0.111111111	0.27700831
55	*Payena oleifera* Watt.	0.111111111	0.27700831
56	*Rinorea* sp.	0.111111111	0.27700831
57	Rubiaceae	0.111111111	0.27700831
58	*Spondias pinnata* (L.)Kurz.	0.111111111	0.27700831
59	*Talipariti macrophyllum* (Roxb. ex Hornem.) Fryxell	0.111111111	0.27700831
60	*Tetramelea nudiflora* R.Br.	0.111111111	0.27700831
61	*Xerospermum noronhianum* Blume	0.111111111	0.27700831

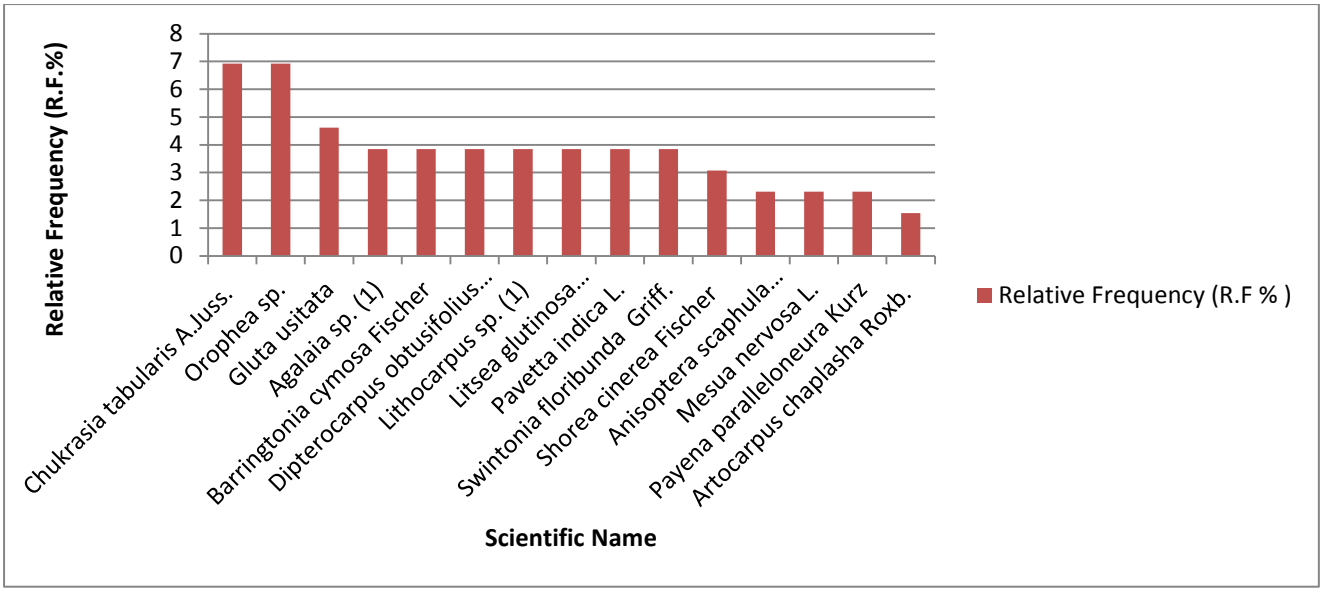


4.1.4 Relative frequency of Tree species

Relative frequency is the frequency of one species compared to the total frequency of all the species. According the results**,** *Chukrasia tabularis* A.Juss. and *Orophea* sp. had equally high relative frequency value (6.923 %) followed by *Gluta usitata* (4.615%), *Agalaia* sp. (1) (3.846%), *Barringtonia cymosa* Fischer (3.846%), and *Dipterocarpus obtusifolius* Teysm. (3.846%) respectively. Therefore these species occur everywhere in the study area.

No.	Scientific name	Frequency (F)	Relative Frequency (R.F %)
1	*Chukrasia tabularis* A.Juss.	1.0	6.923076923
2	*Orophea* sp.	1.0	6.923076923
3	*Gluta usitata*	0.666666667	4.615384615
4	*Agalaia* sp. (1)	0.555555556	3.846153846
5	*Barringtonia cymosa* Fischer	0.555555556	3.846153846
6	*Dipterocarpus obtusifolius* Teysm.	0.555555556	3.846153846
7	*Lithocarpus* sp. (1)	0.555555556	3.846153846
8	*Litsea glutinosa* (Lour.)C.B.Robins.	0.555555556	3.846153846
9	*Pavetta indica* L.	0.555555556	3.846153846
10	*Swintonia floribunda* Griff.	0.555555556	3.846153846
11	*Shorea cinerea* Fischer	0.444444444	3.076923077
12	*Anisoptera scaphula (Roxb.)* Pierre	0.333333333	2.307692308
13	*Mesua nervosa* L.	0.333333333	2.307692308
14	*Payena paralleloneura* Kurz	0.333333333	2.307692308
15	*Artocarpus chaplasha* Roxb.	0.222222222	1.538461538
16	*Baccaurea sapida* Muell.Arg.	0.222222222	1.538461538
17	*Bouea burmanica* Griff	0.222222222	1.538461538
18	*Dillenia parviflora* Griff	0.222222222	1.538461538
19	*Dipterocarpus* sp.	0.222222222	1.538461538
20	*Dipterocarpus turbinatus* Gaertn.f.	0.222222222	1.538461538
21	*Eugenia oblata* Roxb.	0.222222222	1.538461538
22	*Pentace griffithii* King	0.222222222	1.538461538
23	*Phoebe tavoyana* (Meissner) Hook.F.	0.222222222	1.538461538
24	*Pterospermum semisagittatum* Buch-Ham	0.222222222	1.538461538
25	*Quercus* sp.(1)	0.222222222	1.538461538
26	Anacardiaceae	0.111111111	0.769230769
27	*Areca triandra* Roxb.	0.111111111	0.769230769
28	*Callerya atropurpurea* (Wall.) Schot.	0.111111111	0.769230769
29	*Capparaceae*	0.111111111	0.769230769
30	*Carallia brachiata* (Lour.)Merr.	0.111111111	0.769230769
31	*Caryota mitis* Lour.	0.111111111	0.769230769
32	*Chisocheton paniculatus Hcern.*	0.111111111	0.769230769
33	*Cinnamomum pachyphyllum* Kosterm.	0.111111111	0.769230769
34	*Cinnamomum* sp. (1)	0.111111111	0.769230769

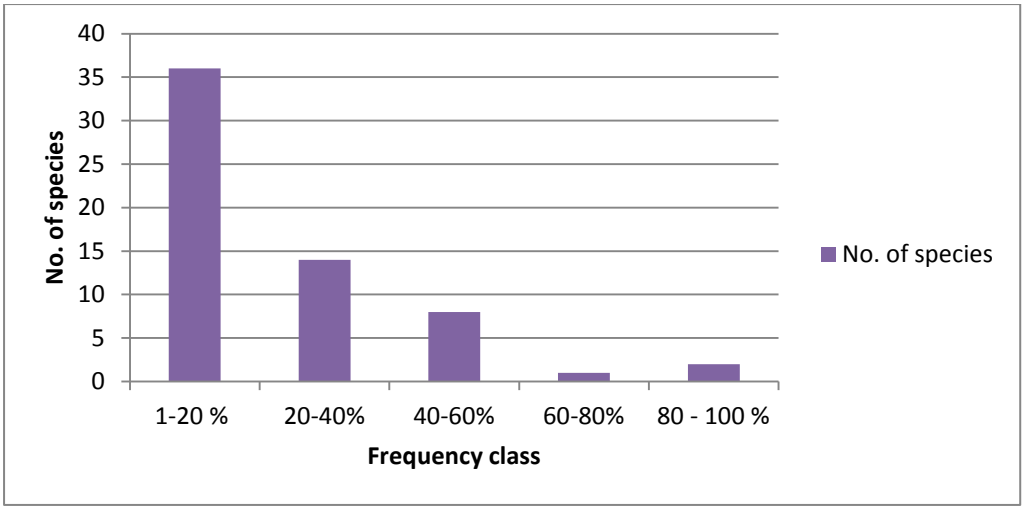
35	*Dipterocarpus alatus* Roxb.	0.111111111	0.769230769
36	*Dipterocarpus grandiflorus* Blanco	0.111111111	0.769230769
37	*Emblica officinalis* Gaertn.	0.111111111	0.769230769
38	*Ficus* sp. (1)	0.111111111	0.769230769
39	*Garcinia heterandra* Wall.	0.111111111	0.769230769
40	*Gelonium multiflorum* A.Juss	0.111111111	0.769230769
41	*Heterophragma adenophylla* (Wall.) Seem. ex Benth. & Hook.	0.111111111	0.769230769
42	*Hopea sangal* Korth.	0.111111111	0.769230769
43	*Lagerstroemia floribunda* Jack	0.111111111	0.769230769
44	*Lagerstroemia macrocarpa* Kurz	0.111111111	0.769230769
45	*Laportea crenulata* Gaud.	0.111111111	0.769230769
46	*Litsea* sp.(1)	0.111111111	0.769230769
47	*Mangifera caloneura* Kurz	0.111111111	0.769230769
48	*Microcos paniculata* L.	0.111111111	0.769230769
49	*Myristica angustifolia* Roxb.	0.111111111	0.769230769
50	*Pandanus foetidus* Roxb.	0.111111111	0.769230769
51	*Payena oleifera* Watt.	0.111111111	0.769230769
52	*Rinorea* sp.	0.111111111	0.769230769
53	Rubiaceae	0.111111111	0.769230769
54	*Shorea* sp.	0.111111111	0.769230769
55	*Spondias pinnata* (L.)Kurz.	0.111111111	0.769230769
56	*Stereospermum colais* (Buch.-Ham. Ex Dillwyn) Mabb.	0.111111111	0.769230769
57	*Symplocos* sp. (1)	0.111111111	0.769230769
58	*Taliparitimacrophyllum* (Roxb. ex Hornem.) Fryxell	0.111111111	0.769230769
59	*Tetramelea nudiflora* R.Br.	0.111111111	0.769230769
60	*Trevesia palmata* (Roxb. Ex Lind.) Vis	0.111111111	0.769230769
61	*Xerospermum noronhianum* Blume	0.111111111	0.769230769



4.1.5 Species distribution by frequency class

In order to clarify the homogeneity and heterogeneity of the floristic distribution in the area, the species distribution by frequency class was examined. According to the outcome of the frequency classes, only two species are in high frequency class and 50% of the species are in low frequency class. This shows that this area is floristically high degree of heterogeneity.

Frequency class	No. of species
1-20 %	36
20-40%	14
40-60%	8
60-80%	1
80 - 100 %	2



4.1.6 Vegetation type in the study area

No.	Locality	Vegetation type	Latitude	Longitude	Altitude	Note
1.	Along the Phaw San Stream near 49 Kilometer	Deciduous	N 14˚ 44' 38.3"	E 098˚ 11' 08.8"	66m	*Chukrasia tabularis, Dipterocarpus turbinatus, Dipterocarpus obtusifolius, Myristica angustifolia, Mesua nervosa, Orophea* sp., *Pavetta indica & Shorea* sp.
2.	Along the Kyauklongyi Stream	Deciduous	N 14˚ 41' 26.8"	E 098˚ 17' 42.0"	137.1m	
3.	Near Kyauklongyi Outpost	Deciduous	N 14˚ 41' 32.1"	E 098˚ 17' 15.4"	141.6m	
4.	At the foot of Phaw san Hill	Deciduous	N 14˚ 44' 15.1"	E 098˚ 11' 51.9"	114m	
5.	At the top of Kya-kon-taung	Deciduous	N 14˚ 39' 59.5"	E 098˚ 19' 26.1"	225.9m	
6.	Near Zinbar Stream	Evergreen	N 14˚ 40' 32.1"	E 098˚ 20' 06.7"	383.1m	*Chukrasia tabularis, Gluta usitata & Payena paralleloneura*
7.	Near Phaw san Stream	Riverine	N 14˚ 44' 44.8"	E 098˚ 11' 10.2"	123m	*Aglaia* sp.,*Barringtonia cymosa, Callerya atropurpurea, Chukrasia tabularis, Dipterocarpus obtusifolius, Dipterocarpus turbinatus, Orophea* sp., *Shoreacinerea*
8.	Near Thaungtharku Stream	Riverine	N 14˚ 42' 23.5"	E 098˚ 16' 12.4"	123.15 m	
9.	At the end of Mainmapan Stream	Riverine	N 14˚ 38' 04.2"	E 098˚ 12' 48.1"	49.2m	

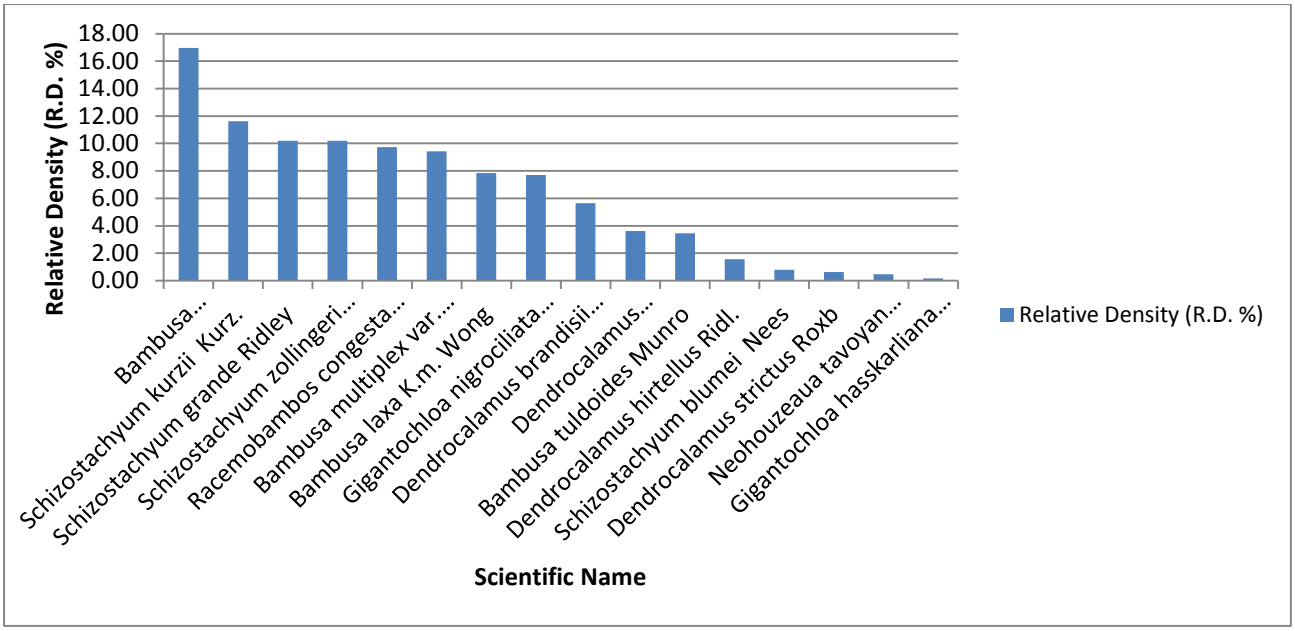
4.1.7 Bamboo Species Population

No.	Scientific Name	No. of individual	Total no. of individual/ha	Total no. of population/ha (%)
1	*Neohouzeaua tavoyan* (Gamble) Munro	3	6	0.470957614
2	*Dendrocalamus strictus* Roxb	4	8	0.627943485
3	*Racemobambos congesta* (Pilger)Holttum	62	127	9.733124019
4	*Bambusa tuldoides* Munro	22	45	3.453689168
5	*Gigantochloa nigrociliata* (Buse) Kurz.	49	100	7.692307692
6	*Bambusa heterostachya* (Munro) Holttum.	108	220	16.9544741
7	*Dendrocalamus membranceus* Munro	23	47	3.610675039
8	*Dendrocalamus hirtellus* Ridl.	10	20	1.569858713
9	*Schizostachyum kurii* Kurz.	74	151	11.61695447
10	*Gigantochloa hasskarliana* (Kurz.)	1	2	0.156985871

11	*Bambusa multiplex* var. *multiplex* Nakai	60	122	9.419152276
12	*Bambusa laxa* K.m. Wong	50	102	7.849293564
13	*Dendrocalamus brandisii* (Munro) Kurz.	36	73	5.651491366
14	*Schizostachyum zollingeri*	65	133	10.20408163
15	*Schizostachyum grande* Ridley	65	133	10.20408163
16	*Schizostachyum blumei* Nees	5	10	0.784929356
	Total	**637**	**1300**	**100**

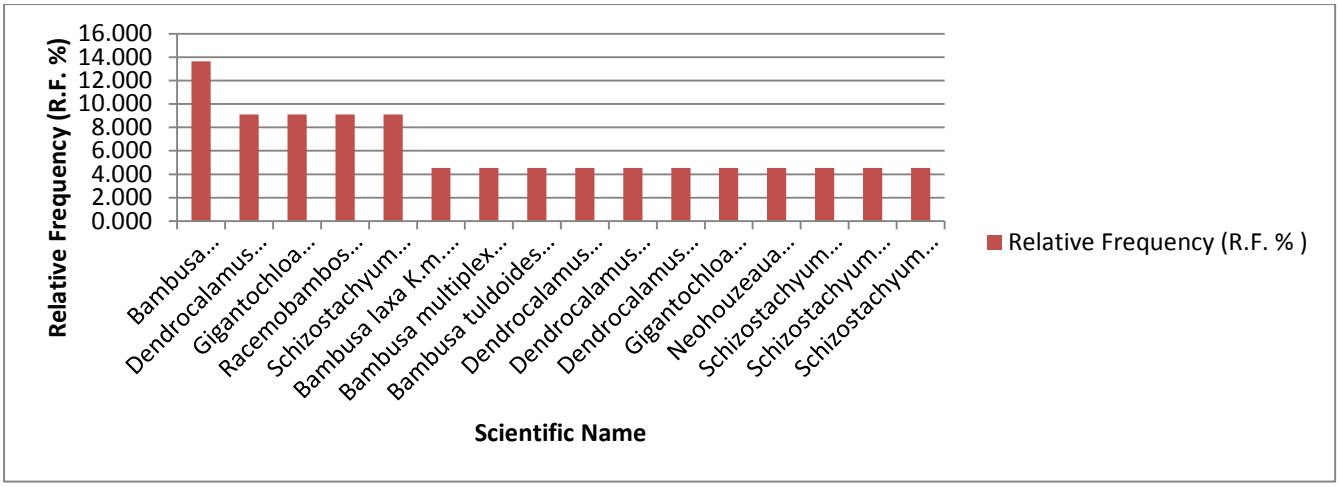
4.1.8. Relative density

No.	Scientific name	Density (D)	Relative Density (R.D. %)
1	*Bambusa heterostachya* (Holttum.)	18.000	16.9545
2	*Schizostachyum kurzii* Kurz.	12.333	11.6170
3	*Schizostachyum grande* Ridley	10.833	10.2041
4	*Schizostachyum zollingeri* Steud.	10.833	10.2041
5	*Racemobambos congesta* (Pilger) Holttum.	10.333	9.7331
6	*Bambusa multiplex* var. *multiplex* Nakai	10.000	9.4192
7	*Bambusa laxa* K.m. Wong	8.333	7.8493
8	*Gigantochloa nigrociliata* (Buse) Kurz.	8.167	7.6923
9	*Dendrocalamus brandisii* (Munro) Kurz.	6.000	5.6515
10	*Dendrocalamus membranceus* Munro	3.833	3.6107
11	*Bambusa tuldoides* Munro	3.667	3.4537
12	*Dendrocalamus hirtellus* Ridl.	1.667	1.5699
13	*Schizostachyum blumei* Nees	0.833	0.7849
14	*Dendrocalamus strictus* Roxb	0.667	0.6279
15	*Neohouzeaua tavoyan* (Gamble) Munro	0.500	0.4710
16	*Gigantochloa hasskarliana* (Kurz.)	0.167	0.1570



4.1.9. Species distribution

No.	Scientific name	Frequency (F)	Relative Frequency (R.F. %)
1	*Bambusa heterostachya* (Holttum.)	0.500	13.636
2	*Dendrocalamus membranceus* Munro	0.333	9.091
3	*Gigantochloa nigrociliata* (Buse) Kurz.	0.333	9.091
4	*Racemobambos congesta* (Pilger) Holttum.	0.333	9.091
5	*Schizostachyum kurzii* Kurz.	0.333	9.091
6	*Bambusa laxa* K.m. Wong	0.167	4.545
7	*Bambusa multiplex* var. *multiplex* Nakai	0.167	4.545
8	*Bambusa tuldoides* Munro	0.167	4.545
9	*Dendrocalamus brandisii* (Munro) Kurz.	0.167	4.545
10	*Dendrocalamus hirtellus* Ridl.	0.167	4.545
11	*Dendrocalamus strictus* Roxb	0.167	4.545
12	*Gigantochloa hasskarliana* (Kurz.)	0.167	4.545
13	*Neohouzeaua tavoyan* (Gamble) Munro	0.167	4.545
14	*Schizostachyum blumei* Nees	0.167	4.545
15	*Schizostachyum grande* Ridley	0.167	4.545
16	*Schizostachyum zollingeri* Steud.	0.167	4.545



4.1.10 Discussion

A total of 61 species belonging to 53 genera were analyzed in the study area. The main vegetation types in this area can be grouped into three formation i.e. evergreen forest, deciduous forest, riverine forest and bamboo forest. The secondary forests are also found near bamboo forest. The leading dominant species are *Chukrasia tabularis, Orophea sp., Gluta sp., Dipterocarpus sp., Lithocarpus* sp. *and litsea glutinosa. Churasia tabularis* and *Orophea* are highest in frequency so that these species are said to be common in this area. Out of 61 species 50 species are in low frequency class. So these species are rare species in this area.These include *Dipterocarpus grandiflorus, Dipterocarpus alatus, Hopea sangal, Shorea* sp.*and litsea sp.* The dominant bamboo species were *Bambusa* sp. and *Dendroclamus* sp., *Racemobamboos* sp. and *Gigantocholia* sp. and these two species are also in highest in frequency.

The forests in this area show some types of disturbance. The canopy of the forest is more or less opened. The canopy layer is dominated by *Nauclea sessilifolia* Roxb. (Thit-pa-yaung), *Barringtonia cyosa* (Kalagyi-ywet-gyi), *Aporosa roxburghii* Baill. (Thit-khauk) and *Nephelium sp.*(Kyet-mauk-ni).The emergent tree species are *Eugenia oblate* (tha-bye-ni), *Shorea cinerea* (Ka-dut), *Anisoptera scaphula* (Kaung-mu) *Shorea* sp.(Hput-ma-tet) and *Syzygium* sp.(1) (Tha-bye-phyu). The presence of some secondary forests shows the influence of human impacts on the forest.

4.2 Kyaukshat area

Primary Forest

Secondary Forest

Bamboo Forest

4.2.1 Floristic composition

The total number of tree species in 5 representative sample plots is 77 species belonging to 64 genera. Bamboos species are scare in this area .There are four bamboo species in two sample plots. *Gigentochloa apus* Kurz. is the dominant species. The dominant tree species in this area are *Licuala peltata* Roxb. (Sa-lu), *Aporosa villosula* Kurz. (Thit-khauk) and *Swintonia floribunda* Griff. (Shit-lae) followed by *Nephelium lappaceum* L. (Kyet-mauk-wa).

4.2.2Tree Species Population

No.	Scientific Name	No. of individual	Total no. of individual/ha	Total no. of population/ha (%)
1	*Actinodaphne* sp.(2)	2	5	0.4057
2	*Aglaia andamanica* Hiern	14	35	2.8398
3	*Aglaia* sp.(1)	5	13	1.0142

4	*Albizia chinensis* (Osbeck) Merr.	5	13	1.0142
5	*Amoora* sp.	1	3	0.2028
6	*Amoora wallichii* King	4	10	0.8114
7	*Anisoptera curtisii* Dyer	1	3	0.2028
8	*Anisoptera scaphula* (Roxb.) Pierre	1	3	0.2028
9	*Vaccinium donianum* Wight.	4	10	0.8114
10	*Aporosa villosula* Kurz.	40	100	8.1136
11	*Arenga saccharifera* Labill.	4	10	0.8114
12	*Artocarpus chaplasha* Roxb.	1	3	0.2028
13	*Barringtonia cymosa* Fischer	8	20	1.6227
14	Caesalpiniaceae	3	8	0.6085
15	*Callerya atropurpurea* (Wall.) Schot.	1	3	0.2028
16	*Chukrasia tabularis* A.Juss.	13	33	2.6369
17	*Cinnamomum pachyphyllum* Kosterm.	6	15	1.2170
18	*Dillenia parviflora* Griff	1	3	0.2028
19	*Diospyros crumentata* Thwaites	5	13	1.0142
20	*Diospyros dictyoneura* Hiern.	6	15	1.2170
21	*Diospyros peregrine* (Gaertn.)Gurke	7	18	1.4199
22	*Diospyros* sp.	2	5	0.4057
23	*Dipterocarpus* sp.	3	8	0.6085
24	*Dracontomelon dao* (Blume) Merr.&Rolfe	1	3	0.2028
25	*Duabanga grandiflora* Walp	4	10	0.8114
26	*Eugenia oblata* Roxb.	6	15	1.2170
27	*Euonymus javanicus* Blume	2	5	0.4057
28	*Garcinia cowa* Roxb.	1	3	0.2028
29	*Garcinia merguensis* Wight	1	3	0.2028
30	*Garcinia* sp.	1	3	0.2028
31	*Gardenia sootepensis* Hutch.	2	5	0.4057
32	*Glochidion* sp.	1	3	0.2028
33	*Gmelina arborea* Roxb.	2	5	0.4057
34	*Gnetum gnemon* L.	15	38	3.0426
35	*Gonocaryum griffithianum* (Miers)Kurz	12	30	2.4341
36	*Heterophragma adenophylla* (Wall.) Seem. ex Benth. & Hook.	4	10	0.8114
37	*Hopea sangal* Korth.	1	3	0.2028

38	*Irvingia malayana* Oliver	2	5	0.4057
39	*Licuala peltata* Roxb.	78	195	15.8215
40	*Lithocarpus sootepensis*	2	5	0.4057
41	*Litsea glutinosa* (Lour.)C.B. Robins.	1	3	0.2028
42	*Litsea grandis* (Nees) Hook.f	1	3	0.2028
43	*Mangifera caloneura* Kurz	23	58	4.6653
44	Meliaceae	3	8	0.6085
45	*Michelia champaca* L.	4	10	0.8114
46	*Microcos paniculata* L.	2	5	0.4057
47	*Myristica angustifolia* Roxb.	23	58	4.6653
48	*Myristica malabarica* Lan.	3	8	0.6085
49	*Nauclea sessilifolia* Roxb.	2	5	0.4057
50	*Nephelium lappaceum* L.	26	65	5.2738
51	*Nephelium* sp.	3	8	0.6085
52	*Olax scandens* Roxb.	1	3	0.2028
53	*Ormosia watsonii* Fisch	13	33	2.6369
54	*Orophea* sp.	6	15	1.2170
55	*Parashorea stellata* Kurz.	12	30	2.4341
56	*Pavetta indica* L.	5	13	1.0142
57	*Payena paralleloneura* Kurz	3	8	0.6085
58	*Pentace griffithii* King	6	15	1.2170
59	*Phoebe lanceolata* (Nees) Nees	1	3	0.2028
60	*Polyalthia* sp.	2	5	0.4057
61	*Pterocymbium* sp.	1	3	0.2028
62	*Pterospermum semisagittatum* Buch-Ham	1	3	0.2028
63	*Putranjiva roxburghii* Wall.	2	5	0.4057
64	*Quercus spicata* Smith.	6	15	1.2170
65	*Rothmannia sootepensis*	12	30	2.4341
66	*Salacca wallichiana* Mart.	1	3	0.2028
67	*Sandoricum koetjape* (Burm.f.) Merr.	1	3	0.2028
68	*Schima wallichii* (DC.)Korth.	1	3	0.2028
69	*Sterculia pexa*	1	3	0.2028
70	*Sterculia versicolor* Wall.	1	3	0.2028
71	*Swintonia floribunda* Griff.	29	73	5.8824
72	*Syzygium claviflorum* (Roxb.)A.M.Cowan &Cowan	9	23	1.8256

73	*Syzygium* sp.(1)	3	8	0.6085
74	*Theobroma* sp.	4	10	0.8114
75	*Vatica dyeri* King	1	3	0.2028
76	*Xanthophyllum lanceatum* (Miq.)J.J.Sm.	1	3	0.2028
77	*Xerospermum noronhianum* (Blume)Blume	7	18	1.4199
	Total	**493**	**1233**	**100**

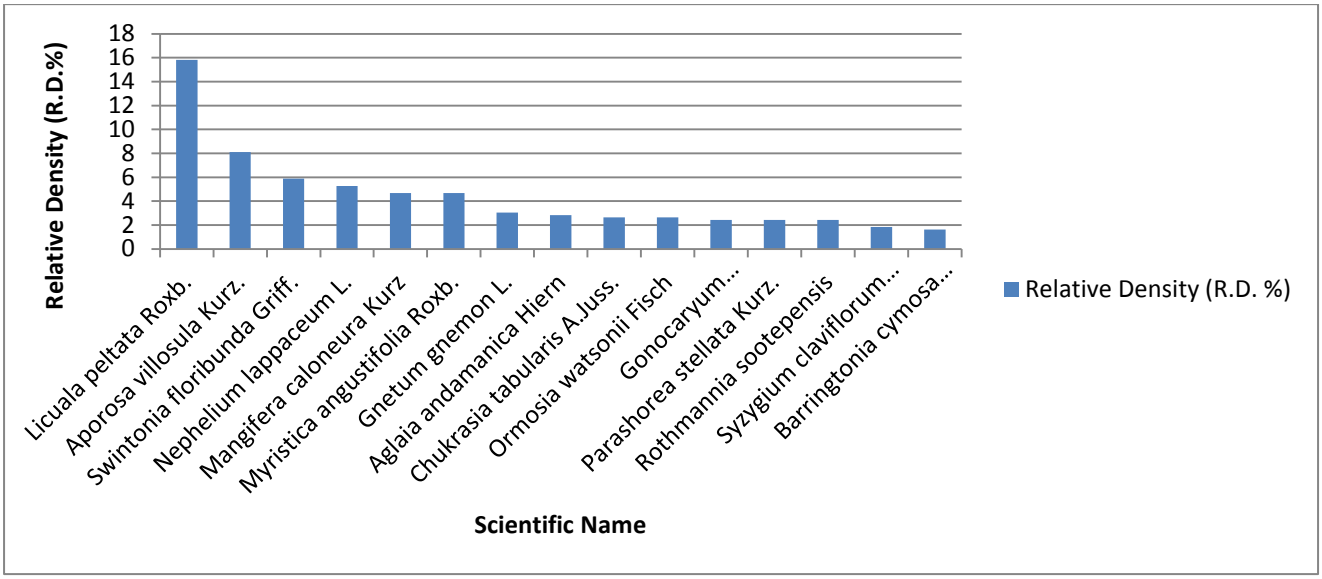
4.2.3 Relative density

Among the sample plots species density per hectare varied and the highest density was observed *Hopea sangal* followed by *Vaccinium donianum* Wight.. This shows that these two species are abundant in this area.

No.	Scientific name	Density (D)	Relative Density (R.D. %)
1	*Licuala peltata Roxb.*	15.6	15.82150101
2	*Aporosa villosula* Kurz.	8	8.113590264
3	*Swintonia floribunda* Griff.	5.8	5.882352941
4	*Nephelium lappaceum* L.	5.2	5.273833671
5	*Mangifera caloneura* Kurz	4.6	4.665314402
6	*Myristica angustifolia* Roxb.	4.6	4.665314402
7	*Gnetum gnemon* L.	3	3.042596349
8	*Aglaia andamanica* Hiern	2.8	2.839756592
9	*Chukrasia tabularis* A.Juss.	2.6	2.636916836
10	*Ormosia watsonii* Fisch	2.6	2.636916836
11	*Gonocaryum griffithianum* (Miers)Kurz	2.4	2.434077079
12	*Parashorea stellata* Kurz.	2.4	2.434077079
13	*Rothmannia sootepensis*	2.4	2.434077079
14	*Syzygium claviflorum* (Roxb.)A.M.Cowan &Cowan	1.8	1.825557809
15	*Barringtonia cymosa* Fischer	1.6	1.622718053
16	*Diospyros peregrine* (Gaertn.)Gurke	1.4	1.419878296
17	*Xerospermum noronhianum* (Blume)Blume	1.4	1.419878296
18	*Cinnamomum pachyphyllum* Kosterm.	1.2	1.21703854
19	*Diospyros dictyoneura* Hiern.	1.2	1.21703854
20	*Eugenia oblata* Roxb.	1.2	1.21703854
21	*Orophea* sp.	1.2	1.21703854

22	*Pentace griffithii* King	1.2	1.21703854
23	*Quercus spicata* Smith.	1.2	1.21703854
24	*Aglaia* sp.(1)	1	1.014198783
25	*Albizia chinensis* (Osbeck) Merr.	1	1.014198783
26	*Diospyros crumentata* Thwaites	1	1.014198783
27	*Pavetta indica* L.	1	1.014198783
28	*Amoora wallichii* King	0.8	0.811359026
29	*Vaccinium donianum* Wight.	0.8	0.811359026
30	*Arenga saccharifera* Labill.	0.8	0.811359026
31	*Duabanga grandiflora* Walp	0.8	0.811359026
32	*Heterophragma adenophylla* (Wall.) Seem. ex Benth. & Hook.	0.8	0.811359026
33	*Michelia champaca* L.	0.8	0.811359026
34	*Theobroma* sp.	0.8	0.811359026
35	Caesalpiniaceae	0.6	0.60851927
36	*Dipterocarpus* sp.	0.6	0.60851927
37	Meliaceae	0.6	0.60851927
38	*Myristica malabarica* Lan.	0.6	0.60851927
39	*Nephelium* sp.	0.6	0.60851927
40	*Payena paralleloneura* Kurz	0.6	0.60851927
41	*Syzygium* sp.(1)	0.6	0.60851927
42	*Actinodaphne* sp.(2)	0.4	0.405679513
43	*Diospyros* sp.	0.4	0.405679513
44	*Euonymus javanicus* Blume	0.4	0.405679513
45	*Gardenia sootepensis* Hutch.	0.4	0.405679513
46	*Gmelina arborea* Roxb.	0.4	0.405679513
47	*Irvingia malayana* Oliver	0.4	0.405679513
48	*Lithocarpus sootepensis*	0.4	0.405679513
49	*Microcos paniculata* L.	0.4	0.405679513
50	*Nauclea sessilifolia* Roxb.	0.4	0.405679513
51	*Polyalthia* sp.	0.4	0.405679513
52	*Putranjiva roxburghii* Wall.	0.4	0.405679513
53	*Amoora* sp.	0.2	0.202839757
54	*Anisoptera curtisii* Dyer	0.2	0.202839757
55	*Anisoptera scaphula* (Roxb.) Pierre	0.2	0.202839757
56	*Artocarpus chaplasha* Roxb.	0.2	0.202839757
57	*Callerya atropurpurea* (Wall.) Schot.	0.2	0.202839757

58	*Dillenia parviflora* Griff	0.2	0.202839757
59	*Dracontomelon dao* (Blume) Merr.&Rolfe	0.2	0.202839757
60	*Garcinia cowa* Roxb.	0.2	0.202839757
61	*Garcinia merguensis* Wight	0.2	0.202839757
62	*Garcinia* sp.	0.2	0.202839757
63	*Glochidion* sp.	0.2	0.202839757
64	*Hopea sangal* Korth.	0.2	0.202839757
65	*Litsea glutinosa* (Lour.)C.B. Robins.	0.2	0.202839757
66	*Litsea grandis* (Nees) Hook.f	0.2	0.202839757
67	*Olax scandens* Roxb.	0.2	0.202839757
68	*Phoebe lanceolata* (Nees) Nees	0.2	0.202839757
69	*Pterocymbium* sp.	0.2	0.202839757
70	*Pterospermum semisagittatum* Buch-Ham	0.2	0.202839757
71	*Salacca wallichiana* Mart.	0.2	0.202839757
72	*Sandoricum koetjape* (Burm.f.) Merr.	0.2	0.202839757
73	*Schima wallichii* (DC.)Korth.	0.2	0.202839757
74	*Sterculia pexa*	0.2	0.202839757
75	*Sterculia versicolor* Wall.	0.2	0.202839757
76	*Vatica dyeri* King	0.2	0.202839757
77	*Xanthophyllum lanceatum* (Miq.)J.J.Sm.	0.2	0.202839757



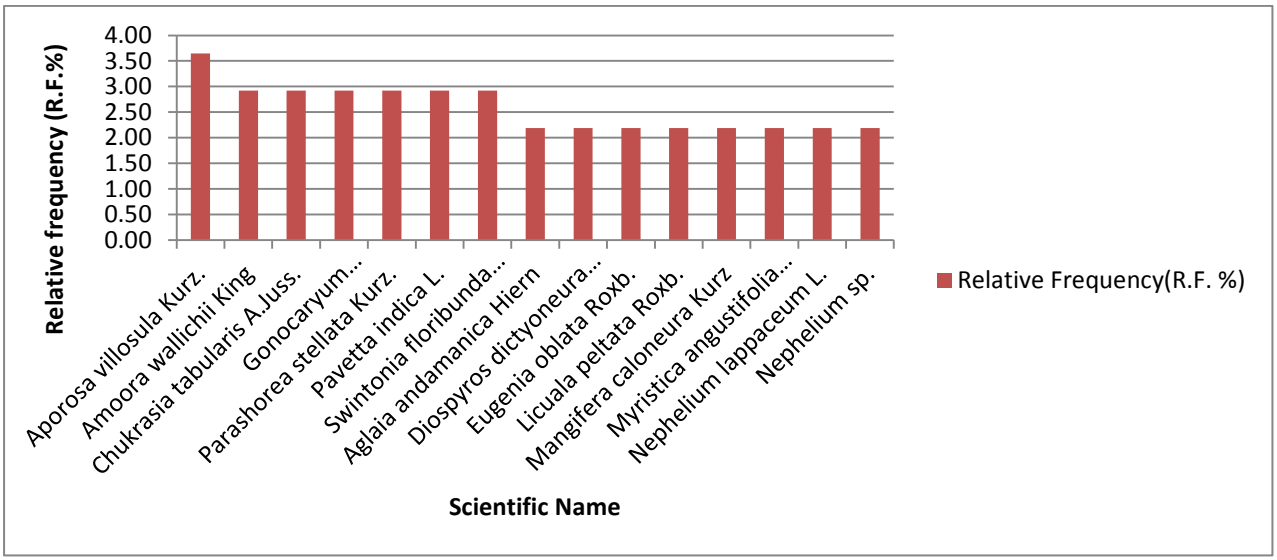
4.2.4 Relative frequency of Tree species

Relative frequency is the frequency of one species compared to the total frequency of all the species. According the results**,** *Aporosa villosula* Kurz. had high relative frequency value (3.649 %) followed by *Amoora wallichii* King (2.919 %), *Chukrasia tabularis* A.Juss. (2.919 %), *Gonocaryum griffithianum* (Miers) Kurz (2.919%), and *Parashorea stellata* Kurz. (2.919%) respectively. Therefore these species occur everywhere in the study area.

No.	Scientific Name	Frequency (F)	Relative Frequency (R.F. %)
1	*Aporosa villosula* Kurz.	1	3.649635036
2	*Amoora wallichii* King	0.8	2.919708029
3	*Chukrasia tabularis* A.Juss.	0.8	2.919708029
4	*Gonocaryum griffithianum* (Miers)Kurz	0.8	2.919708029
5	*Parashorea stellata* Kurz.	0.8	2.919708029
6	*Pavetta indica* L.	0.8	2.919708029
7	*Swintonia floribunda* Griff.	0.8	2.919708029
8	*Aglaia andamanica* Hiern	0.6	2.189781022
9	*Diospyros dictyoneura* Hiern.	0.6	2.189781022
10	*Eugenia oblata* Roxb.	0.6	2.189781022
11	*Licuala peltata* Roxb.	0.6	2.189781022
12	*Mangifera caloneura* Kurz	0.6	2.189781022
13	*Myristica angustifolia* Roxb.	0.6	2.189781022
14	*Nephelium lappaceum* L.	0.6	2.189781022
15	*Nephelium* sp.	0.6	2.189781022
16	*Cinnamomum pachyphyllum* Kosterm.	0.4	1.459854015
17	*Diospyros crumentata* Thwaites	0.4	1.459854015
18	*Diospyros peregrine* (Gaertn.)Gurke	0.4	1.459854015
19	*Diospyros* sp.	0.4	1.459854015
20	*Gardenia sootepensis* Hutch.	0.4	1.459854015
21	*Gmelina arborea* Roxb.	0.4	1.459854015
22	*Gnetum gnemon* L.	0.4	1.459854015
23	*Litsea glutinosa* (Lour.)C.B. Robins.	0.4	1.459854015
24	Meliaceae	0.4	1.459854015
25	*Microcos paniculata* L.	0.4	1.459854015
26	*Ormosia watsonii* Fisch	0.4	1.459854015
27	*Orophea* sp.	0.4	1.459854015

28	*Payena paralleloneura* Kurz	0.4	1.459854015
29	*Pentace griffithii* King	0.4	1.459854015
30	*Phoebe tavoyana* (Meissner) Hook.F.	0.4	1.459854015
31	*Quercus* sp.	0.4	1.459854015
32	*Rothmannia sootepensis*	0.4	1.459854015
33	*Sterculia pexa*	0.4	1.459854015
34	*Syzygium claviflorum* (Roxb.)A.M.Cowan &Cowan	0.4	1.459854015
35	*Syzygium* sp.(1)	0.4	1.459854015
36	*Theobroma* sp.	0.4	1.459854015
37	*Xerospermum noronhianum* (Blume)Blume	0.4	1.459854015
38	*Achras zapota* L.	0.2	0.729927007
39	*Actinodaphne* sp.(2)	0.2	0.729927007
40	*Aglaia* sp.(1)	0.2	0.729927007
41	*Albizia chinensis* (Osbeck) Merr.	0.2	0.729927007
42	*Amoora* sp.	0.2	0.729927007
43	*Anisoptera curtisii* Dyer	0.2	0.729927007
44	*Anisoptera scaphula* (Roxb.) Pierre	0.2	0.729927007
45	*Vaccinium donianum* Wight.	0.2	0.729927007
46	*Arenga saccharifera* Labill.	0.2	0.729927007
47	*Artocarpus chaplasha* Roxb.	0.2	0.729927007
48	*Barringtonia cymosa* Fischer	0.2	0.729927007
49	Caesalpiniaceae	0.2	0.729927007
50	*Callerya atropurpurea* (Wall.) Schot.	0.2	0.729927007
51	*Cananga* sp.	0.2	0.729927007
52	*Dillenia parviflora* Griff	0.2	0.729927007
53	*Dipterocarpus* sp.	0.2	0.729927007
54	*Dracontomelon dao* (Blume) Merr.&Rolfe	0.2	0.729927007
55	*Duabanga grandiflora* Walp	0.2	0.729927007
56	*Euonymus javanicus* Blume	0.2	0.729927007
57	*Garcinia cowa* Roxb.	0.2	0.729927007
58	*Garcinia merguensis* Wight	0.2	0.729927007
59	*Garcinia* sp.	0.2	0.729927007
60	*Glochidion* sp.	0.2	0.729927007
61	*Heterophragma adenophylla* (Wall.) Seem. ex Benth. & Hook.	0.2	0.729927007

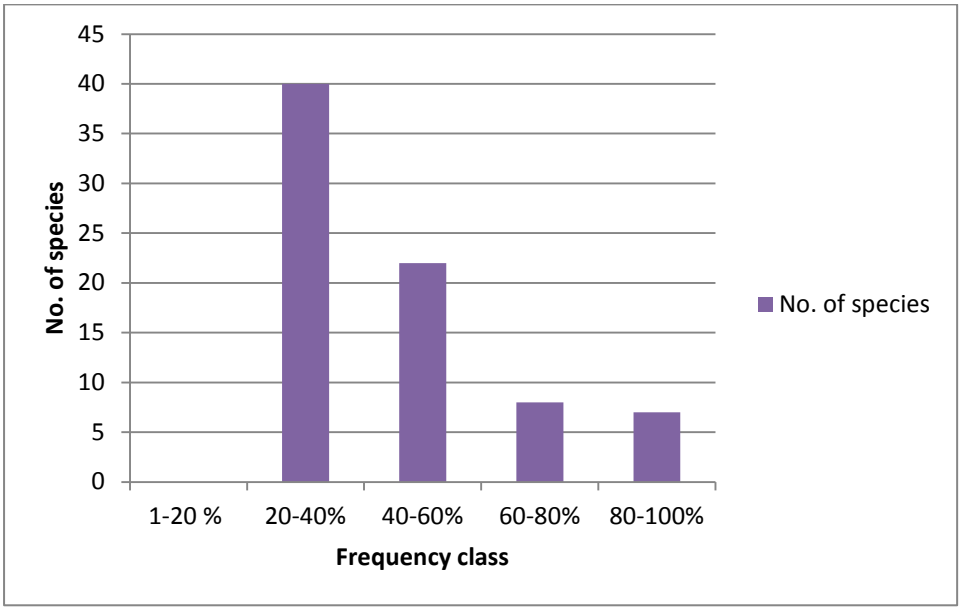
62	*Hopea sangal* Korth.	0.2	0.729927007
63	*Lithocarpus sootepensis*	0.2	0.729927007
64	*Michelia champaca* L.	0.2	0.729927007
65	*Myristica conferta* King	0.2	0.729927007
66	*Myristica malabarica* Lan.	0.2	0.729927007
67	*Nauclea sessilifolia* Roxb.	0.2	0.729927007
68	*Olax scandens* Roxb.	0.2	0.729927007
69	*Pterocymbium* sp.	0.2	0.729927007
70	*Pterospermum semisagittatum* Buch-Ham	0.2	0.729927007
71	*Quercus spicata* Smith.	0.2	0.729927007
72	*Salacca wallichiana* Mart.	0.2	0.729927007
73	*Sandoricum koetjape* (Burm.f.) Merr.	0.2	0.729927007
74	*Schima wallichii* (DC.)Korth.	0.2	0.729927007
75	*Sterculia versicolor* Wall.	0.2	0.729927007
76	*Vatica dyeri* King	0.2	0.729927007
77	*Xanthophyllum lanceatum* (Miq.)J.J.Sm.	0.2	0.729927007



4.2.5 Species distribution by frequency class

In order to clarify the homogeneity and heterogeneity of the floristic distribution in the area, the species distribution by frequency class was examined. According to the outcome of the frequency classes, only seven species are in high frequency class and 40% of the species are in intermediate frequency class. According to the results of frequency class, this area shows floristically heterogeneous.

Frequency class	No. of species
1-20 %	0
20-40%	40
40-60%	22
60-80%	8
80-100%	7



4.2.6 Vegetation types in the area

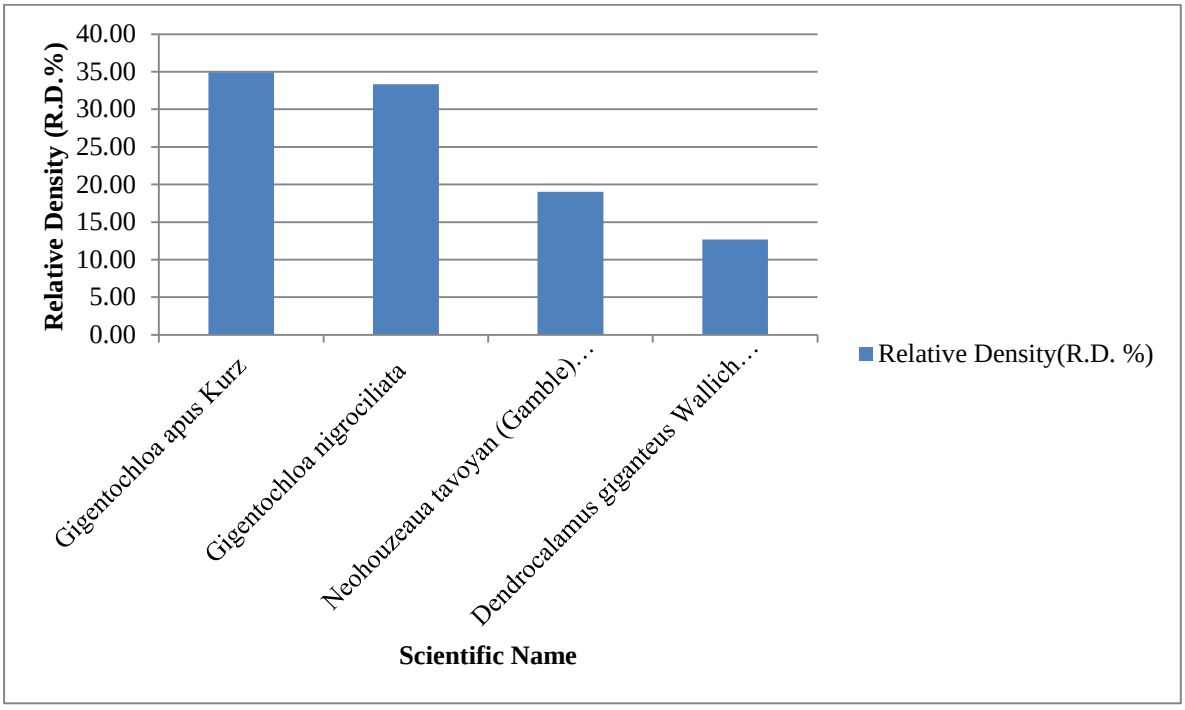
No.	Locality	Vegetation type	Latitude	Longitude	Altitude	Note
1.	Near Kamyauk Stream	Deciduous	N 14˚ 34' 62.9"	E 098˚ 13' 76.6"	155.7m	*Chukrasia tabularis, Swintonia floribunda, Albizia chinensis, Orophea* sp., *Aglaia* sp.(1)
2.	Near Yepu Stream	Riverine	N 14˚ 34' 03.7"	E 098˚ 13' 53.4"	133m	*Licuala peltata, Nephelium lappaceum, Aporosa villosula, Gnetum gnemon Ormosia watsonii, Barringtonia cymosa, Vaccinium donianum* Wight., *Heterophragma adenophylla, Rothmannia sootepensis, Mangifera caloneura*
3.	Mountain ranges near upstream of Newlain Stream	Riverine	N 14˚ 35' 94.3"	E 098˚ 12' 92.7"	226m	
4.	Near Bhothutaw Boad Pile, On the range between New lein stream and Kyauk shat stream	Riverine	N 14˚ 36' 23.4"	E 098˚ 13' 14.1"	411m	
5.	Between Kyauk shat and Mainmapain Streams	Deciduous, Riverine	N 14˚ 36' 44.0"	E 098˚ 13' 13.4"	351m	*Licuala peltata, Myristica angustifolia, Aporosa villosula, Mangifera caloneura*

4.2.7. Bamboo Species Population

No.	Scientific Name	No. of individual	Total no. of individual/ha	Total no. of population/ ha (%)
1	*Dendrocalamus giganteus* Wallich ex Munro	8	44	12.6984127
2	*Gigentochloa apus* Kurz	22	122	34.92063492
3	*Gigentochloa nigrociliata*	21	117	33.33333333
4	*Neohouzeaua tavoyan* (Gamble) Munro	12	67	19.04761905
	Total	**63**	**350**	**100**

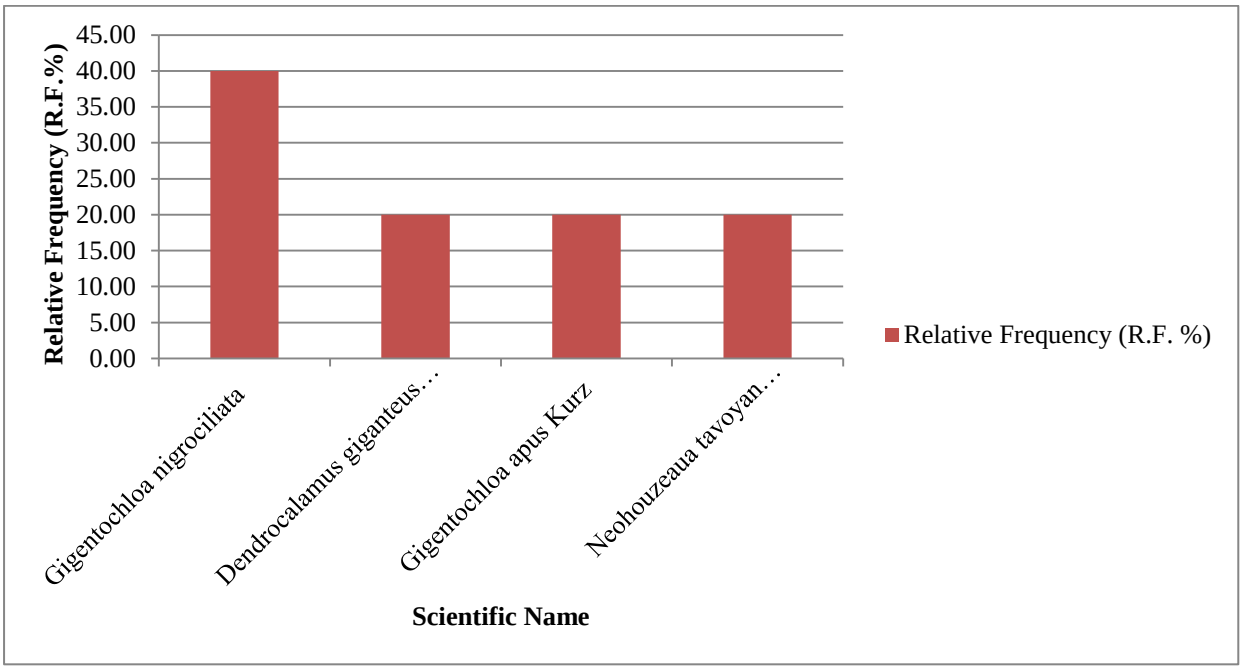
4.2.8 Relative density

No.	Scientific Name	Density (D)	Relative Density(R.D. %)
1	*Gigentochloa apus* Kurz	11	34.92063492
2	*Gigentochloa nigrociliata*	10.5	33.33333333
3	*Neohouzeaua tavoyan* (Gamble) Munro	6.00	19.04761905
4	*Dendrocalamus giganteus* Wallich ex Munro	4	12.6984127



4.2.9 Species distribution

No.	Scientific Name	Frequency (F)	Relative Frequency (R.F. %)
1	*Gigentochloa nigrociliata*	1	40
2	*Dendrocalamus giganteus* Wallich ex Munro	0.5	20
3	*Gigentochloa apus* Kurz	0.5	20
4	*Neohouzeaua tavoyan* (Gamble) Munro	0.5	20



4.2.10 Discussion

A total of 77 species belonging to 64 genera were analyzed in the study area. The main vegetation types in this area can be grouped into three formation i.e. deciduous forest, riverine forest and bamboo forest. The secondary forests are also found near bamboo forest. The leading dominant species are *Chukrasia tabularis, Swintonia floribunda*, *Licuala peltata, Nephelium lappaceum*, and *Aporosa villosula*, *Churasia tabularis* and *Swintonia floribunda* are highest in frequency so that these species are said to be common in this area.Out of 77 species 40 species are rare species since these species are in low frequency. The dominant bamboo species were *Gigentochloa apus* and *Gigentochloa nigrociliata* and these two species are also in highest in frequency.

The forests in this area show some types of disturbance. The canopy of the forest is more or less closed. The presence of some secondary forests shows the influence of human impacts on the forest.

4.3 Yebone Area

Primary Forest

Secondary Forest

Bamboo Forest

4.3.1 Floristic composition

The total number of tree species in 2 representative sample plots is 35 species belonging to 32 genera. The bamboo species in 4 representative sample plots is 14 species belonging to 6 genera. The dominant tree species is *Nephelium laurimun* Blume. (Kyet-mauk-wa) followed *by Myristica conferta* King (Kywe-thwe-khaunlong) and *M. malabarica* Lan. (Kywe-thwe-ywet-thay). The dominant bamboo species is *Oxytenanthera parvifolia* followed by *Bambusa oliverian*.

4.3.2 Tree Species Population

No.	Scientific Name	No. of individual	Total no. of individual/ha	Total no. of population/ha (%)
1	*Actinodaphne* sp.	4	31	3.361344538
2	*Alstonia rostratsa* Fischer	4	31	3.361344538
3	*Alstonia scholaris* (L.)R.Br	1	8	0.840336134

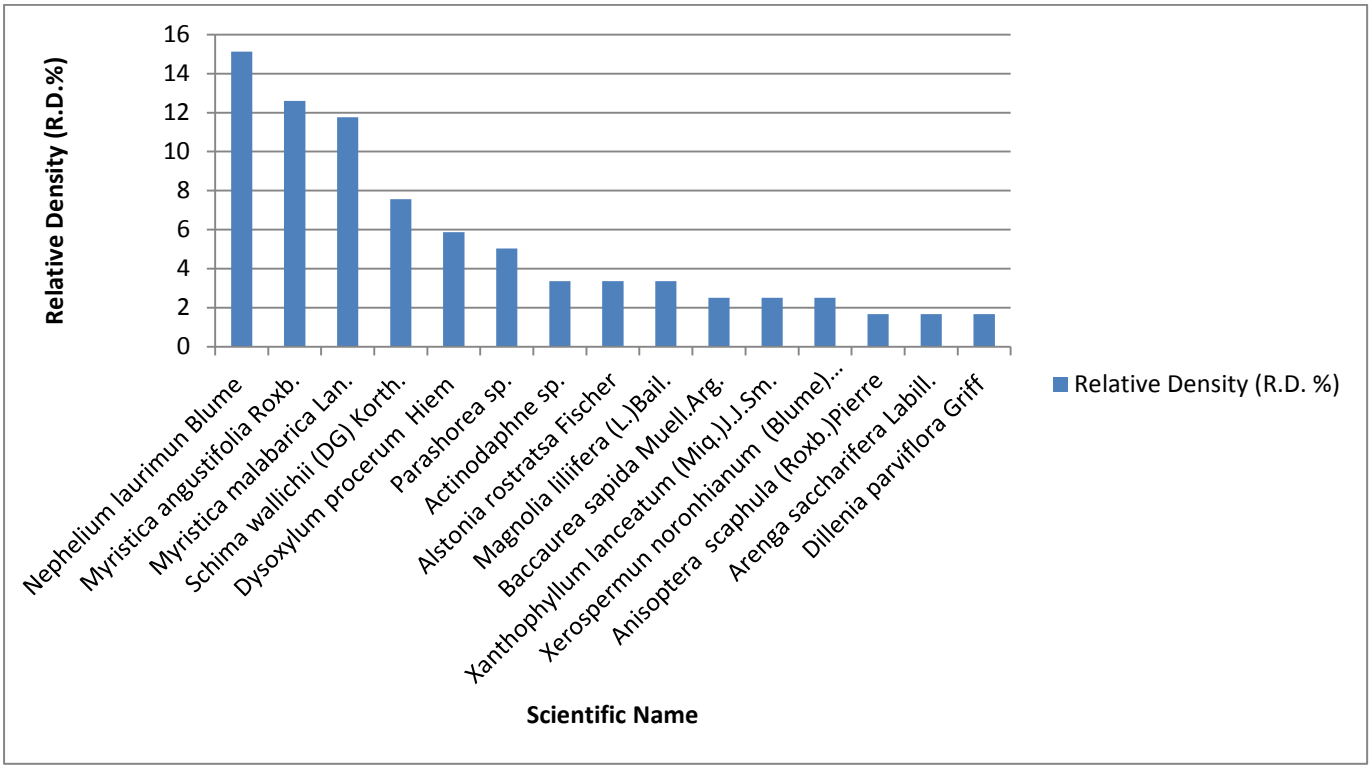
4	*Anisoptera scaphula* (Roxb.)Pierre	2	15	1.680672269
5	*Archidendron jiringa* Jack.	1	8	0.840336134
6	*Arenga saccharifera* Labill.	2	15	1.680672269
7	*Baccaurea sapida* Muell.Arg.	3	23	2.521008403
8	*Baringtonia cyosa* Fischer	1	8	0.840336134
9	*Chukrasia tabularis* A.Juss.	1	8	0.840336134
10	*Cinnamomun pachyphyllum* Kosterm.	1	8	0.840336134
11	*Dillenia parviflora* Griff	2	15	1.680672269
12	*Dysoxylum procerum*	7	54	5.882352941
13	*Eugenia* sp.(1)	1	8	0.840336134
14	*Eugenia oblate* Roxb.	2	15	1.680672269
15	*Ficus* sp.	1	8	0.840336134
16	*Gonocaryum griffithianum* (Miers)Kurz	1	8	0.840336134
17	*Ixora* sp.(1)	1	8	0.840336134
18	*Litsea grandis* (Nees)Hook.f.	2	15	1.680672269
19	*Lophopetalum fimbriatum* Wight	1	8	0.840336134
20	*Magnolia liliifera* (L.)Bail.	4	31	3.361344538
21	*Mangifera caloneura* Kurz	1	8	0.840336134
22	*Microcos paniculata* L.	1	8	0.840336134
23	*Myristica angustifolia* Roxb.	15	115	12.60504202
24	*Myristica malabarica* Lan.	14	108	11.76470588
25	*Nephelium laurimun* Blume	18	138	15.12605042
26	*Ormosia watsonii* Fisch	1	8	0.840336134
27	*Parashorea* sp.	6	46	5.042016807
28	*Parashorea stellata* Kurz	9	69	7.56302521
29	*Schima wallichii* (DG) Korth.	1	8	0.840336134
30	*Spondas pinnata* (L.) Kurz	2	15	1.680672269
31	*Syzygium* sp.	1	8	0.840336134
32	*Theobrama* sp.	1	8	0.840336134
33	*Toona ciliate* M.Roemea	1	8	0.840336134
34	*Xerospermun noronhianum* (Blume) Blume	3	23	2.521008403
35	*Xanthophyllum lanceatum* (Miq.)J.J.Sm.	3	23	2.521008403
	Total	**119**	**915**	**100**

4.3.3 Relative density

Among the sample plots species density per hectare varied and the highest density was observed *Nephelium laurimun* Blume followed by *Myristica angustifolia* Roxb. This shows that these two species are abundant in this area.

No.	**Scientific name**	**Density (D)**	**Relative Density (R.D. %)**
1	*Nephelium laurimun* Blume	9	15.12605042
2	*Myristica angustifolia* Roxb.	7.5	12.60504202
3	*Myristica malabarica* Lan.	7	11.76470588
4	*Schima wallichii* (DG) Korth.	4.5	7.56302521
5	*Dysoxylum procerum* Hiem	3.5	5.882352941
6	*Parashorea* sp.	3	5.042016807
7	*Actinodaphne* sp.	2	3.361344538
8	*Alstonia rostratsa* Fischer	2	3.361344538
9	*Magnolia liliifera* (L.)Bail.	2	3.361344538
10	*Baccaurea sapida* Muell.Arg.	1.5	2.521008403
11	*Xanthophyllum lanceatum* (Miq.)J.J.Sm.	1.5	2.521008403
12	*Xerospermun noronhianum* (Blume) Blume	1.5	2.521008403
13	*Anisoptera scaphula* (Roxb.)Pierre	1	1.680672269
14	*Arenga saccharifera* Labill.	1	1.680672269
15	*Dillenia parviflora* Griff	1	1.680672269
16	*Eugenia* sp.(1)	1	1.680672269
17	*Litsea grandis* (Nees)Hook.f.	1	1.680672269
18	*Swintonia floribunda* Griff.	1	1.680672269
19	*Alstonia scholaris* (L.)R.Br	0.5	0.840336134
20	*Archidendron jiringa* Jack.	0.5	0.840336134
21	*Baringtonia cyosa* Fischer	0.5	0.840336134
22	*Chukrasia tabularis* A.Juss.	0.5	0.840336134
23	*Cinnamomum pachyphyllum* Kosterm.	0.5	0.840336134
24	*Eugenia oblate* Roxb.	0.5	0.840336134
25	*Ficus* sp.	0.5	0.840336134
26	*Gonocaryum griffithianum* (Miers)Kurz	0.5	0.840336134
27	*Ixora* sp.(1)	0.5	0.840336134
28	*Lophopetalum fimbriatum* Wight	0.5	0.840336134
29	*Mangifera caloneura* Kurz	0.5	0.840336134
30	*Microcos paniculata* L.	0.5	0.840336134

31	*Ormosia watsonii* Fisch	0.5	0.840336134
32	*Spondas pinnata* (L.) Kurz	0.5	0.840336134
33	*Syzygium* sp.	0.5	0.840336134
34	*Theobrama* sp.	0.5	0.840336134
35	*Toona ciliate* M.Roemea	0.5	0.840336134

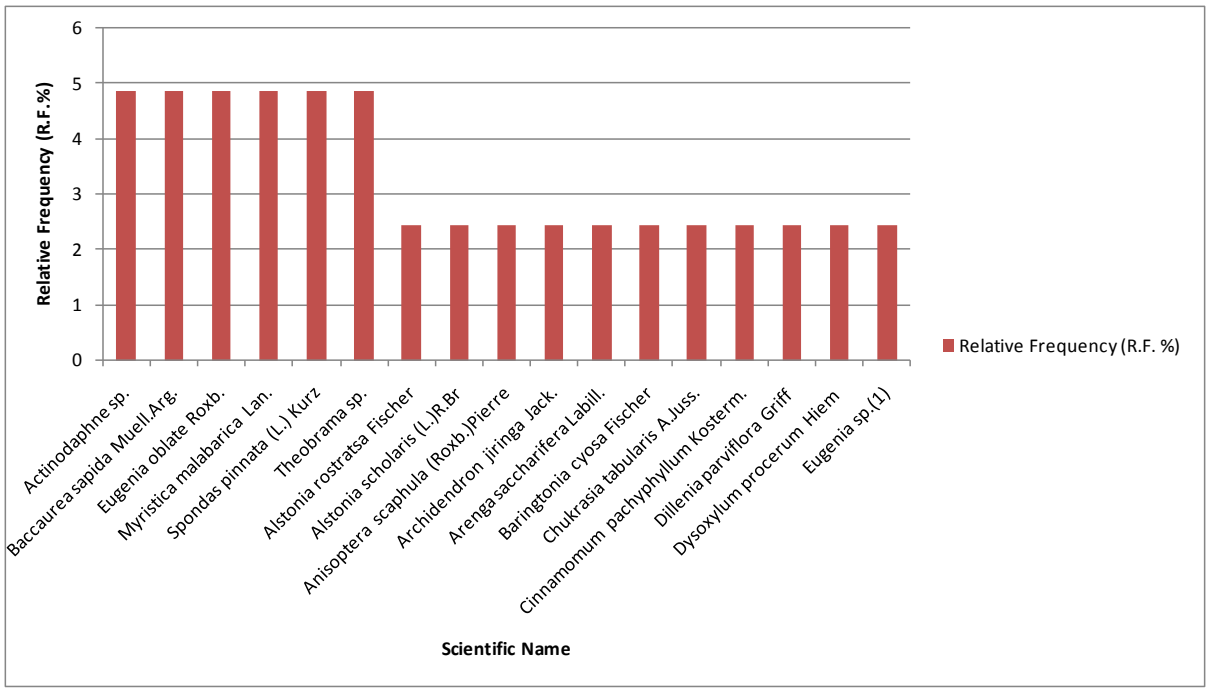


4.3.4 Relative frequency of Tree species

Relative frequency is the frequency of one species compared to the total frequency of all the species. According the results**,** *Actinodaphne* sp., *Baccaurea sapida* Muell.Arg., *Eugenia oblate* Roxb., *Myristica malabarica* Lan., *Spondas pinnata* (L.) Kurz and *Theobrama* sp. had equally high relative frequency value (4.878 %) followed by *Alstonia rostratsa* Fischer (2.4390 %), *Alstonia scholaris* (L.) R.Br (2.4390%), *Anisoptera scaphula* (Roxb.) Pierre (2.4390%), and *Archidendron jiringa* Jack. (2.4390%) respectively. Therefore these species occur everywhere in the study area.

No.	Scientific Name	Frequency (F)	Relative Frequency (R.F. %)
1	*Actinodaphne* sp.	1	4.87804878
2	*Baccaurea sapida* Muell.Arg.	0.5	4.87804878
3	*Eugenia oblate* Roxb.	0.5	4.87804878

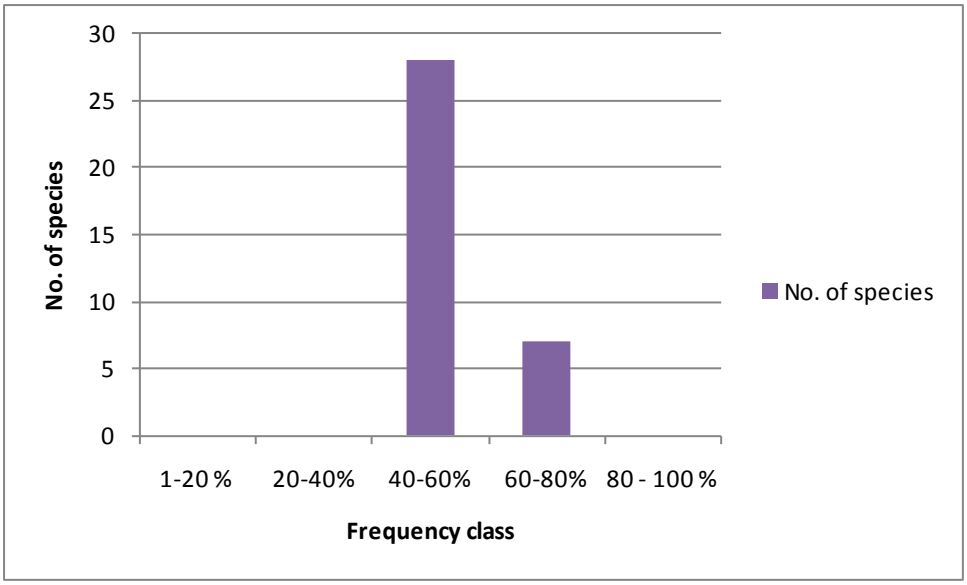
4	*Myristica malabarica* Lan.	0.5	4.87804878
5	*Spondas pinnata* (L.) Kurz	0.5	4.87804878
6	*Theobrama* sp.	0.5	4.87804878
7	*Alstonia rostratsa* Fischer	0.5	2.43902439
8	*Alstonia scholaris* (L.)R.Br	0.5	2.43902439
9	*Anisoptera scaphula* (Roxb.)Pierre	0.5	2.43902439
10	*Archidendron jiringa* Jack.	0.5	2.43902439
11	*Arenga saccharifera* Labill.	1	2.43902439
12	*Baringtonia cyosa* Fischer	0.5	2.43902439
13	*Chukrasia tabularis* A.Juss.	0.5	2.43902439
14	*Cinnamomum pachyphyllum* Kosterm.	0.5	2.43902439
15	*Dillenia parviflora* Griff	1	2.43902439
16	*Dysoxylum procerum* Hiem	0.5	2.43902439
17	*Eugenia* sp.(1)	0.5	2.43902439
18	*Ficus* sp.	0.5	2.43902439
19	*Gonocaryum griffithianum* (Miers)Kurz	0.5	2.43902439
20	*Ixora* sp.(1)	0.5	2.43902439
21	*Litsea grandis* (Nees)Hook.f.	0.5	2.43902439
22	*Lophopetalum fimbriatum* Wight	0.5	2.43902439
23	*Magnolia liliifera* (L.)Bail.	0.5	2.43902439
24	*Mangifera caloneura* Kurz	0.5	2.43902439
25	*Microcos paniculata* L.	0.5	2.43902439
26	*Myristica angustifolia* Roxb.	1	2.43902439
27	*Nephelium laurimun* Blume	0.5	2.43902439
28	*Ormosia watsonii* Fisch	0.5	2.43902439
29	*Parashorea* sp.	0.5	2.43902439
30	*Schima wallichii* (DG) Korth.	1	2.43902439
31	*Swintonia floribunda* Griff.	0.5	2.43902439
32	*Syzygium* sp.	1	2.43902439
33	*Toona ciliate* M.Roemea	0.5	2.43902439
34	*Xanthophyllum lanceatum* (Miq.)J.J.Sm.	0.5	2.43902439
35	*Xerospermun noronhianum* (Blume) Blume	1	2.43902439



4.3.5 Species distribution by frequency class

In order to clarify the homogeneity and heterogeneity of the floristic distribution in the area, the species distribution by frequency class was examined. According to the outcome of the frequency classes, only seven species are in high frequency class and 28% of the species are in intermediate frequency class. This shows that this area is floristically high degree of heterogeneity.

Frequency class	No. of species
1-20 %	0
20-40%	0
40-60%	28
60-80%	7
80 - 100 %	0



4.3.6 Vegetation types in the study area

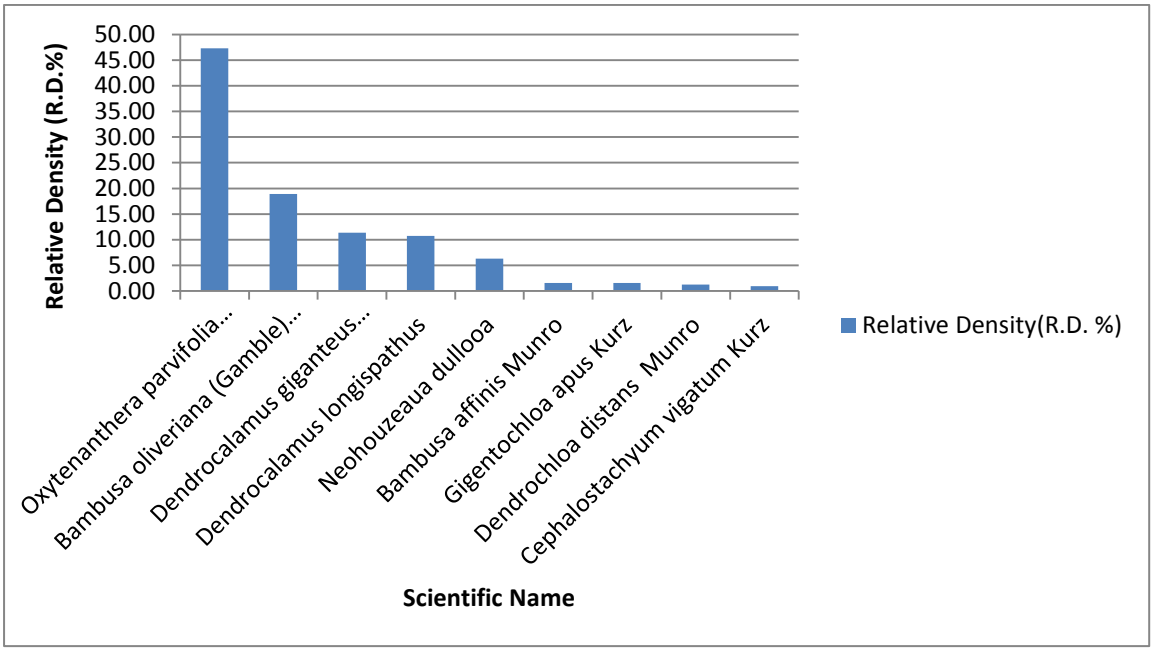
No.	Locality	Vegetation type	Latitude	Longitude	Altitude	Note
1.	Between Sepin taung and Byetgathan Chang	Semi-evergreen	N 14˚ 32' 49.4"	E 098˚ 14' 42.4"	302.7m	*Nephelium laurimun, Schima wallichii, Myristica malabarica, Syzygium* sp. *Dysoxylum procerum* & *Myristica conferta*
2.	Between Sepin taung and Byetgathan Yetagon Range	Semi-evergreen	N 14˚ 32' 40.9"	E 098˚ 14' 32.1"	333.3m	

4.3.7. Bamboo Species Population

No.	Scientific Name	No. of individual	Total no. of individual/ha	Total no. of population/ ha (%)
1	*Bambusa affinis* Munro	5	14	1.577287066
2	*Bambusa oliverian* Gamble	60	167	18.92744479
3	*Cephalostachyum vigatum* Kurz	3	8	0.94637224
4	*Dendrocalamus giganteus* Wallich ex Munro	36	100	11.35646688
5	*Dendrocalamus longispathus*	34	94	10.72555205
6	*Dendrochloa distans* Munro	4	11	1.261829653
7	*Gigentochloa apus* Kurz	5	14	1.577287066
8	*Neohouzeaua dullooa*	20	56	6.309148265
9	*Oxytenanthera parvifolia* Brandi ex Gamble	150	417	47.31861199
	Total	**317**	**881**	**100**

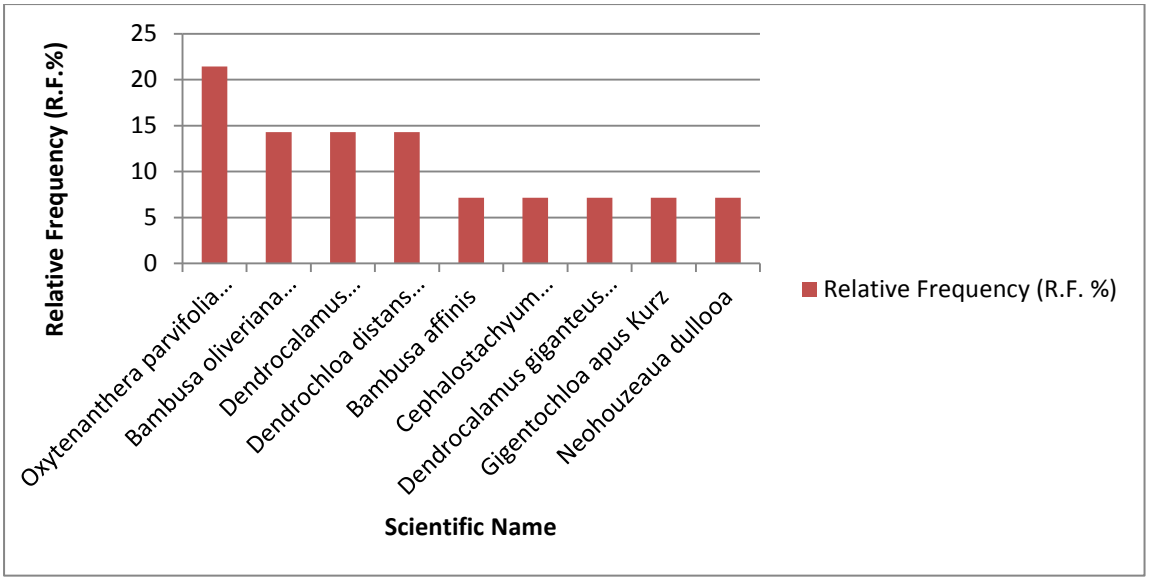
4.3.8 Relative density

No.	Scientific Name	Density (D)	Relative Density (R.D. %)
1	*Oxytenanthera parvifolia* Brandi ex Gamble	37.5	47.31861199
2	*Bambusa oliveriana* (Gamble) Munro	15	18.92744479
3	*Dendrocalamus giganteus* Wallich ex Munro	9	11.35646688
4	*Dendrocalamus longispathus*	8.5	10.72555205
5	*Neohouzeaua dullooa*	5	6.309148265
6	*Bambusa affinis* Munro	1.25	1.577287066
7	*Gigentochloa apus* Kurz	1.25	1.577287066
8	*Dendrochloa distans* Munro	1	1.261829653
9	*Cephalostachyum vigatum* Kurz	0.75	0.94637224



4.3.9 Species distribution

No.	Scientific Name	Frequency (F)	Relative Frequency (R.F. %)
1	*Oxytenanthera parvifolia* Brandi ex Gamble	0.75	21.42857143
2	*Bambusa oliveriana* (Gamble) Munro	0.5	14.28571429
3	*Dendrocalamus longispathus*	0.5	14.28571429
4	*Dendrochloa distans* Munro	0.5	14.28571429
5	*Bambusa affinis*	0.25	7.142857143
6	*Cephalostachyum vigatum* Kurz	0.25	7.142857143
7	*Dendrocalamus giganteus* Wallich ex Munro	0.25	7.142857143
8	*Gigentochloa apus* Kurz	0.25	7.142857143
9	*Neohouzeaua dullooa*	0.25	7.142857143



4.3.10 Discussion

A total of 35 species belonging to 32 genera were analyzed in the study area. The main vegetation types in this area can be grouped into three formations i.e. mixed deciduous forest, and bamboo forest. The secondary forests are also found near bamboo forest. The leading dominant species are *Nephelium laurimun, Schima wallichii, Myristica malabarica, Syzygium* sp., *Dysoxylum procerum, Nephelium laurimun and Schima wallichii* are highest in frequency so that these species are said to be common in this area. Out of 35 species, 27 species are in intermediate frequency class and 6 species are in high frequency class. Hence there is no rare species in this area. The dominant bamboo species were *Oxytenanthera parvifolia* Brandi ex Gamble and *Bambusa oliverian* Gamble and these two species are also in highest in frequency.Those species in low frequency are rare species.

The forests in this area show some types of disturbance. The canopy of the forest is more or less closed. The presence of some secondary forests shows the influence of human impacts on the forest.

4.4 Heinze area

Primary Forest

Secondary Forest

Bamboo forest

'Yoe-da-yar Road'(illegal trade to Thailand)

Illegal logging

Bamboo's raft

4.4.1 Floristic composition

The total number of tree species collected in 6 representative sample plots is 79 species belonging to 64 genera. Bamboo species were collected in 6 sample plots.The dominant tree species is *Amoora rohituka* Wight & Arn.(Gat-pok) followed by *Licuala peltata* Roxb. (Sa-lu). The dominant bamboo species among 5 collected species in 6 sample plots is *Gigentochloa apus* Kurz. and *G.nigriciliata* .

4.4.2 Tree Species Population

No.	Scientific Name	No. of individual	Total no. of individual/ha	Total no. of population/ha (%)
1	*Aglaia andamanica* Hiern	4	7	0.7752
2	*Aglaia* sp.(1)	2	4	0.3876
3	*Albizia lebbek* (L.) Benth.	3	6	0.5814
4	*Amoora rohituka* Wight & Arn.	55	102	10.6589
5	*Amoora wallichii* King	1	2	0.1938
6	*Anisoptera scaphula* (Roxb.) Pierre	1	2	0.1938
7	*Anisoptera* sp.	1	2	0.1938
8	*Anneslea fragrans* Wall.	5	9	0.9690
9	*Anthocephalus morindaefolius* Korth.	1	2	0.1938
11	*Aporosa villosula* Kurz.	1	2	0.1938
12	*Areca triandra* Roxb.	24	44	4.6512
13	*Artocarpus chaplasha* Roxb.	1	2	0.1938
14	*Barringtonia cymosa* Fischer	4	7	0.7752
15	*Bhesa robusta* (Roxb.) Ding Hou	1	2	0.1938
16	*Carallia brachiata* (Lour.)Merr.	12	22	2.3256
17	*Caryota mitis* Lour.	1	2	0.1938
18	*Chisocheton divergens* Blume.	1	2	0.1938
19	*Cinnamomum pachyphyllum* Kosterm.	4	7	0.7752
20	*Cinnamomum* sp.	2	4	0.3876
21	*Crypteronia pubescens* Blume	1	2	0.1938
22	*Dalbergia cultrata* Grah.	1	2	0.1938
23	*Dalbergia sisoo* Roxb.	25	46	4.8450
24	*Derris* sp.	9	17	1.7442
25	*Dillenia parviflora* Griff	2	4	0.3876
26	*Diospyros crumentata* Thwaites	1	2	0.1938

27	*Diospyros peregrine* (Gaertn.)Gurke	1	2	0.1938
28	*Dipterocarpus* sp.	11	20	2.1318
29	*Dysoxylum procerum* Hiern	1	2	0.1938
30	*Eugenia oblata* Roxb.	8	15	1.5504
31	*Ficus hispida* L.	1	2	0.1938
32	*Garcinia heterandra* Wall.	1	2	0.1938
33	*Garcinia merguensis* Wight	2	4	0.3876
34	*Gardenia sootepensis* Hutch.	1	2	0.1938
35	*Gluta tavoyana* Wall.	8	15	1.5504
36	*Gnetum gnemon* L.	20	37	3.8760
37	*Gonocaryum griffithianum* (Miers)Kurz	1	2	0.1938
38	*Harpullia cupanioides Roxb.*	3	6	0.5814
39	*Hibiscus macrophyllus*	1	2	0.1938
40	*Homalium grandiflorum* Benth.	13	24	2.5194
41	*Hopea helferi* (Dyer) Brandis	1	2	0.1938
42	*Irvingia malayana*	2	4	0.3876
43	*Knema erratica*	8	15	1.5504
44	*Lagerstroemia floribunda* Jack	1	2	0.1938
45	*Lannea coromandelica* (Houtt.)Merr.	1	2	0.1938
46	*Licuala peltata* Roxb.	33	61	6.3953
47	*Lithocarpus elegans* (Blume) Hatusima ex Saepadma	4	7	0.7752
48	*Mangifera caloneura* Kurz	4	7	0.7752
49	*Mesua nervosa* L.	4	7	0.7752
50	*Mitragyna parvifolia* (Roxb.) Korth.	2	4	0.3876
51	*Myristica angustifolia* Roxb.	4	7	0.7752
52	*Myristica conferta* King	3	6	0.5814
53	*Nauclea sessilifolia* Roxb.	5	9	0.9690
54	*Nephelium* sp.	24	44	4.6512
55	*Ormosia watsonii* Fisch	3	6	0.5814
56	*Palaquium obovatum* (Griff.) Engl.	1	2	0.1938
57	*Parkia leiophylla* Kurz	1	2	0.1938
58	*Pavetta indica* L.	12	22	2.3256
59	*Payena oleifera* Watt.	1	2	0.1938

60	*Payena paralleloneura* Kurz	3	6	0.5814
61	*Pentace griffithii* King	14	26	2.7132
62	*Phoebe lanceolata* (Nees) Nees	1	2	0.1938
63	*Phoebe* sp.	16	30	3.1008
64	*Phoebe tavoyana* (Meissner) Hook.F.	1	2	0.1938
65	*Rothmannia sootepensis*	1	2	0.1938
66	*Salacca wallichiana* Mart.	18	33	3.4884
67	*Shorea henryana* Pierre	1	2	0.1938
68	*Spondias pinnata* (L.)Kurz.	1	2	0.1938
69	*Suregada multiflora*	5	9	0.9690
70	*Swintonia floribunda* Griff.	37	69	7.1705
71	*Syzygium buxifolium* Hook. & Arn.	5	9	0.9690
72	*Syzygium claviflorum* (Roxb.)A.M.Cowan &Cowan	20	37	3.8760
73	*Syzygium gratum*(Wight)S.N.Mitra	2	4	0.3876
74	*Syzygium* sp.(2)	13	24	2.5194
75	*Terminalia bellerica* Roxb.	1	2	0.1938
76	*Theobroma* sp.	13	24	2.5194
77	*Vitex peduncularis* Wall.	5	9	0.9690
78	*Wrightia arborea* (Dennst.) Mabb.	9	17	1.7442
79	*Xerospermum noronhianum* (Blume)Blume	1	2	0.1938
	Total	**516**	**956**	**100**

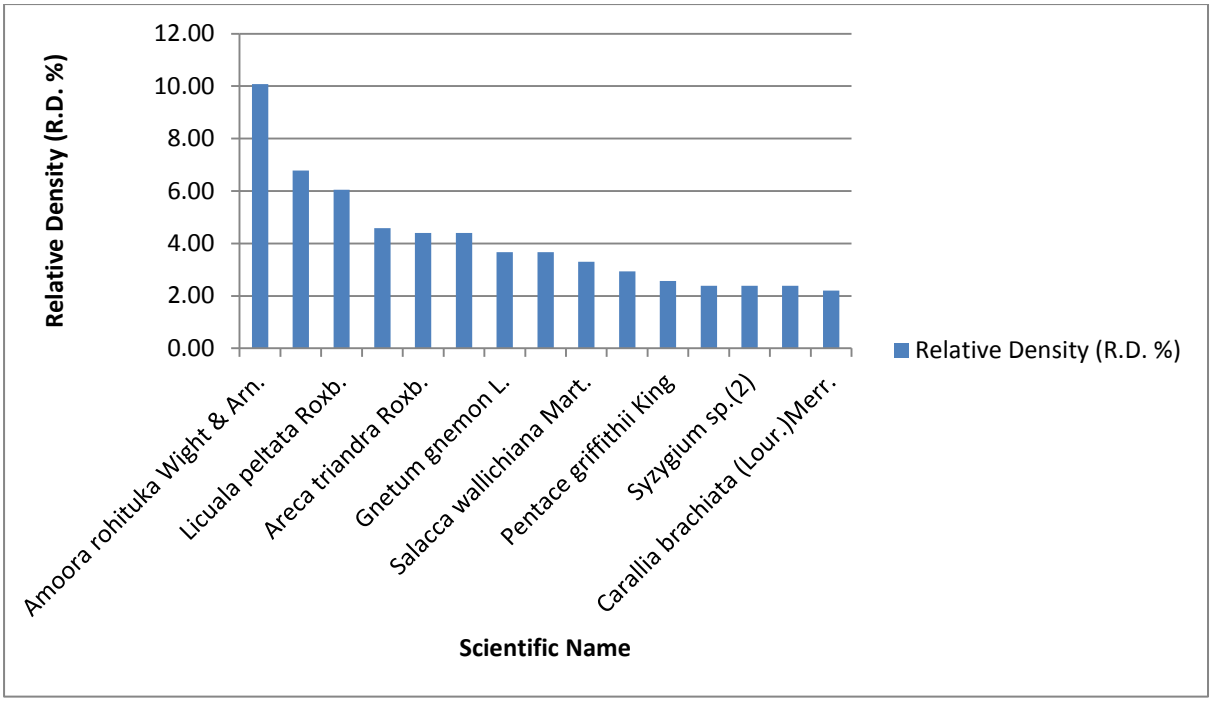
4.4.3 Relative density

Among the sample plots species density per hectare varied and the highest density was observed *Amoora rohituka* Wight & Arn. followed by *Swintonia floribunda* Griff.. This shows that these two species are abundant in this area.

No.	Scientific name	Density (D)	Relative Density (R.D. %)
1	*Amoora rohituka* Wight & Arn.	9.166666667	10.07326007
2	*Swintonia floribunda* Griff.	6.166666667	6.776556777
3	*Licuala peltata* Roxb.	5.5	6.043956044
4	*Dalbergia sisoo* Roxb.	4.166666667	4.578754579
5	*Areca triandra* Roxb.	4	4.395604396
6	*Nephelium* sp.	4	4.395604396

7	*Gnetum gnemon* L.	3.333333333	3.663003663
8	*Syzygium claviflorum* (Roxb.)A.M.Cowan &Cowan	3.333333333	3.663003663
9	*Salacca wallichiana* Mart.	3	3.296703297
11	*Phoebe* sp.	2.666666667	2.93040293
12	*Pentace griffithii* King	2.333333333	2.564102564
13	*Homalium grandiflorum* Benth.	2.166666667	2.380952381
14	*Syzygium* sp.(2)	2.166666667	2.380952381
15	*Theobroma* sp.	2.166666667	2.380952381
16	*Carallia brachiata* (Lour.)Merr.	2	2.197802198
17	*Pavetta indica* L.	2	2.197802198
18	*Dipterocarpus* sp.	1.833333333	2.014652015
19	*Derris* sp.	1.5	1.648351648
20	*Wrightia arborea* (Dennst.) Mabb.	1.5	1.648351648
21	*Eugenia oblata* Roxb.	1.333333333	1.465201465
22	*Gluta tavoyana* Wall.	1.333333333	1.465201465
23	*Knema erratica*	1.333333333	1.465201465
24	*Anneslea fragrans* Wall.	0.833333333	0.915750916
25	*Nauclea sessilifolia* Roxb.	0.833333333	0.915750916
26	*Suregada multiflora*	0.833333333	0.915750916
27	*Syzygium buxifolium* Hook. & Arn.	0.833333333	0.915750916
28	*Vitex peduncularis* Wall.	0.833333333	0.915750916
29	*Aglaia andamanica* Hiern	0.666666667	0.732600733
30	*Barringtonia cymosa* Fischer	0.666666667	0.732600733
31	*Cinnamomum pachyphyllum* Kosterm.	0.666666667	0.732600733
32	*Lithocarpus elegans* (Blume) Hatusima ex Saepadma	0.666666667	0.732600733
33	*Mangifera caloneura* Kurz	0.666666667	0.732600733
34	*Mesua nervosa* L.	0.666666667	0.732600733
35	*Myristica angustifolia* Roxb.	0.666666667	0.732600733
36	*Albizia lebbek* (L.) Benth.	0.5	0.549450549
37	*Harpullia cupanioides Roxb.*	0.5	0.549450549
38	*Myristica conferta* King	0.5	0.549450549
39	*Ormosia watsonii* Fisch	0.5	0.549450549
40	*Payena paralleloneura* Kurz	0.5	0.549450549
41	*Aglaia* sp.(1)	0.333333333	0.366300366
42	*Cinnamomum* sp.	0.333333333	0.366300366
43	*Dillenia parviflora* Griff	0.333333333	0.366300366

44	*Garcinia merguensis* Wight	0.333333333	0.366300366
45	*Irvingia malayana*	0.333333333	0.366300366
46	*Mitragyna parvifolia* (Roxb.) Korth.	0.333333333	0.366300366
47	*Syzygium gratum*(Wight)S.N.Mitra	0.333333333	0.366300366
48	*Amoora wallichii* King	0.166666667	0.183150183
49	*Anisoptera scaphula* (Roxb.) Pierre	0.166666667	0.183150183
50	*Anisoptera* sp.	0.166666667	0.183150183
51	*Anthocephalus morindaefolius* Korth.	0.166666667	0.183150183
52	*Aporosa villosula* Kurz.	0.166666667	0.183150183
53	*Artocarpus chaplasha* Roxb.	0.166666667	0.183150183
54	*Bhesa robusta* (Roxb.) Ding Hou	0.166666667	0.183150183
55	*Caryota mitis* Lour.	0.166666667	0.183150183
56	*Chisocheton divergens* Blume.	0.166666667	0.183150183
57	*Crypteronia pubescens* Blume	0.166666667	0.183150183
58	*Dalbergia cultrata* Grah.	0.166666667	0.183150183
59	*Diospyros crumentata* Thwaites	0.166666667	0.183150183
60	*Diospyros peregrine* (Gaertn.)Gurke	0.166666667	0.183150183
61	*Dysoxylum procerum* Hiern	0.166666667	0.183150183
62	*Ficus hispida* L.	0.166666667	0.183150183
63	*Garcinia heterandra* Wall.	0.166666667	0.183150183
64	*Gardenia sootepensis* Hutch.	0.166666667	0.183150183
65	*Gonocaryum griffithianum* (Miers)Kurz	0.166666667	0.183150183
66	*Hibiscus macrophyllus*	0.166666667	0.183150183
67	*Hopea helferi* (Dyer) Brandis	0.166666667	0.183150183
68	*Lagerstroemia floribunda* Jack	0.166666667	0.183150183
69	*Lannea coromandelica* (Houtt.)Merr.	0.166666667	0.183150183
70	*Palaquium obovatum* (Griff.) Engl.	0.166666667	0.183150183
71	*Parkia leiophylla* Kurz	0.166666667	0.183150183
72	*Payena oleifera* Watt.	0.166666667	0.183150183
73	*Phoebe lanceolata* (Nees) Nees	0.166666667	0.183150183
74	*Phoebe tavoyana* (Meissner) Hook.F.	0.166666667	0.183150183
75	*Rothmannia sootepensis*	0.166666667	0.183150183
76	*Shorea henryana* Pierre	0.166666667	0.183150183
77	*Spondias pinnata* (L.)Kurz.	0.166666667	0.183150183
78	*Terminalia bellerica* Roxb.	0.166666667	0.183150183
79	*Xerospermum noronhianum* (Blume)Blume	0.166666667	0.183150183



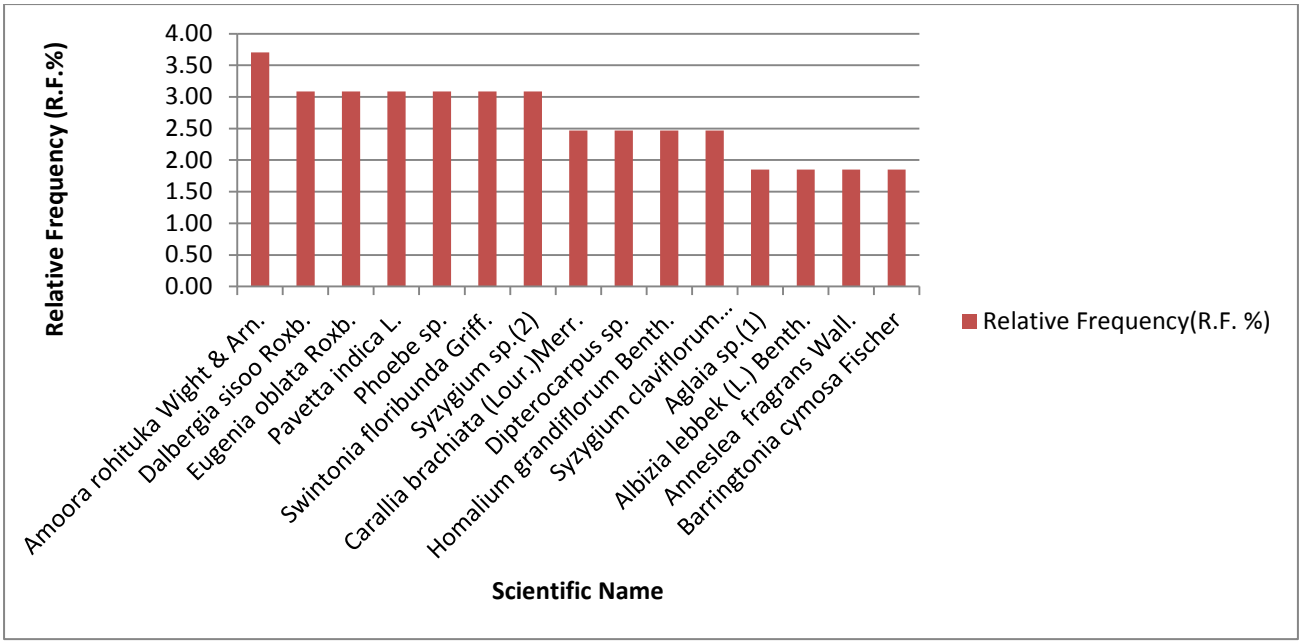
4.4.4 Relative frequency of Tree species

Relative frequency is the frequency of one species compared to the total frequency of all the species. According the results**,** *Amoora rohituka* Wight & Arn. had high relative frequency value (3.773 %) followed by *Dalbergia sisoo* Roxb. (3.144%), *Eugenia oblata* Roxb. (3.144%), *Pavetta indica* L. (3.144%) and *Phoebe* sp. (3.144%) and *Swintonia floribunda* Griff. (3.144%) respectively. Therefore these species occur everywhere in the study area.

No.	Scientific Name	Frequency (F)	Relative Frequency (R.F. %)
1	*Amoora rohituka* Wight & Arn.	1	3.773584906
2	*Dalbergia sisoo* Roxb.	0.833333333	3.144654088
3	*Eugenia oblata* Roxb.	0.833333333	3.144654088
4	*Pavetta indica* L.	0.833333333	3.144654088
5	*Phoebe* sp.	0.833333333	3.144654088
6	*Swintonia floribunda* Griff.	0.833333333	3.144654088
7	*Syzygium* sp.(2)	0.833333333	3.144654088
8	*Carallia brachiata* (Lour.)Merr.	0.666666667	2.51572327
9	*Dipterocarpus* sp.	0.666666667	2.51572327
11	*Homalium grandiflorum* Benth.	0.666666667	2.51572327
12	*Syzygium claviflorum* (Roxb.)A.M.Cowan &Cowan	0.666666667	2.51572327
13	*Aglaia* sp.(1)	0.5	1.886792453
14	*Albizia lebbek* (L.) Benth.	0.5	1.886792453

15	*Anneslea fragrans* Wall.	0.5	1.886792453
16	*Barringtonia cymosa* Fischer	0.5	1.886792453
17	*Gluta tavoyana* Wall.	0.5	1.886792453
18	*Licuala peltata* Roxb.	0.5	1.886792453
19	*Mangifera caloneura* Kurz	0.5	1.886792453
20	*Mesua nervosa* L.	0.5	1.886792453
21	*Myristica angustifolia* Roxb.	0.5	1.886792453
22	*Nauclea sessilifolia* Roxb.	0.5	1.886792453
23	*Nephelium* sp.	0.5	1.886792453
24	*Syzygium buxifolium* Hook. & Arn.	0.5	1.886792453
25	*Theobroma* sp.	0.5	1.886792453
26	*Aporosa villosula* Kurz.	0.333333333	1.257861635
27	*Cinnamomum pachyphyllum* Kosterm.	0.333333333	1.257861635
28	*Cinnamomum* sp.	0.333333333	1.257861635
29	*Dillenia parviflora* Griff	0.333333333	1.257861635
30	*Harpullia cupanioides Roxb.*	0.333333333	1.257861635
31	*Knema erratica*	0.333333333	1.257861635
32	*Myristica conferta* King	0.333333333	1.257861635
33	*Ormosia watsonii* Fisch	0.333333333	1.257861635
34	*Payena paralleloneura* Kurz	0.333333333	1.257861635
35	*Pentace griffithii* King	0.333333333	1.257861635
36	*Syzygium gratum*(Wight)S.N.Mitra	0.333333333	1.257861635
37	*Xerospermum noronhianum* (Blume)Blume	0.333333333	1.257861635
38	*Aglaia andamanica* Hiern	0.166666667	0.628930818
39	*Amoora wallichii* King	0.166666667	0.628930818
40	*Anisoptera scaphula* (Roxb.) Pierre	0.166666667	0.628930818
41	*Anisoptera* sp.	0.166666667	0.628930818
42	*Anthocephalus morindaefolius* Korth.	0.166666667	0.628930818
43	*Areca triandra* Roxb.	0.166666667	0.628930818
44	*Artocarpus chaplasha* Roxb.	0.166666667	0.628930818
45	*Bhesa robusta* (Roxb.) Ding Hou	0.166666667	0.628930818
46	*Caryota mitis* Lour.	0.166666667	0.628930818
47	*Chisocheton divergens* Blume.	0.166666667	0.628930818
48	*Crypteronia pubescens* Blume	0.166666667	0.628930818
49	*Dalbergia cultrata* Grah.	0.166666667	0.628930818
50	*Derris* sp.	0.166666667	0.628930818

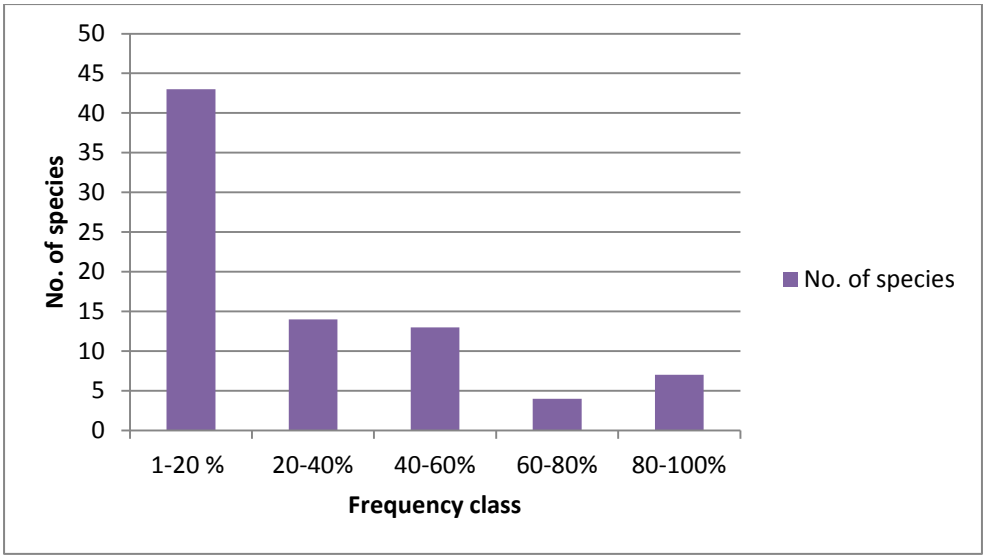
51	*Diospyros crumentata* Thwaites	0.166666667	0.628930818
52	*Diospyros peregrine* (Gaertn.)Gurke	0.166666667	0.628930818
53	*Dysoxylum procerum* Hiern	0.166666667	0.628930818
54	*Ficus hispida* L.	0.166666667	0.628930818
55	*Garcinia heterandra* Wall.	0.166666667	0.628930818
56	*Garcinia merguensis* Wight	0.166666667	0.628930818
57	*Gardenia sootepensis* Hutch.	0.166666667	0.628930818
58	*Gnetum gnemon* L.	0.166666667	0.628930818
59	*Gonocaryum griffithianum* (Miers)Kurz	0.166666667	0.628930818
60	*Hibiscus macrophyllus*	0.166666667	0.628930818
61	*Hopea helferi* (Dyer) Brandis	0.166666667	0.628930818
62	*Irvingia malayana*	0.166666667	0.628930818
63	*Lagerstroemia floribunda* Jack	0.166666667	0.628930818
64	*Lannea coromandelica* (Houtt.)Merr.	0.166666667	0.628930818
65	*Lithocarpus elegans* (Blume) Hatusima ex Saepadma	0.166666667	0.628930818
66	*Mitragyna parvifolia* (Roxb.) Korth.	0.166666667	0.628930818
67	*Palaquium obovatum* (Griff.) Engl.	0.166666667	0.628930818
68	*Parkia leiophylla* Kurz	0.166666667	0.628930818
69	*Payena oleifera* Watt.	0.166666667	0.628930818
70	*Phoebe lanceolata* (Nees) Nees	0.166666667	0.628930818
71	*Phoebe tavoyana* (Meissner) Hook.F.	0.166666667	0.628930818
72	*Rothmannia sootepensis*	0.166666667	0.628930818
73	*Salacca wallichiana* Mart.	0.166666667	0.628930818
74	*Shorea henryana* Pierre	0.166666667	0.628930818
75	*Spondias pinnata* (L.)Kurz.	0.166666667	0.628930818
76	*Suregada multiflora*	0.166666667	0.628930818
77	*Terminalia bellerica* Roxb.	0.166666667	0.628930818
78	*Vitex peduncularis* Wall.	0.166666667	0.628930818
79	*Wrightia arborea* (Dennst.) Mabb.	0.166666667	0.628930818



4.4.5 Species distribution by frequency class

In order to clarify the homogeneity and heterogeneity of the floristic distribution in the area, the species distribution by frequency class was examined. According to the outcome of the frequency classes, only eleven species are in high frequency class and 57% of the species are in intermediate frequency class. This shows that this area is floristically heterogeneous.

Frequency class	No. of species
1-20 %	43
20-40%	14
40-60%	13
60-80%	4
80-100%	7



4.4.6 Vegetation types in the area

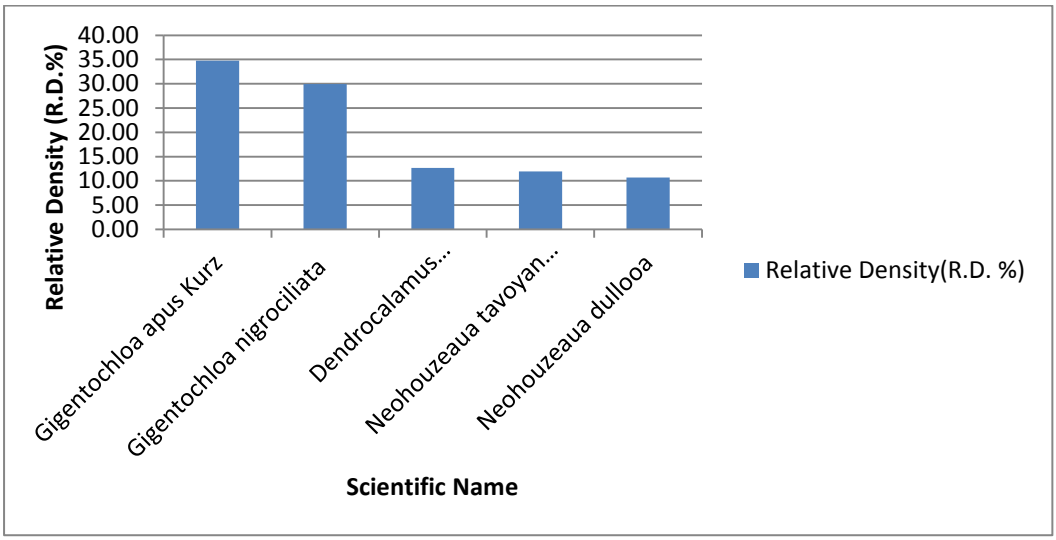
No.	Locality	Vegetation type	Latitude	Longitude	Altitude	Note
1.	Near junction of Heinze and Pharkya Streams	Deciduous, Riverine	N 14˚ 25' 78.4"	E 098˚ 17' 87.8"	217m	*Licuala peltata, Areca triandra, Gnetum gnemon, Amoora rohituka, Salacca wallichiana, Swintonia floribunda, Aporosa villosula, Xerospermum noronhianum, Gluta tavoyana,Swintonia floribunda, Theobroma* sp.
2.	The mountain range near Tadarkyo Stream	Deciduous, Riverine	N 14˚ 26' 29.1"	E 098˚ 17' 18.0"	234m	
3.	Eastern side of Ponnalo Stream	Deciduous, Riverine	N 14˚ 26' 30.5"	E 098˚ 16' 68.7"	261m	
4.	Eastern side of Ponnalo Stream	Riverine	N 14˚ 26' 33.1"	E 098˚ 16' 65.5"	260m	*Dalbergia sisoo, Amoora rohituka, Wrightia arborea, Derris* sp., *Aporosa roxburghii, Swintonia floribunda,*
5.	Near Kyaukkyan Stream	Riverine	N 14˚ 27' 29.2"	E 098˚ 15' 30.0"	231m	
6.	Between Byinpepin and Ponnalo streams	Deciduous	N 14˚ 26' 56.8"	E 098˚ 16' 09.7"	343m	*Amoora rohituka, Licuala peltata, Dipterocarpus* sp.

4.4.7 Bamboo Species Population

No.	Scientific Name	No. of individual	Total no. of individual/ ha	Total no. of population/ ha (%)
1	*Dendrocalamus membranceus* Munro	50	114	12.69035533
2	*Gigentochloa apus* Kurz	137	311	34.7715736
3	*Gigentochloa nigrociliata*	118	268	29.94923858
4	*Neohouzeaua dullooa*	42	95	10.65989848
5	*Neohouzeaua tavoyan* (Gamble) Munro	47	107	11.92893401
	Total	**394**	**895**	**100**

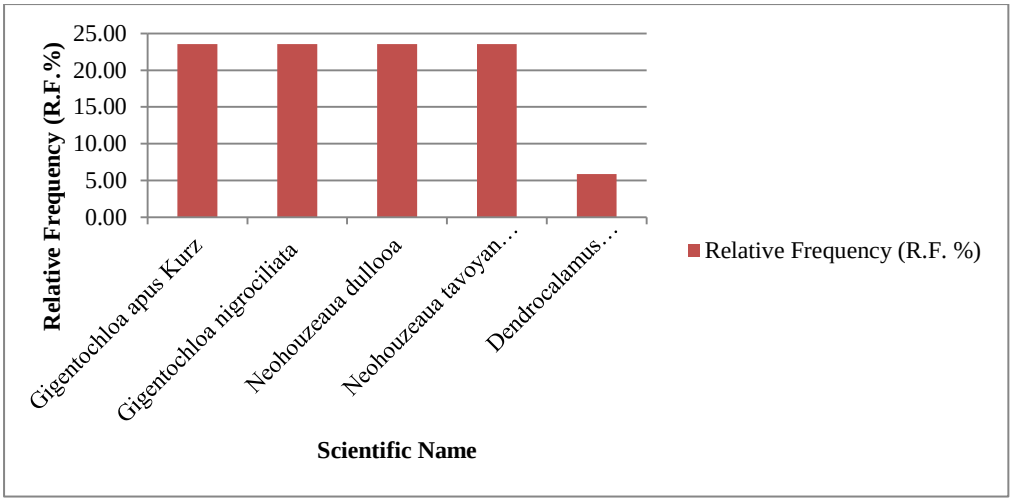
4.4.8 Relative density

No.	Scientific Name	Density (D)	Relative Density (R.D. %)
1	*Gigentochloa apus* Kurz	22.83333333	34.7715736
2	*Gigentochloa nigrociliata*	19.66666667	29.94923858
3	*Dendrocalamus membranceus* Munro	8.333333333	12.69035533
4	*Neohouzeaua tavoyan* (Gamble) Munro	7.833333333	11.92893401
5	*Neohouzeaua dullooa*	7	10.65989848



4.4.9 Species distribution

No.	Scientific Name	Frequency (F)	Relative Frequency (R.F. %)
1	*Gigentochloa apus* Kurz	0.666666667	23.52941176
2	*Gigentochloa nigrociliata*	0.666666667	23.52941176
3	*Neohouzeaua dullooa*	0.666666667	23.52941176
4	*Neohouzeaua tavoyan* (Gamble) Munro	0.666666667	23.52941176
5	*Dendrocalamus membranceus* Munro	0.166666667	5.882352941



4.4.10 Discussion

A total of 79 species belonging to 64 genera were analyzed in the study area. The main vegetation types in this area can be grouped into three formations i.e. deciduous forest, riverine forest and bamboo forest. The secondary forests are also found near bamboo forest. The leading dominant species are *Licuala peltata, Areca triandra, Gnetum gnemon, Amoora rohituka, Dalbergia sisoo, Amoora rohituka*, *Dipterocarpus* sp *Licuala peltata* and *Areca triandra,* are highest in frequency so that these species are said to be common in this area. Out of 79 species 57 species are in low frequency class. Hence these species are said to be rare species in this area. The dominant bamboo species were *Gigentochloa apus* Kurz *Gigentochloa nigrociliata* and these two species are also in highest in frequency. *Dendro clamus* sp. which is in low frequency is the rare species.

The forests in this area show some types of disturbance. The illegal logging is apparent in these areas (see photo). The illegal trade route called Yoe-da-yar-lan was existing and the illegal human trade and cattle trade is practicing along this road. The illegal traders burn the bamboo forest to get new sprouts for their cattles in next trip.

The canopy of the forest is more or less opened. The presence of some secondary forests shows the influence of human impacts on the forest.

4.5. Nhankye area

Primary Forest

Secondary Forest

Bamboo Forest

4.5.1 Floristic composition

The total number of tree species in this area collected in 7 respresentative sample plots is 88 species belonging to 64 genera. The dominant tree species are *Licuala peltata* Roxb. (Sa-lu), *Swintonia floribunda* Griff.(Shit-lae) and *Theobroma* sp.(Thit-me). Bamboos are rare in this area and are located as small patches. Only two species are found in one sample plot and *Bambusa* Sp. is dominant in this area.

4.5.2 Tree Species Population

No.	Scientific Name	No. of individual	Total no. of individual /ha	Total no. of population /ha (%)
1	*Actinodaphne* sp.(2)	1	2	0.137174211
2	*Amoora rohituka* Wight & Arn.	28	48	3.840877915
3	*Amoora* sp.	1	2	0.137174211
4	*Amoora wallichii* King	3	5	0.411522634
5	*Anisoptera costata* Korth.	3	5	0.411522634
6	*Anisoptera oblonga* Dyer	1	2	0.137174211
7	*Anisoptera scaphula* (Roxb.) Pierre	9	16	1.234567901
8	*Anisoptera* sp.	3	5	0.411522634
9	*Vaccinium donianum* Wight.	1	2	0.137174211
10	*Aporusa dioica* (Roxb.) Mull.Arg.	27	47	3.703703704
11	*Archidendron jiringa*(Jack)Nielsen	6	10	0.823045267
12	*Ardisia colorata* Roxb.	1	2	0.137174211
13	*Areca triandra* Roxb.	1	2	0.137174211
14	*Artocarpus chaplasha* Roxb.	1	2	0.137174211
15	*Artocarpus lakoocha* Roxb.	1	2	0.137174211
16	*Baccaurea sapida* Muell.Arg.	3	5	0.411522634
17	*Barringtonia cymosa* Fischer	6	10	0.823045267
18	*Buchanania lanzan* Spreng.	4	7	0.548696845
19	*Carallia brachiata* (Lour.)Merr.	14	24	1.920438957
20	*Castanopsis* sp.	20	34	2.743484225
21	*Chaetocarpus castanocarpus* Thwaites	2	3	0.274348422
22	*Chisocheton divergens* Blume.	1	2	0.137174211
23	*Chukrasia tabularis* A.Juss.	1	2	0.137174211
24	*Cinnamomum pachyphyllum* Kosterm.	3	5	0.411522634
25	*Cinnamomum pachyphyllum* Kosterm.	1	2	0.137174211
26	*Cratoxylum neriifolium* Kurz.	1	2	0.137174211
27	*Cycas pectinata* Buch.-ham.	3	5	0.411522634
28	*Dillenia parviflora* Griff	4	7	0.548696845

29	*Diospyros crumentata* Thwaites	4	7	0.548696845
30	*Diospyros dictyoneura* Hiern.	4	7	0.548696845
31	*Diospyros peregrine* (Gaertn.)Gurke	6	10	0.823045267
32	*Dipterocarpus turbinatus*	3	5	0.411522634
33	*Dipterocarpus grandiflorus* Blanco	7	12	0.960219479
34	*Dipterocarpus* sp.	4	7	0.548696845
35	*Dysoxylum* sp.	2	3	0.274348422
36	*Engelhardtia spicata* Blume	1	2	0.137174211
37	*Erythrina suberosa* Roxb.	1	2	0.137174211
38	*Eugenia oblata* Roxb.	13	22	1.783264746
39	*Eugenia* sp.(1)	14	24	1.920438957
40	*Ficus glomerata* Roxb.	1	2	0.137174211
41	*Firmiana colorata* (Roxb.) R.Br.	2	3	0.274348422
42	*Garcinia merguensis* Wight	6	10	0.823045267
43	*Garcinia speciosa* Kurz	3	5	0.411522634
44	*Glochidion rubrum*	1	2	0.137174211
45	*Gluta tavoyana* Wall.	8	14	1.09739369
46	*Homalium grandiflorum* Benth.	5	9	0.685871056
47	*Hopea sangal* Korth.	1	2	0.137174211
48	*Knema erratica*	28	48	3.840877915
49	*Licuala peltata* Roxb.	98	169	13.4430727
50	*Lithocarpus sootepensis*	2	3	0.274348422
51	*Maesa paniculata* A.DC.	2	3	0.274348422
52	*Magnolia liliifera* (L.)Bail.	1	2	0.137174211
53	*Mangifera sylvatica* Roxb	3	5	0.411522634
54	*Mesua nervosa* L.	3	5	0.411522634
55	*Myristica malabarica* Lan.	2	3	0.274348422
56	*Myristica* sp.	1	2	0.137174211
57	*Nauclea sessilifolia* Roxb.	16	28	2.19478738
58	*Nephelium* sp.	3	5	0.411522634
59	*Ormosia watsonii* Fisch	12	21	1.646090535
60	*Pavetta indica* L.	7	12	0.960219479

61	*Payena oleifera* Watt.	2	3	0.274348422
62	*Payena paralleloneura* Kurz	3	5	0.411522634
63	*Pentace griffithii* King	32	55	4.38957476
64	*Phoebe* sp.	16	28	2.19478738
65	*Phoebe tavoyana* (Meissner) Hook.F.	1	2	0.137174211
66	*Polyalthia hookeriana* King	17	29	2.331961591
67	*Pterospermum semisagittatum* Buch-Ham	1	2	0.137174211
68	*Salacca wallichiana* Mart.	2	3	0.274348422
69	*Sapium baccatum* Roxb.	1	2	0.137174211
70	*Sapium indicum* Willd.	7	12	0.960219479
71	Shitshoshitpyit	3	5	0.411522634
72	*Shorea cinerea* Fischer	13	22	1.783264746
73	*Shorea* sp.	22	38	3.017832647
74	*Spondias pinnata* (L.)Kurz.	1	2	0.137174211
75	*Streblus asper* Lour.	8	14	1.09739369
76	*Swintonia floribunda* Griff.	68	117	9.327846365
77	*Syzygium buxifolium* Hook. & Arn.	10	17	1.371742112
78	*Syzygium claviflorum* (Roxb.)A.M.Cowan &Cowan	4	7	0.548696845
79	*Syzygium grande* (Wight)Walp	2	3	0.274348422
80	*Syzygium gratum*(Wight)S.N.Mitra	7	12	0.960219479
81	*Syzygium* sp.(1)	1	2	0.137174211
82	*Syzygium* sp.(2)	17	29	2.331961591
83	*Taliparitimacrophyllum* (Roxb. ex Hornem.) Fryxell	4	7	0.548696845
84	*Tamarindus indica* L.	1	2	0.137174211
85	*Terminalia catappa* L.	2	3	0.274348422
86	*Tetrameles nudiflora* R.Br.	1	2	0.137174211
87	*Theobroma* sp.	66	114	9.053497942
88	*Xerospermum noronhianum* (Blume)Blume	3	5	0.411522634
	Total	**729**	**1257**	**100**

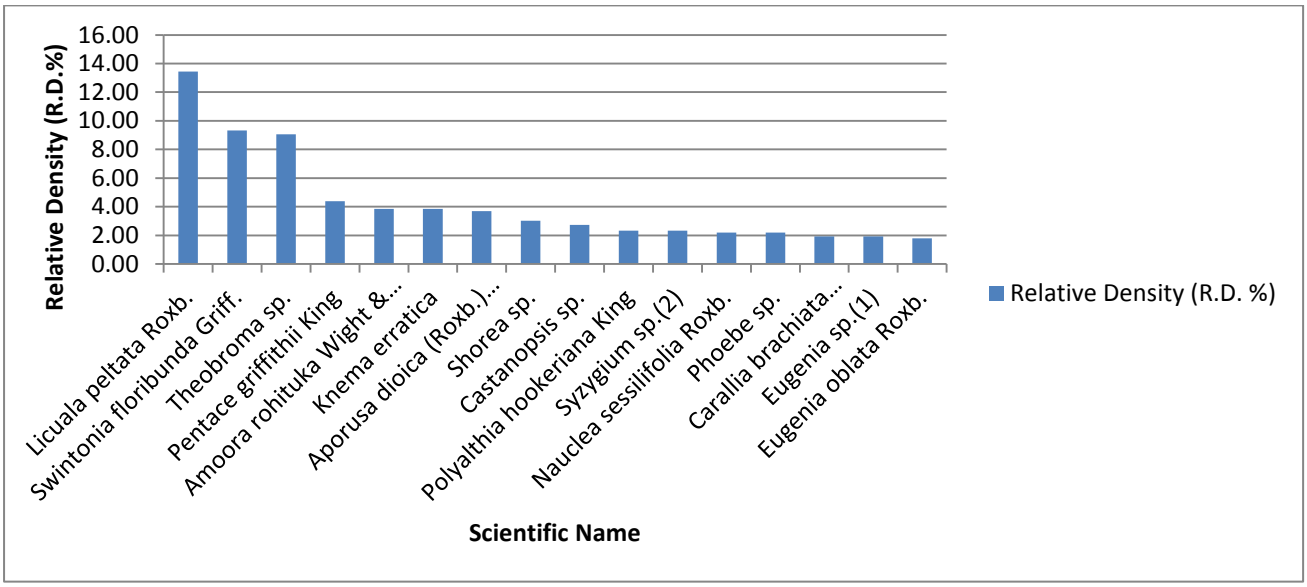
4.5.3 Relative density

Among the sample plots species density per hectare varied and the highest density was observed *Licuala peltata* Roxb. followed by *Swintonia floribunda* Griff.. This shows that these two species are abundant in this area.

No.	Scientific name	Density (D)	Relative Density (R.D. %)
1	*Licuala peltata* Roxb.	14	13.4430727
2	*Swintonia floribunda* Griff.	9.714285714	9.327846365
3	*Theobroma* sp.	9.428571429	9.053497942
4	*Pentace griffithii* King	4.571428571	4.38957476
5	*Amoora rohituka* Wight & Arn.	4	3.840877915
6	*Knema erratica*	4	3.840877915
7	*Aporusa dioica* (Roxb.) Mull.Arg.	3.857142857	3.703703704
8	*Shorea* sp.	3.142857143	3.017832647
9	*Castanopsis* sp.	2.857142857	2.743484225
10	*Polyalthia hookeriana* King	2.428571429	2.331961591
11	*Syzygium* sp.(2)	2.428571429	2.331961591
12	*Nauclea sessilifolia* Roxb.	2.285714286	2.19478738
13	*Phoebe* sp.	2.285714286	2.19478738
14	*Carallia brachiata* (Lour.)Merr.	2	1.920438957
15	*Eugenia* sp.(1)	2	1.920438957
16	*Eugenia oblata* Roxb.	1.857142857	1.783264746
17	*Shorea cinerea* Fischer	1.857142857	1.783264746
18	*Ormosia watsonii* Fisch	1.714285714	1.646090535
19	*Syzygium buxifolium* Hook. & Arn.	1.428571429	1.371742112
20	*Anisoptera scaphula* (Roxb.) Pierre	1.285714286	1.234567901
21	*Gluta tavoyana* Wall.	1.142857143	1.09739369
22	*Streblus asper* Lour.	1.142857143	1.09739369
23	*Dipterocarpus grandiflorus* Blanco	1	0.960219479
24	*Pavetta indica* L.	1	0.960219479
25	*Sapium indicum* Willd.	1	0.960219479
26	*Syzygium gratum*(Wight)S.N.Mitra	1	0.960219479
27	*Archidendron jiringa*(Jack)Nielsen	0.857142857	0.823045267
28	*Barringtonia cymosa* Fischer	0.857142857	0.823045267
29	*Diospyros peregrine* (Gaertn.)Gurke	0.857142857	0.823045267
30	*Garcinia merguensis* Wight	0.857142857	0.823045267
31	*Homalium grandiflorum* Benth.	0.714285714	0.685871056
32	*Buchanania lanzan* Spreng.	0.571428571	0.548696845
33	*Dillenia parviflora* Griff	0.571428571	0.548696845

34	*Diospyros crumentata* Thwaites	0.571428571	0.548696845
35	*Diospyros dictyoneura* Hiern.	0.571428571	0.548696845
36	*Dipterocarpus* sp.	0.571428571	0.548696845
37	*Syzygium claviflorum* (Roxb.)A.M.Cowan &Cowan	0.571428571	0.548696845
38	*Taliparitimacrophyllum* (Roxb. ex Hornem.) Fryxell	0.571428571	0.548696845
39	*Amoora wallichii* King	0.428571429	0.411522634
40	*Anisoptera costata* Korth.	0.428571429	0.411522634
41	*Anisoptera* sp.	0.428571429	0.411522634
42	*Baccaurea sapida* Muell.Arg.	0.428571429	0.411522634
43	*Cinnamomum pachyphyllum* Kosterm.	0.428571429	0.411522634
44	*Cycas pectinata* Buch.-ham.	0.428571429	0.411522634
45	*Dipterocarpus turbinatus*	0.428571429	0.411522634
46	*Garcinia speciosa* Kurz	0.428571429	0.411522634
47	*Mangifera sylvatica* Roxb	0.428571429	0.411522634
48	*Mesua nervosa* L.	0.428571429	0.411522634
49	*Nephelium* sp.	0.428571429	0.411522634
50	*Payena paralleloneura* Kurz	0.428571429	0.411522634
51	Shitshoshitpyit	0.428571429	0.411522634
52	*Xerospermum noronhianum* (Blume)Blume	0.428571429	0.411522634
53	*Chaetocarpus castanocarpus* Thwaites	0.285714286	0.274348422
54	*Dysoxylum* sp.	0.285714286	0.274348422
55	*Firmiana colorata* (Roxb.) R.Br.	0.285714286	0.274348422
56	*Lithocarpus sootepensis*	0.285714286	0.274348422
57	*Maesa paniculata* A.DC.	0.285714286	0.274348422
58	*Myristica malabarica* Lan.	0.285714286	0.274348422
59	*Payena oleifera* Watt.	0.285714286	0.274348422
60	*Salacca wallichiana* Mart.	0.285714286	0.274348422
61	*Syzygium grande* (Wight)Walp	0.285714286	0.274348422
62	*Terminalia catappa* L.	0.285714286	0.274348422
63	*Actinodaphne* sp.(2)	0.142857143	0.137174211
64	*Amoora* sp.	0.142857143	0.137174211
65	*Anisoptera oblonga* Dyer	0.142857143	0.137174211
66	*Vaccinium donianum* Wight.	0.142857143	0.137174211
67	*Ardisia colorata* Roxb.	0.142857143	0.137174211
68	*Areca triandra* Roxb.	0.142857143	0.137174211
69	*Artocarpus chaplasha* Roxb.	0.142857143	0.137174211
70	*Artocarpus lakoocha* Roxb.	0.142857143	0.137174211
71	*Chisocheton divergens* Blume.	0.142857143	0.137174211

72	*Chukrasia tabularis* A.Juss.	0.142857143	0.137174211
73	*Cinnamomum pachyphyllum* Kosterm.	0.142857143	0.137174211
74	*Cratoxylum neriifolium* Kurz.	0.142857143	0.137174211
75	*Engelhardtia spicata* Blume	0.142857143	0.137174211
76	*Erythrina suberosa* Roxb.	0.142857143	0.137174211
77	*Ficus glomerata* Roxb.	0.142857143	0.137174211
78	*Glochidion rubrum*	0.142857143	0.137174211
79	*Hopea sangal* Korth.	0.142857143	0.137174211
80	*Magnolia liliifera* (L.)Bail.	0.142857143	0.137174211
81	*Myristica* sp.	0.142857143	0.137174211
82	*Phoebe tavoyana* (Meissner) Hook.F.	0.142857143	0.137174211
83	*Pterospermum semisagittatum* Buch-Ham	0.142857143	0.137174211
84	*Sapium baccatum* Roxb.	0.142857143	0.137174211
85	*Spondias pinnata* (L.)Kurz.	0.142857143	0.137174211
86	*Syzygium* sp.(1)	0.142857143	0.137174211
87	*Tamarindus indica* L.	0.142857143	0.137174211
88	*Tetrameles nudiflora* R.Br.	0.142857143	0.137174211



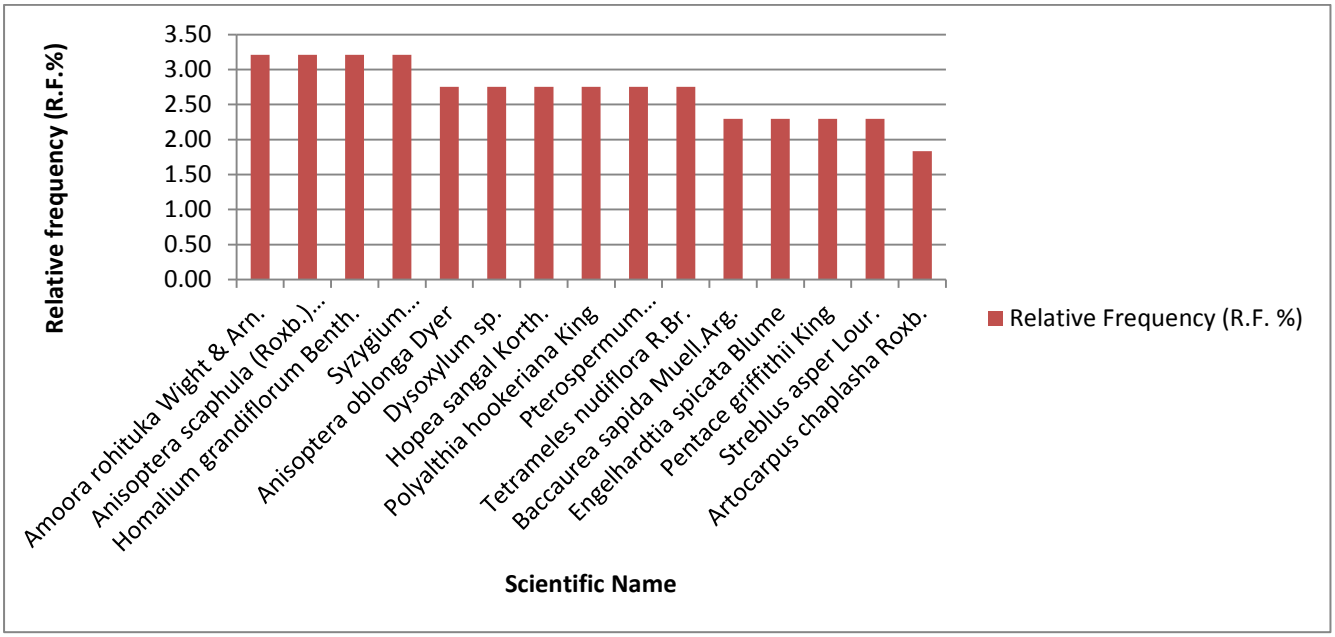
4.5.4 Species distribution by relative frequency class

Relative frequency is the frequency of one species compared to the total frequency of all the species. According the results**,** *Amoora rohituka* Wight & Arn., *Anisoptera scaphula* (Roxb.) Pierre, *Homalium grandiflorum* Benth., and *Syzygium gratum* (Wight) S.N.Mitra had equally high relative frequency value (3.2110%) followed by *Anisoptera oblonga* Dyer (2.7522%), *Dysoxylum* sp. (2.7522%), *Hopea sangal* Korth. (2.7522%), and *Polyalthia hookeriana* King (2.7522%), and *Pterospermum semisagittatum* Buch-Ham (2.7522%) respectively. Therefore these species occur everywhere in the study area.

No.	Scientific name	Frequency (F)	Relative Frequency (R.F. %)
1	*Amoora rohituka* Wight & Arn.	1	3.211009174
2	*Anisoptera scaphula* (Roxb.) Pierre	1	3.211009174
3	*Homalium grandiflorum* Benth.	1	3.211009174
4	*Syzygium gratum*(Wight)S.N.Mitra	1	3.211009174
5	*Anisoptera oblonga* Dyer	0.857142857	2.752293578
6	*Dysoxylum* sp.	0.857142857	2.752293578
7	*Hopea sangal* Korth.	0.857142857	2.752293578
8	*Polyalthia hookeriana* King	0.857142857	2.752293578
9	*Pterospermum semisagittatum* Buch-Ham	0.857142857	2.752293578
10	*Tetrameles nudiflora* R.Br.	0.857142857	2.752293578
11	*Baccaurea sapida* Muell.Arg.	0.714285714	2.293577982
12	*Engelhardtia spicata* Blume	0.714285714	2.293577982
13	*Pentace griffithii* King	0.714285714	2.293577982
14	*Streblus asper* Lour.	0.714285714	2.293577982
15	*Artocarpus chaplasha* Roxb.	0.571428571	1.834862385
16	*Chaetocarpus castanocarpus* Thwaites	0.571428571	1.834862385
17	*Ficus glomerata* Roxb.	0.571428571	1.834862385
18	*Ormosia watsonii* Fisch	0.571428571	1.834862385
19	*Payena paralleloneura* Kurz	0.571428571	1.834862385
20	*Sapium baccatum* Roxb.	0.571428571	1.834862385
21	*Shorea* sp.	0.571428571	1.834862385
22	*Syzygium* sp.(1)	0.571428571	1.834862385
23	*Amoora* sp.	0.428571429	1.376146789
24	*Areca triandra* Roxb.	0.428571429	1.376146789
25	*Artocarpus lakoocha* Roxb.	0.428571429	1.376146789
26	*Firmiana colorata* (Roxb.) R.Br.	0.428571429	1.376146789
27	*Garcinia speciosa* Kurz	0.428571429	1.376146789
28	*Glochidion rubrum*	0.428571429	1.376146789
29	*Knema erratica*	0.428571429	1.376146789
30	*Spondias pinnata* (L.)Kurz.	0.428571429	1.376146789
31	*Swintonia floribunda* Griff.	0.428571429	1.376146789
32	*Syzygium* sp.(2)	0.428571429	1.376146789
33	*Amoora wallichii* King	0.285714286	0.917431193
34	*Barringtonia cymosa* Fischer	0.285714286	0.917431193
35	*Buchanania lanzan* Spreng.	0.285714286	0.917431193
36	*Chukrasia tabularis* A.Juss.	0.285714286	0.917431193
37	*Cinnamomum pachyphyllum* Kosterm.	0.285714286	0.917431193

38	*Cinnamomum pachyphyllum* Kosterm.	0.285714286	0.917431193
39	*Diospyros crumentata* Thwaites	0.285714286	0.917431193
40	*Diospyros dictyoneura* Hiern.	0.285714286	0.917431193
41	*Dipterocarpus turbinatus*	0.285714286	0.917431193
42	*Licuala peltata* Roxb.	0.285714286	0.917431193
43	*Mesua nervosa* L.	0.285714286	0.917431193
44	*Myristica* sp.	0.285714286	0.917431193
45	*Phoebe* sp.	0.285714286	0.917431193
46	*Phoebe tavoyana* (Meissner) Hook.F.	0.285714286	0.917431193
47	*Syzygium grande* (Wight)Walp	0.285714286	0.917431193
48	*Tamarindus indica* L.	0.285714286	0.917431193
49	*Actinodaphne* sp.(2)	0.142857143	0.458715596
50	*Anisoptera costata* Korth.	0.142857143	0.458715596
51	*Anisoptera* sp.	0.142857143	0.458715596
52	*Vaccinium donianum* Wight.	0.142857143	0.458715596
53	*Aporusa dioica* (Roxb.) Mull.Arg.	0.142857143	0.458715596
54	*Archidendron jiringa*(Jack)Nielsen	0.142857143	0.458715596
55	*Ardisia colorata* Roxb.	0.142857143	0.458715596
56	*Carallia brachiata* (Lour.)Merr.	0.142857143	0.458715596
57	*Castanopsis* sp.	0.142857143	0.458715596
58	*Chisocheton divergens* Blume.	0.142857143	0.458715596
59	*Cratoxylum neriifolium* Kurz.	0.142857143	0.458715596
60	*Cycas pectinata* Buch.-ham.	0.142857143	0.458715596
61	*Dillenia parviflora* Griff	0.142857143	0.458715596
62	*Diospyros peregrina*(Gaertn.)Gurke	0.142857143	0.458715596
63	*Dipterocarpus grandiflorus* Blanco	0.142857143	0.458715596
64	*Dipterocarpus* sp.	0.142857143	0.458715596
65	*Erythrina suberosa* Roxb.	0.142857143	0.458715596
66	*Eugenia oblata* Roxb.	0.142857143	0.458715596
67	*Eugenia* sp.(1)	0.142857143	0.458715596
68	*Garcinia merguensis* Wight	0.142857143	0.458715596
69	*Gluta tavoyana* Wall.	0.142857143	0.458715596
70	*Lithocarpus sootepensis*	0.142857143	0.458715596
71	*Maesa paniculata* A.DC.	0.142857143	0.458715596
72	*Magnolia liliifera* (L.)Bail.	0.142857143	0.458715596
73	*Mangifera sylvatica* Roxb	0.142857143	0.458715596
74	*Myristica malabarica* Lan.	0.142857143	0.458715596
75	*Nauclea sessilifolia* Roxb.	0.142857143	0.458715596

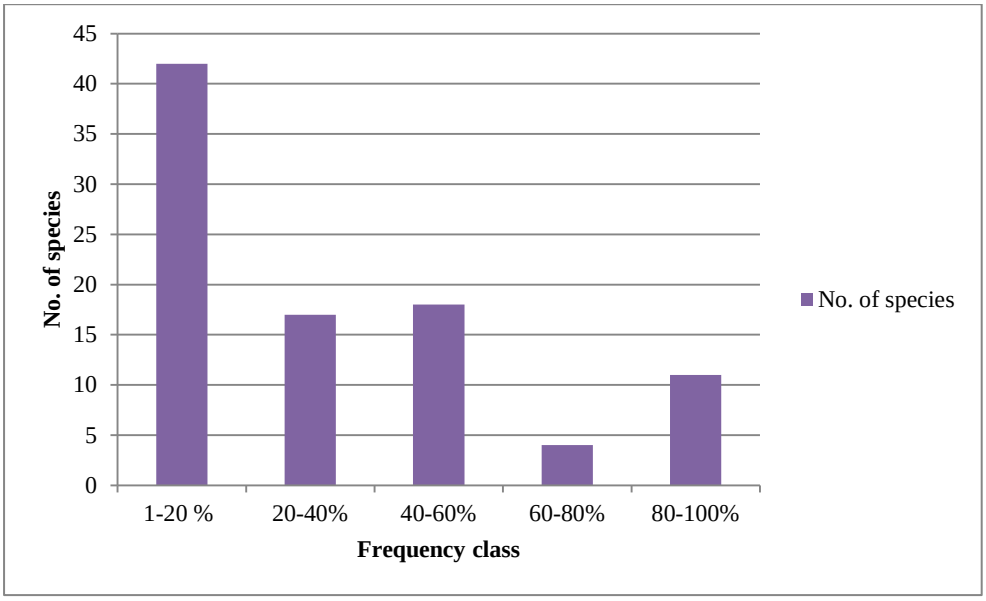
76	*Nephelium* sp.	0.142857143	0.458715596
77	*Pavetta indica* L.	0.142857143	0.458715596
78	*Payena oleifera* Watt.	0.142857143	0.458715596
79	*Salacca wallichiana* Mart.	0.142857143	0.458715596
80	*Sapium indicum* Willd.	0.142857143	0.458715596
81	Shitshoshitpyit	0.142857143	0.458715596
82	*Shorea cinerea* Fischer	0.142857143	0.458715596
83	*Syzygium buxifolium* Hook. & Arn.	0.142857143	0.458715596
84	*Syzygium claviflorum* (Roxb.)A.M.Cowan &Cowan	0.142857143	0.458715596
85	*Taliparitimacrophyllum* (Roxb. ex Hornem.) Fryxell	0.142857143	0.458715596
86	*Terminalia catappa* L.	0.142857143	0.458715596
87	*Theobroma* sp.	0.142857143	0.458715596
88	*Xerospermum noronhianum* (Blume)Blume	0.142857143	0.458715596



4.5.5 Species distribution by relative frequency class

In order to clarify the homogeneity and heterogeneity of the floristic distribution in the area, the species distribution by frequency class was examined. According to the outcome of the frequency classes, only fifteen species are in high frequency class and 59% of the species are in intermediate frequency class. This shows that this area is floristically heterogeneous.

Frequency class	No. of species
1-20 %	42
20-40%	17
40-60%	18
60-80%	4
80-100%	11



4.5.6. Vegetation types in the area

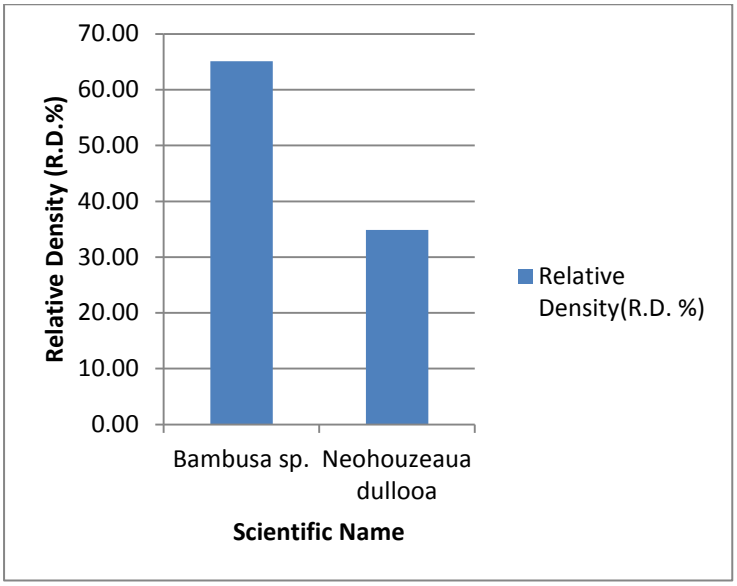
No.	Locality	Vegetation type	Latitude	Longitude	Altitude	Note
1.	Near Phutmatet Mountain	Evergreen	N 14˚ 26' 44.1"	E 098˚ 12' 43.7"	484.5m	*Amoora rohituka, Licuala peltata, Swintonia floribunda,Pentace griffithii, Theobroma* sp., *Swintonia floribunda, Aporosa octandra, Knema erratica Polyalthia simiarum, Syzygium gratum Archidendron jiringa, Shorea cinerea Castanopsis* sp.
2.	Near Shweoomine	Evergreen	N 14˚ 26' 24.7"	E 098˚ 12' 53.3"	484.5m	
3.	Near Shweoomine Stream	Evergreen	N 14˚ 26' 24.5"	E 098˚ 13' 11.0"	540.6m	
4.	Near Near Luwine Stream Three Tributaries	Evergreen	N 14˚ 26' 13.7"	E 098˚ 13' 24.3"	540.6m	
5.	Between Luwine Mountain Range and Phutmatet Mountain Range	Evergreen	N 14˚ 26' 52.6"	E 098˚ 12' 49.8"	540m	
6.	Eastern side of Phutmatet Mountain	Evergreen	N 14˚ 26' 52.0"	E 098˚ 12' 49.3"	512.7m	
7.	Near Phonegyi Khante Boundary	Evergreen	N 14˚ 27' 10.2"	E 098˚ 12' 19.0"	530.1m	

4.5.7 Bamboo Species Population

No.	Scientific Name	No. of individual	Total no. of individual/ ha	Total no. of population/ ha (%)
1	*Bambusa* sp.	28	700	65.11627907
2	*Neohouzeaua dullooa*	15	375	34.88372093
	Total	**43**	**1075**	**100**

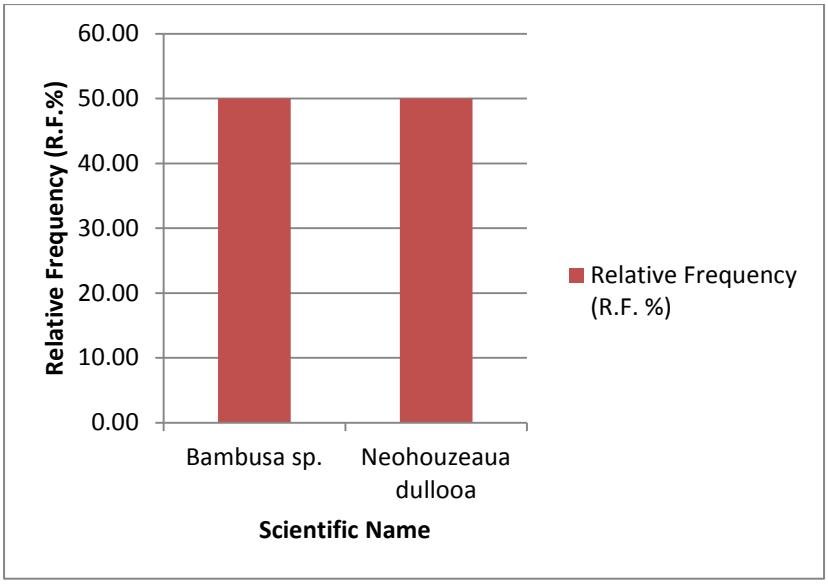
4.5.8 Relative density

No.	Scientific Name	Density (D)	Relative Density (R.D. %)
1	*Bambusa* sp.	28	65.11627907
2	*Neohouzeaua dullooa*	15	34.88372093



4.5.9 Species distribution

No.	Scientific Name	Frequency (F)	Relative Frequency (R.F. %)
1	*Bambusa* sp.	1	50
2	*Neohouzeaua dullooa*	1	50



4.5.10. Discussion

A total of 88 species belonging to 64 genera were analyzed in the study area. The main vegetation types in this area can be grouped into three formations i.e. evergreen forest, high evergreen forest and bamboo forest. The secondary forests are also found near bamboo forest. The leading dominant species are *Theobroma* sp., *Licuala peltata, Swintonia floribunda, Castanopsis* sp., *Amoora rohituka, Theobroma* sp. and *Licuala peltata,* and they are in highest frequency so that these species are said to be common in this area. The dominant bamboo species *Bambusa* sp. and *Neohouzeaua dullooa* and these two species are also in highest in frequency. Out of 88 species 69 species are in low frequency class and these species are said to be rare species.

The forests in this area show some types of disturbance. The canopy of the forest is more or less closed. The canopy layer is dominated by *Cinnamomum pachyphyllum* (Hmanthin), *Barringtonia cyosa* (Kalagyi-ywet-gyi), *Phobe tavoyana* (Kye-ze) and *Nephelium* sp. (Kyet-mauk-ni).The emergent tree species are *Eugenia oblate* (tha-bye-ni), *Shorea cinerea* (Ka-dut), *Anisoptera scaphula* (Kaung-mu) and *Syzygium* sp.(1) (Tha-bye-phyu). The presence of some secondary forests shows the influence of human impacts on the forest.

4.6. Oakthayan Junction area

Primary Forest

Secondary Forest

Bamboo forest

Overview forest type

4.6.1 Floristic composition

The total number of tree species in 3 sample plots is 60 species belonging to 53 genera. The bamboo species in 2 sample plots is only two species belonging to two genera. The dominant tree species is *Aporusa dioica (Roxb.) Mull.Arg.* (Thit-khauk) followed by *Licuala peltata* Roxb. (Sa-lu) and *Leea macrophylla* Roxb.(Kyar-phet-gyi). The dominant bamboo species is *Neohouzeaua dullooa* (Zum-wa).

4.6.2 Tree Species Population

No.	Scientific Name	No. of individual	Total no. of individual/ha	Total no. of population/ha (%)
1	*Achras zapota* L.	1	6	0.4785
2	*Alstonia scholaris* (L.)R.Br	1	6	0.4785
3	*Amoora wallichii* King	1	6	0.4785
4	*Anisoptera costata* Korth.	1	6	0.4785

5	*Anneslea fragrans* Wall.	2	12	0.9569
6	*Aporusa dioica (Roxb.) Mull.Arg.*	22	129	10.5263
7	*Archidendron jiringa*(Jack)Nielsen	1	6	0.4785
8	*Baccaurea sapida* Muell.Arg.	5	29	2.3923
9	*Barringtonia cymosa* Fischer	1	6	0.4785
10	*Callerya atropurpurea* (Wall.) Schot.	1	6	0.4785
11	*Castanopsis sp*.	1	6	0.4785
12	*Castanopsis tribuloides* A.DC.	3	18	1.4354
13	*Chisocheton paniculatus* Hiern.	1	6	0.4785
14	*Cinnamomum pachyphyllum* Kosterm.	1	6	0.4785
15	*Derris* sp.	3	18	1.4354
16	*Dillenia parviflora* Griff	4	24	1.9139
17	*Dipterocarpus* sp.	7	41	3.3493
18	*Engelhardtia spicata* Blume	2	12	0.9569
19	*Eugenia oblata* Roxb.	2	12	0.9569
20	*Eugenia* sp.(1)	1	6	0.4785
21	*Garcinia merguensis* Wight	3	18	1.4354
22	*Garcinia speciosa* Kurz	9	53	4.3062
23	*Glochidion rubrum*	1	6	0.4785
24	*Homalium grandiflorum* Benth.	1	6	0.4785
25	*Hopea helferi* (Dyer) Brandis	1	6	0.4785
26	*Knema erratica*	1	6	0.4785
27	*Leea macrophylla* Roxb.	11	65	5.2632
28	*Licuala peltata* Roxb.	20	118	9.5694
29	*Lithocarpus elegans* (Blume) Hatusima ex Saepadma	1	6	0.4785
30	*Litsea glutinosa* (Lour.)C.B. Robins.	9	53	4.3062
31	*Litsea salicifolia* (Nees) Hook.f	3	18	1.4354
32	*Livistona speciosa* Kurz	1	6	0.4785
33	*Maesa paniculata* A.DC.	1	6	0.4785
34	*Mangifera sylvatica* Roxb	7	41	3.3493
35	*Memecylon grande* Retz.	2	12	0.9569
36	*Mesua nervosa* L.	4	24	1.9139
37	*Myristica* sp.	1	6	0.4785
38	*Palaquium obovatum* (Griff.) Engl.	1	6	0.4785
39	*Pavetta indica* L.	5	29	2.3923
40	*Pentace griffithii* King	1	6	0.4785

41	*Phoebe tavoyana* (Meissner) Hook.F.	6	35	2.8708
42	*Polyalthia hookeriana* King	4	24	1.9139
43	*Pterospermum semisagittatum* Buch-Ham	6	35	2.8708
44	*Putranjiva roxburghii* Wall.	5	29	2.3923
45	*Salacca wallichiana* Mart.	1	6	0.4785
46	*Schima wallichii* (DC.)Korth.	1	6	0.4785
47	*Shorea cinerea* Fischer	2	12	0.9569
48	*Shorea henryana* Pierre	1	6	0.4785
49	*Stereospermum grandiflorum* Cubitt & W.W.Sm.	4	24	1.9139
50	*Streblus taxoides* (K.Henye)Kurz	5	29	2.3923
51	*Swintonia floribunda* Griff.	1	6	0.4785
52	*Syzygium gratum*(Wight)S.N.Mitra	3	18	1.4354
53	*Terminalia bellerica* Roxb.	1	6	0.4785
54	*Tetrameles nudiflora* R.Br.	1	6	0.4785
55	*Theobroma* sp.	6	35	2.8708
56	Tiliacaeae	4	24	1.9139
57	*Tristaniopsis burmanica* (Griff.)P.G.Wilsan & J.T.Waterh.	1	6	0.4785
58	*Tristaniopsis* sp.	10	59	4.7847
59	*Ulmus lancifolia* Roxb.	1	6	0.4785
60	*Wrightia arborea* (Dennst.) Mabb.	2	12	0.9569
	Total	**209**	**1229**	**100**

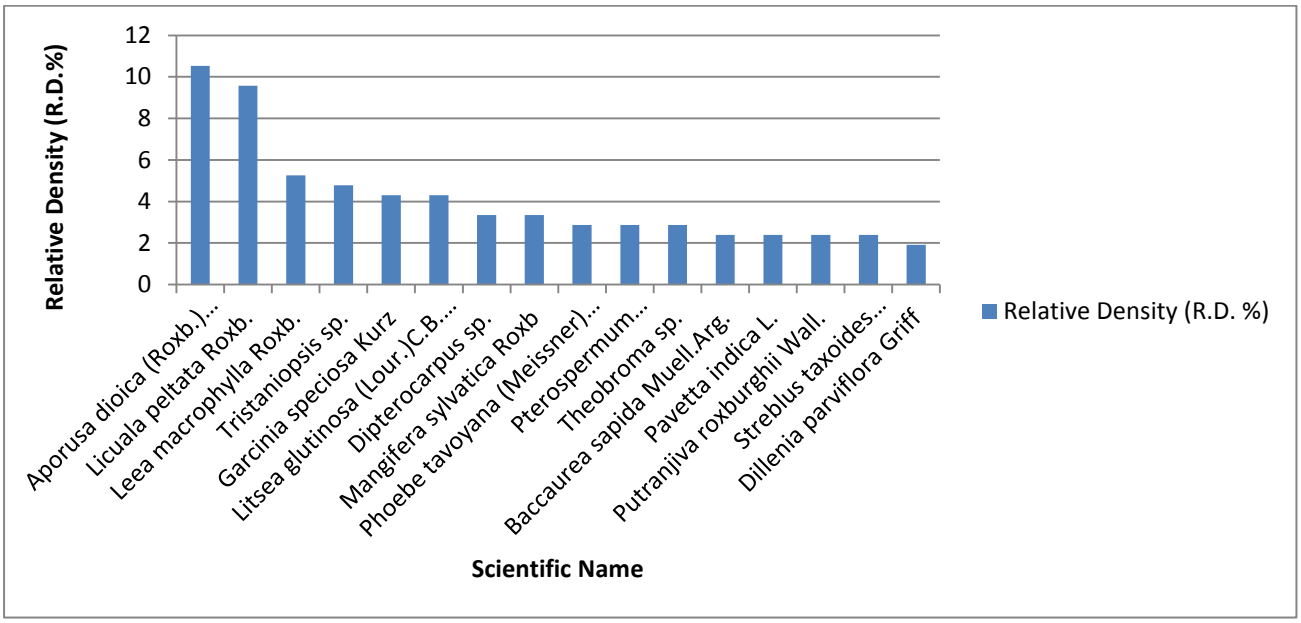
4.6.3 Relative density

Among the sample plots species density per hectare varied and the highest density was observed *Aporusa dioica (Roxb.) Mull.Arg.* followed by *Licuala peltata* Roxb.. This shows that these two species are abundant in this area.

No.	Scientific name	Density (D)	Relative Density (R.D. %)
1	*Aporusa dioica (Roxb.) Mull.Arg.*	7.333333333	10.52631579
2	*Licuala peltata* Roxb.	6.666666667	9.56937799
3	*Leea macrophylla* Roxb.	3.666666667	5.263157895
4	*Tristaniopsis* sp.	3.333333333	4.784688995
5	*Garcinia speciosa* Kurz	3	4.306220096
6	*Litsea glutinosa* (Lour.)C.B. Robins.	3	4.306220096

7	*Dipterocarpus* sp.	2.333333333	3.349282297
8	*Mangifera sylvatica* Roxb	2.333333333	3.349282297
9	*Phoebe tavoyana* (Meissner) Hook.F.	2	2.870813397
10	*Pterospermum semisagittatum* Buch-Ham	2	2.870813397
11	*Theobroma* sp.	2	2.870813397
12	*Baccaurea sapida* Muell.Arg.	1.666666667	2.392344498
13	*Pavetta indica* L.	1.666666667	2.392344498
14	*Putranjiva roxburghii* Wall.	1.666666667	2.392344498
15	*Streblus taxoides* (K.Henye)Kurz	1.666666667	2.392344498
16	*Dillenia parviflora* Griff	1.333333333	1.913875598
17	*Mesua nervosa* L.	1.333333333	1.913875598
18	*Polyalthia hookeriana* King	1.333333333	1.913875598
19	*Stereospermum grandiflorum* Cubitt & W.W.Sm.	1.333333333	1.913875598
20	Tiliacaeae	1.333333333	1.913875598
21	*Castanopsis tribuloides* A.DC.	1	1.435406699
22	*Derris* sp.	1	1.435406699
23	*Garcinia merguensis* Wight	1	1.435406699
24	*Litsea salicifolia* (Nees) Hook.f	1	1.435406699
25	*Syzygium gratum*(Wight)S.N.Mitra	1	1.435406699
26	*Anneslea fragrans* Wall.	0.666666667	0.956937799
27	*Engelhardtia spicata* Blume	0.666666667	0.956937799
28	*Eugenia oblata* Roxb.	0.666666667	0.956937799
29	*Memecylon grande* Retz.	0.666666667	0.956937799
30	*Shorea cinerea* Fischer	0.666666667	0.956937799
31	*Wrightia arborea* (Dennst.) Mabb.	0.666666667	0.956937799
32	*Achras zapota* L.	0.333333333	0.4784689
33	*Alstonia scholaris* (L.)R.Br	0.333333333	0.4784689
34	*Amoora wallichii* King	0.333333333	0.4784689
35	*Anisoptera costata* Korth.	0.333333333	0.4784689
36	*Archidendron jiringa*(Jack)Nielsen	0.333333333	0.4784689
37	*Barringtonia cymosa* Fischer	0.333333333	0.4784689
38	*Callerya atropurpurea* (Wall.) Schot.	0.333333333	0.4784689
39	*Castanopsis sp*.	0.333333333	0.4784689
40	*Chisocheton paniculatus* Hiern.	0.333333333	0.4784689

41	*Cinnamomum pachyphyllum* Kosterm.	0.333333333	0.4784689
42	*Eugenia* sp.(1)	0.333333333	0.4784689
43	*Glochidion rubrum*	0.333333333	0.4784689
44	*Homalium grandiflorum* Benth.	0.333333333	0.4784689
45	*Hopea helferi* (Dyer) Brandis	0.333333333	0.4784689
46	*Knema erratica*	0.333333333	0.4784689
47	*Lithocarpus elegans* (Blume) Hatusima ex Saepadma	0.333333333	0.4784689
48	*Livistona speciosa* Kurz	0.333333333	0.4784689
49	*Maesa paniculata* A.DC.	0.333333333	0.4784689
50	*Myristica* sp.	0.333333333	0.4784689
51	*Palaquium obovatum* (Griff.) Engl.	0.333333333	0.4784689
52	*Pentace griffithii* King	0.333333333	0.4784689
53	*Salacca wallichiana* Mart.	0.333333333	0.4784689
54	*Schima wallichii* (DC.)Korth.	0.333333333	0.4784689
55	*Shorea henryana* Pierre	0.333333333	0.4784689
56	*Swintonia floribunda* Griff.	0.333333333	0.4784689
57	*Terminalia bellerica* Roxb.	0.333333333	0.4784689
58	*Tetrameles nudiflora* R.Br.	0.333333333	0.4784689
59	*Tristaniopsis burmanica* (Griff.)P.G.Wilsan & J.T.Waterh.	0.333333333	0.4784689
60	*Ulmus lancifolia* Roxb.	0.333333333	0.4784689

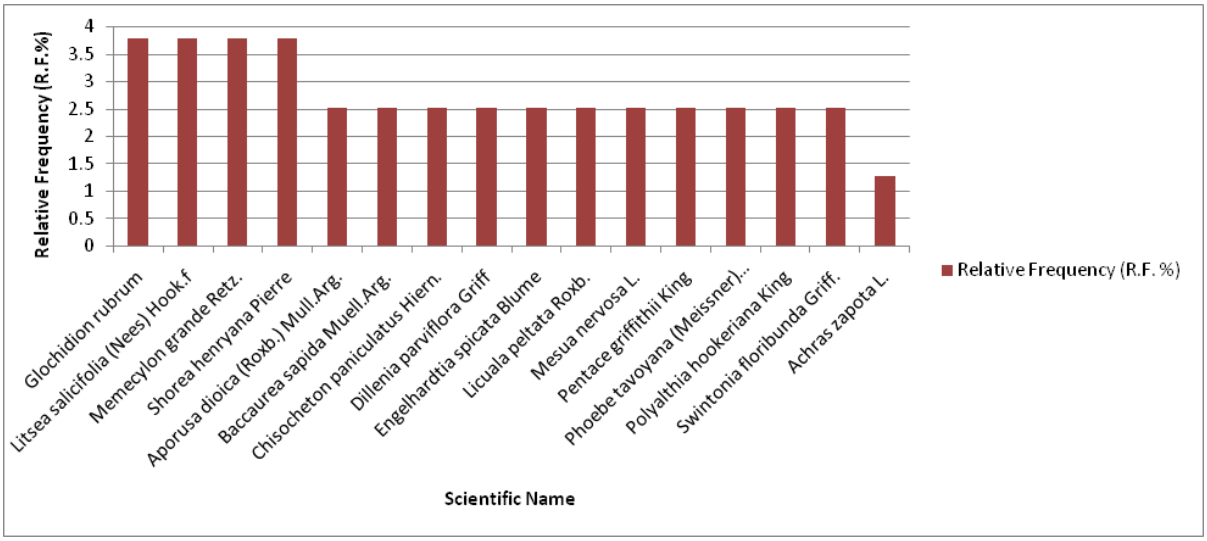


4.6.4 Relative frequency of Tree species

Relative frequency is the frequency of one species compared to the total frequency of all the species. According the results**,** *Glochidion rubrum*., *Litsea salicifolia* (Nees) Hook.f, *Memecylon grande* Retz., and *Shorea henryana* Pierre had equally high relative frequency value (3.7974%) followed by *Aporusa dioica* (Roxb.) Mull. Arg. (2.5316%), *Baccaurea sapida* Muell. Arg. (2.5316%), *Chisocheton paniculatus* Hiern (2.5316%) and *Dillenia parviflora* Griff (2.5316%), and *Engelhardtia spicata* Blume (2.5316%) respectively. Therefore these species occur everywhere in the study area.

No.	Scientific Name	Frequency (F)	Relative Frequency (R.F. %)
1	*Glochidion rubrum*	1.0000000000	3.797468354
2	*Litsea salicifolia* (Nees) Hook.f	1.0000000000	3.797468354
3	*Memecylon grande* Retz.	1.0000000000	3.797468354
4	*Shorea henryana* Pierre	1.0000000000	3.797468354
5	*Aporusa dioica* (Roxb.) Mull.Arg.	0.6666666667	2.53164557
6	*Baccaurea sapida* Muell.Arg.	0.6666666667	2.53164557
7	*Chisocheton paniculatus* Hiern.	0.6666666667	2.53164557
8	*Dillenia parviflora* Griff	0.6666666667	2.53164557
9	*Engelhardtia spicata* Blume	0.6666666667	2.53164557
10	*Licuala peltata* Roxb.	0.6666666667	2.53164557
11	*Mesua nervosa* L.	0.6666666667	2.53164557
12	*Pentace griffithii* King	0.6666666667	2.53164557
13	*Phoebe tavoyana* (Meissner) Hook.F.	0.6666666667	2.53164557
14	*Polyalthia hookeriana* King	0.6666666667	2.53164557
15	*Swintonia floribunda* Griff.	0.6666666667	2.53164557
16	*Achras zapota* L.	0.3333333333	1.265822785
17	*Alstonia scholaris* (L.)R.Br	0.3333333333	1.265822785
18	*Amoora wallichii* King	0.3333333333	1.265822785
19	*Anisoptera costata* Korth.	0.3333333333	1.265822785
20	*Anneslea fragrans* Wall.	0.3333333333	1.265822785
21	*Archidendron jiringa*(Jack)Nielsen	0.3333333333	1.265822785
22	*Barringtonia cymosa* Fischer	0.3333333333	1.265822785
23	*Callerya atropurpurea* (Wall.) Schot.	0.3333333333	1.265822785
24	*Castanopsis sp*.	0.3333333333	1.265822785
25	*Castanopsis tribuloides* A.DC.	0.3333333333	1.265822785
26	*Cinnamomum pachyphyllum* Kosterm.	0.3333333333	1.265822785

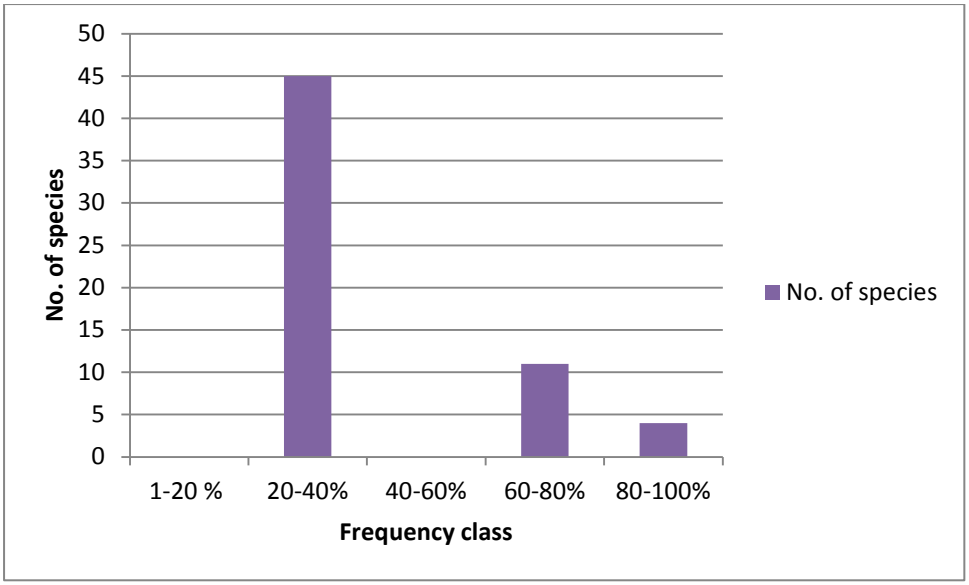
27	*Derris* sp.	0.3333333333	1.265822785
28	*Dipterocarpus* sp.	0.3333333333	1.265822785
29	*Eugenia oblata* Roxb.	0.3333333333	1.265822785
30	*Eugenia* sp.(1)	0.3333333333	1.265822785
31	*Garcinia merguensis* Wight	0.3333333333	1.265822785
32	*Garcinia speciosa* Kurz	0.3333333333	1.265822785
33	*Homalium grandiflorum* Benth.	0.3333333333	1.265822785
34	*Hopea helferi* (Dyer) Brandis	0.3333333333	1.265822785
35	*Knema erratica*	0.3333333333	1.265822785
36	*Leea macrophylla* Roxb.	0.3333333333	1.265822785
37	*Lithocarpus elegans* (Blume) Hatusima ex Saepadma	0.3333333333	1.265822785
38	*Litsea glutinosa* (Lour.)C.B. Robins.	0.3333333333	1.265822785
39	*Livistona speciosa* Kurz	0.3333333333	1.265822785
40	*Maesa paniculata* A.DC.	0.3333333333	1.265822785
41	*Mangifera sylvatica* Roxb	0.3333333333	1.265822785
42	*Myristica* sp.	0.3333333333	1.265822785
43	*Palaquium obovatum* (Griff.) Engl.	0.3333333333	1.265822785
44	*Pavetta indica* L.	0.3333333333	1.265822785
45	*Pterospermum semisagittatum* Buch-Ham	0.3333333333	1.265822785
46	*Putranjiva roxburghii* Wall.	0.3333333333	1.265822785
47	*Salacca wallichiana* Mart.	0.3333333333	1.265822785
48	*Schima wallichii* (DC.)Korth.	0.3333333333	1.265822785
49	*Shorea cinerea* Fischer	0.3333333333	1.265822785
50	*Stereospermum grandiflorum* Cubitt & W.W.Sm.	0.3333333333	1.265822785
51	*Streblus taxoides* (K.Henye)Kurz	0.3333333333	1.265822785
52	*Syzygium gratum*(Wight)S.N.Mitra	0.3333333333	1.265822785
53	*Terminalia bellerica* Roxb.	0.3333333333	1.265822785
54	*Tetrameles nudiflora* R.Br.	0.3333333333	1.265822785
55	*Theobroma* sp.	0.3333333333	1.265822785
56	Tiliacaeae	0.3333333333	1.265822785
57	*Tristaniopsis burmanica* (Griff.)P.G.Wilsan & J.T.Waterh.	0.3333333333	1.265822785
58	*Tristaniopsis* sp.	0.3333333333	1.265822785
59	*Ulmus lancifolia* Roxb.	0.3333333333	1.265822785
60	*Wrightia arborea* (Dennst.) Mabb.	0.3333333333	1.265822785



4.6.5 Species distribution by frequency class

In order to clarify the homogeneity and heterogeneity of the floristic distribution in the area, the species distribution by frequency class was examined. According to the outcome of the frequency classes, only fifteen species are in intermediate frequency class and 45% of the species are in low frequency class. This shows that this area is floristically high degree of heterogeneity.

Frequency class	No. of species
1-20 %	0
20-40%	45
40-60%	0
60-80%	11
80 - 100 %	4



4.6.6 Vegetation types in the area

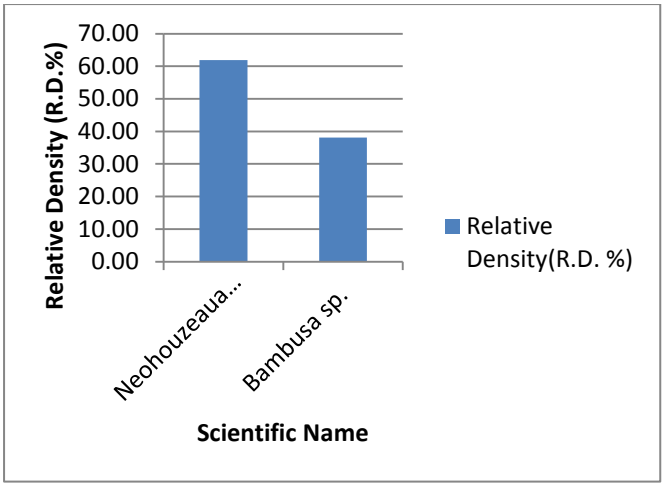
No.	Locality	Vegetation type	Latitude	Longitude	Altitude	Note
1.	Ye bya Mountain Range	Evergreen	N 14˚ 22' 35.1"	E 098˚ 11' 40.5"	235.5m	*Lithocarpus elegans, Licuala peltata, Theobroma* sp., *Pentace griffithi Tetrameles nudiflora, Litsea salicifolia, Pterospermum semisagittatum, Callerya atropurpurea, Glochidion rubrum Stereospermum grandiflorum Engelhardtia spicata, Aporosa octandra, Tristaniopsis* sp. *Memecylon grande*
2.	Near Kyuk kyum Stream	Evergreen	N 14˚ 22' 34.5"	E 098˚ 11' 58.0"	399m	
3.	Taung pyin gone mountain top & Kyezepin Pyar	Evergreen	N 14˚ 21' 50.9"	E 098˚ 12' 17.3"	571.8m	

4.6.7. Bamboo Species Population

No.	Scientific Name	No. of individual	Total no. of individual/ ha	Total no. of population/ ha (%)
1	*Bambusa* sp.	185	1423	38.1443299
2	*Neohouzeaua dullooa*	300	2308	61.8556701
	Total	**485**	**3731**	**100**

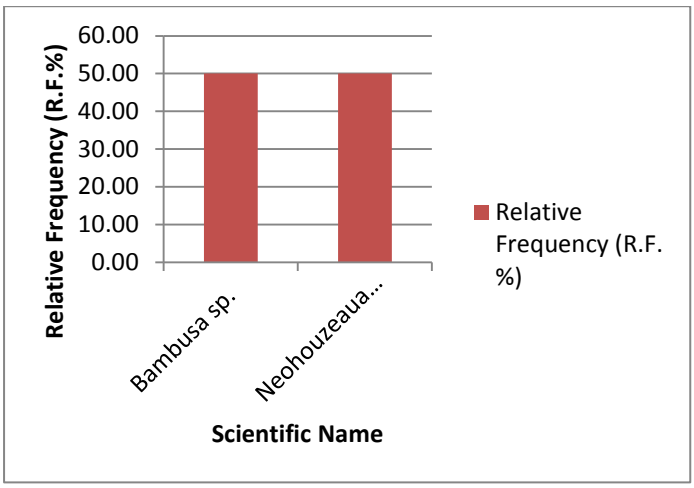
4.6.8. Relative density

No.	Scientific Name	Density (D)	Relative Density (R.D. %)
1	*Neohouzeaua dullooa*	150	61.8556701
2	*Bambusa* sp.	92.5	38.1443299



4.6.9. Species distribution

No.	Scientific Name	Frequency (F)	Relative Frequency (R.F. %)
1	*Bambusa* sp.	0.5	50
2	*Neohouzeaua dullooa*	0.5	50



4.6.10 Discussion

A total of 60 species belonging to 53 genera were analyzed in the study area. The main vegetation types in this area can be grouped into three formations i.e. evergreen forest, deciduous forest and bamboo forest. The secondary forests are also found near bamboo forest. The leading dominant species are *Lithocarpus elegans*, *Licuala peltata*, *Theobroma* sp., *Tetrameles nudiflora*, *Litsea salicifolia*, *Pterospermum semisagittatum*, *Lithocarpus elegans* and *Licuala peltata*, and they are in highest frequency so that these species are said to be common in this area.The species in low frequency class are rare speciecs. The dominant bamboo species *Bambusa* sp. and *Neohouzeaua dullooa* and these two species are also in highest in frequency.

The forests in this area show some types of disturbance. The canopy of the forest is more or less opened. The presence of some secondary forests shows the influence of human impacts on the forest.

4.7 Kalontar Aishae area

Primary Forest

Secondary Forest

Low land deciduous forest

Bamboo forest

Illegal logging

Water fall

***Illicium verum* (Rare Species)**

4.7.1 Floristic composition

The total number of species in 8 representative sample plots is 84 species belonging to 70 genera.The bamboo species in 2 representative sample plots is only two species belonging to two genera. The dominant one is *Neohauzeaua* dullooa. The dominant tree species is *Aporusa dioica (Roxb.) Mull.Arg.* (Thit-khauk) followed by *Dillenia parviflora* Garh. (Zin-byum) and *Cratoxylum polyanthum* Korth.(Mat-pe-phyu).*Illicium verum* is the rare species which is the famous Chinese medicine and also used as spices.

4.7.2 Tree Species Population

No.	Scientific Name	No. of individual	Total no. of individual/ha	Total no. of population /ha (%)
1	*Achras zapota* L.	1	3	0.1548
2	*Actinodaphne* sp.(2)	2	5	0.3096
3	*Alstonia scholaris* (L.)R.Br	1	3	0.1548
4	*Amoora wallichii* King	1	3	0.1548
5	*Anisoptera curtisii* Dyer	8	22	1.2384
6	*Anisoptera oblonga* Dyer	3	8	0.4644
7	*Antidesma ghesaembilla* Gaertn.	1	3	0.1548
8	*Aporusa dioica (Roxb.) Mull.Arg.*	57	154	8.8235
9	*Ardisia colorata* Roxb.	1	3	0.1548
10	*Avicennia officinalis* L.	2	5	0.3096

11	*Barringtonia angusta* Kurz	3	8	0.4644
12	*Barringtonia cymosa* Fischer	8	22	1.2384
13	*Bombax ceiba* L.	1	3	0.1548
14	*Buchanania lanzan* Spreng.	1	3	0.1548
15	*Callerya atropurpurea* (Wall.) Schot.	1	3	0.1548
16	*Carallia brachiata* (Lour.)Merr.	1	3	0.1548
17	*Careya arborea* Roxb.	1	3	0.1548
18	*Cassia alata* L.	24	65	3.7152
19	*Castanopsis* sp.	17	46	2.6316
20	*Chaetocarpus castanocarpus* Thwaites	2	5	0.3096
21	*Chisocheton paniculatus* Hiern.	1	3	0.1548
22	*Chukrasia tabularis* A.Juss.	7	19	1.0836
23	*Cinnamomum nitidum* Blume	2	5	0.3096
24	*Cinnamomum pachyphyllum* Kosterm.	10	27	1.5480
25	*Cratoxylum neriifolium* Kurz.	25	68	3.8700
26	*Cratoxylum polyanthum* Korth.	42	114	6.5015
27	*Croton roxburghianus* N.P.Balakr	1	3	0.1548
28	*Crypteronia pubescens* Blume	6	16	0.9288
29	*Dillenia parviflora* Griff	48	130	7.4303
30	*Diospyros crumentata* Thwaites	34	92	5.2632
31	*Dipterocarpus grandiflorus* Blanco	2	5	0.3096
32	*Dipterocarpus* sp.	3	8	0.4644
33	*Emblica officinalis* Gaertn.	17	46	2.6316
34	*Erythrina suberosa* Roxb.	3	8	0.4644
35	*Eugenia oblata* Roxb.	9	24	1.3932
36	*Firmiana colorata* (Roxb.)R.Br.	5	14	0.7740
37	*Fluggea virosa* (Roxb.exWilld)Voigt	1	3	0.1548
38	*Garcinia speciosa* Kurz	2	5	0.3096
39	*Gardenia sootepensis* Hutch.	1	3	0.1548
40	*Gonocaryum griffithianum* (Miers)Kurz	1	3	0.1548
41	*Heterophragma adenophylla* (Wall.) Seem. ex Benth. & Hook	2	5	0.3096
42	*Holarrhena pubescens* Wall.	1	3	0.1548

43	*Knema erratica*	3	8	0.4644
44	*Lagerstroemia floribunda* Jack	2	5	0.3096
45	*Lagerstroemia speciosa* (L.)Pers.	7	19	1.0836
46	*Lannea coromandelica* (Houtt.)Merr.	3	8	0.4644
47	*Licuala peltata* Roxb.	1	3	0.1548
48	*Lithocarpus elegans* (Blume) Hatusima ex Saepadma	28	76	4.3344
49	Litsea glutinosa (Lour.)C.B. Robins.	5	14	0.7740
50	*Litsea grandis* (Nees) Hook.f	1	3	0.1548
51	*Litsea laurifolia* (Jacq.)Kurz	1	3	0.1548
52	*Lophopetalum fimbriatum* Wight	4	11	0.6192
53	*Melanorrhoea glabra* Wall.	6	16	0.9288
54	*Mesua nervosa* L.	12	32	1.8576
55	*Microcos paniculata* L.	14	38	2.1672
56	*Mitragyna parvifolia* (Roxb.) Korth.	10	27	1.5480
57	*Myristica angustifolia* Roxb.	4	11	0.6192
58	*Myristica* sp.	7	19	1.0836
59	*Nephelium lappaceum* L.	1	3	0.1548
60	*Oroxylum indicum* (L) Kurz	1	3	0.1548
61	*Palaquium obovatum* (Griff.) Engl.	1	3	0.1548
62	*Palaquium sukoei* Fischer.	3	8	0.4644
63	*Pandanus odoratissimus* L.f.	10	27	1.5480
64	*Parkia leiophylla* Kurz	2	5	0.3096
65	*Payena paralleloneura* Kurz	1	3	0.1548
66	*Pentace griffithii* King	11	30	1.7028
67	*Phobe tavoyana* (Meissner) Hook.f.	23	62	3.5604
68	*Podocarpus neriifolius* D.Don	3	8	0.4644
69	*Psidium acidum* Mart	1	3	0.1548
70	*Schima wallichii* (DC.)Korth.	12	32	1.8576
71	*Shorea henryana* Pierre	34	92	5.2632
72	*Shorea* sp.	6	16	0.9288
73	*Stereospermum colais* (Buch.-Ham. Ex Dillwyn) Mabb.	14	38	2.1672
74	*Swintonia floribunda* Griff.	2	5	0.3096

75	*Syzygium buxifolium* Hook. & Arn.	28	76	4.3344
76	*Syzygium grande* (Wight)Walp	7	19	1.0836
77	*Syzygium* sp.(1)	7	19	1.0836
78	Taungpanthi	2	5	0.3096
79	*Terminalia chebula* Retz.	1	3	0.1548
80	*Ulmus lancifolia* Roxb.	2	5	0.3096
81	*Vatica dyeri* King	3	8	0.4644
82	*Wrightia arborea* (Dennst.) Mabb.	1	3	0.1548
83	*Xanthophyllum lanceatum (*Miq.)J.J.Sm.	2	5	0.3096
84	*Xanthophyllum virens* Roxb.	1	3	0.1548
	Total	**646**	**1746**	**100**

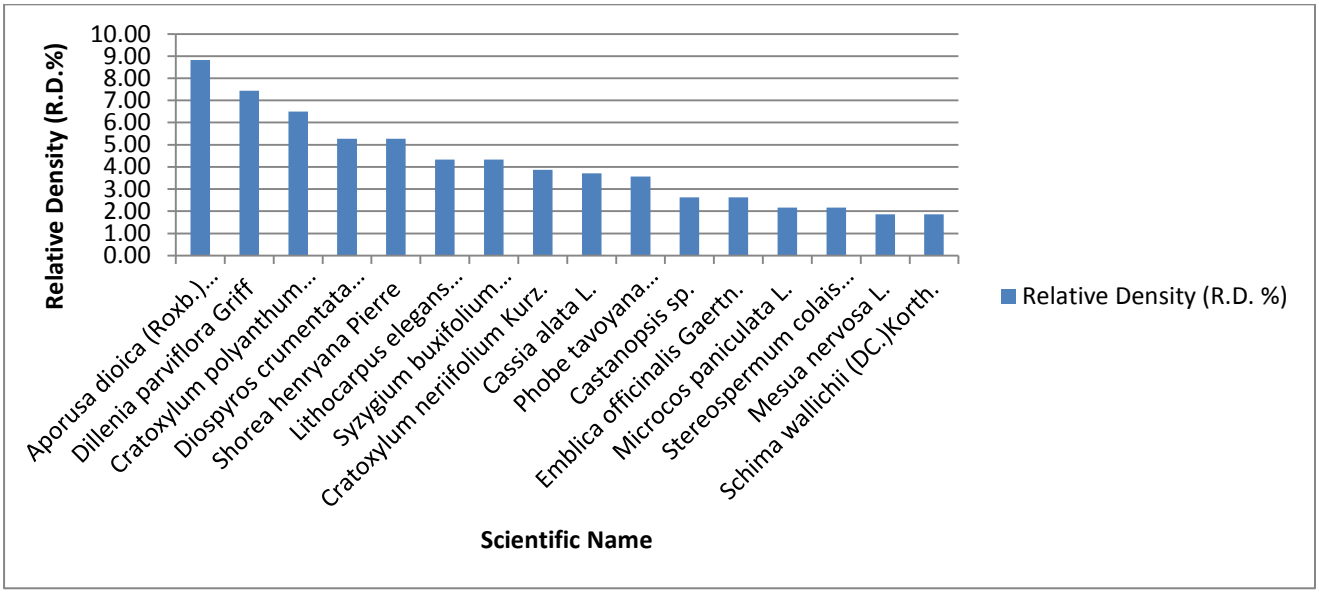
4.7.3 Relative density

Among the sample plots species density per hectare varied and the highest density was observed *Aporusa dioica* (Roxb.) Mull.Arg. followed by *Dillenia parviflora* Griff.This shows that these two species are abundant in this area.

No.	Scientific name	Density (D)	Relative Density (R.D. %)
1	*Aporusa dioica* (Roxb.) Mull.Arg.	7.125	8.823529412
2	*Dillenia parviflora* Griff	6	7.430340557
3	*Cratoxylum polyanthum* Korth.	5.25	6.501547988
4	*Diospyros crumentata* Thwaites	4.25	5.263157895
5	*Shorea henryana* Pierre	4.25	5.263157895
6	*Lithocarpus elegans* (Blume) Hatusima ex Saepadma	3.5	4.334365325
7	*Syzygium buxifolium* Hook. & Arn.	3.5	4.334365325
8	*Cratoxylum neriifolium* Kurz.	3.125	3.86996904
9	*Cassia alata* L.	3	3.715170279
10	*Phobe tavoyana* (Meissner)Hook.f.	2.875	3.560371517
11	*Castanopsis* sp.	2.125	2.631578947
12	*Emblica officinalis* Gaertn.	2.125	2.631578947
13	*Microcos paniculata* L.	1.75	2.167182663
14	*Stereospermum colais* (Buch.-Ham. Ex Dillwyn) Mabb.	1.75	2.167182663
15	*Mesua nervosa* L.	1.5	1.857585139
16	*Schima wallichii* (DC.)Korth.	1.5	1.857585139
17	*Pentace griffithii* King	1.375	1.702786378
18	*Cinnamomum pachyphyllum* Kosterm.	1.25	1.547987616

19	*Mitragyna parvifolia* (Roxb.) Korth.	1.25	1.547987616
20	*Pandanus odoratissimus* L.f.	1.25	1.547987616
21	*Eugenia oblata* Roxb.	1.125	1.393188854
22	*Anisoptera curtisii* Dyer	1	1.238390093
23	*Barringtonia cymosa* Fischer	1	1.238390093
24	*Chukrasia tabularis* A.Juss.	0.875	1.083591331
25	*Lagerstroemia speciosa* (L.)Pers.	0.875	1.083591331
26	*Myristica* sp.	0.875	1.083591331
27	*Syzygium grande* (Wight)Walp	0.875	1.083591331
28	*Syzygium* sp.(1)	0.875	1.083591331
29	*Crypteronia pubescens* Blume	0.75	0.92879257
30	*Melanorrhoea glabra* Wall.	0.75	0.92879257
31	*Shorea* sp.	0.75	0.92879257
32	*Firmiana colorata* (Roxb.)R.Br.	0.625	0.773993808
33	Litsea glutinosa (Lour.)C.B. Robins.	0.625	0.773993808
34	*Lophopetalum fimbriatum* Wight	0.5	0.619195046
35	*Myristica angustifolia* Roxb.	0.5	0.619195046
36	*Anisoptera oblonga* Dyer	0.375	0.464396285
37	*Barringtonia angusta* Kurz	0.375	0.464396285
38	*Dipterocarpus* sp.	0.375	0.464396285
39	*Erythrina suberosa* Roxb.	0.375	0.464396285
40	*Knema erratica*	0.375	0.464396285
41	*Lannea coromandelica* (Houtt.)Merr.	0.375	0.464396285
42	*Palaquium sukoei* Fischer.	0.375	0.464396285
43	*Podocarpus neriifolius* D.Don	0.375	0.464396285
44	*Vatica dyeri* King	0.375	0.464396285
45	*Actinodaphne* sp.(2)	0.25	0.309597523
46	*Avicennia officinalis* L.	0.25	0.309597523
47	*Chaetocarpus castanocarpus* Thwaites	0.25	0.309597523
48	*Cinnamomum nitidum* Blume	0.25	0.309597523
49	*Dipterocarpus grandiflorus* Blanco	0.25	0.309597523
50	*Garcinia speciosa* Kurz	0.25	0.309597523
51	*Heterophragma adenophylla* (Wall.) Seem. ex Benth. & Hook	0.25	0.309597523
52	*Lagerstroemia floribunda* Jack	0.25	0.309597523
53	*Parkia leiophylla* Kurz	0.25	0.309597523
54	*Swintonia floribunda* Griff.	0.25	0.309597523
55	Taungpanthi	0.25	0.309597523
56	*Ulmus lancifolia* Roxb.	0.25	0.309597523
57	*Xanthophyllum lanceatum (*Miq.)J.J.Sm.	0.25	0.309597523
58	*Achras zapota* L.	0.125	0.154798762

59	*Alstonia scholaris* (L.)R.Br	0.125	0.154798762
60	*Amoora wallichii* King	0.125	0.154798762
61	*Antidesma ghesaembilla* Gaertn.	0.125	0.154798762
62	*Ardisia colorata* Roxb.	0.125	0.154798762
63	*Bombax ceiba* L.	0.125	0.154798762
64	*Buchanania lanzan* Spreng.	0.125	0.154798762
65	*Callerya atropurpurea* (Wall.) Schot.	0.125	0.154798762
66	*Carallia brachiata* (Lour.)Merr.	0.125	0.154798762
67	*Careya arborea* Roxb.	0.125	0.154798762
68	*Chisocheton paniculatus* Hiern.	0.125	0.154798762
69	*Croton roxburghianus* N.P.Balakr	0.125	0.154798762
70	*Fluggea virosa* (Roxb.exWilld)Voigt	0.125	0.154798762
71	*Gardenia sootepensis* Hutch.	0.125	0.154798762
72	*Gonocaryum griffithianum* (Miers)Kurz	0.125	0.154798762
73	*Holarrhena pubescens* Wall.	0.125	0.154798762
74	*Licuala peltata* Roxb.	0.125	0.154798762
75	*Litsea grandis* (Nees) Hook.f	0.125	0.154798762
76	*Litsea laurifolia* (Jacq.)Kurz	0.125	0.154798762
77	*Nephelium lappaceum* L.	0.125	0.154798762
78	*Oroxylum indicum* (L) Kurz	0.125	0.154798762
79	*Palaquium obovatum* (Griff.) Engl.	0.125	0.154798762
80	*Payena paralleloneura* Kurz	0.125	0.154798762
81	*Psidium acidum* Mart	0.125	0.154798762
82	*Terminalia chebula* Retz.	0.125	0.154798762
83	*Wrightia arborea* (Dennst.) Mabb.	0.125	0.154798762
84	*Xanthophyllum virens* Roxb.	0.125	0.154798762



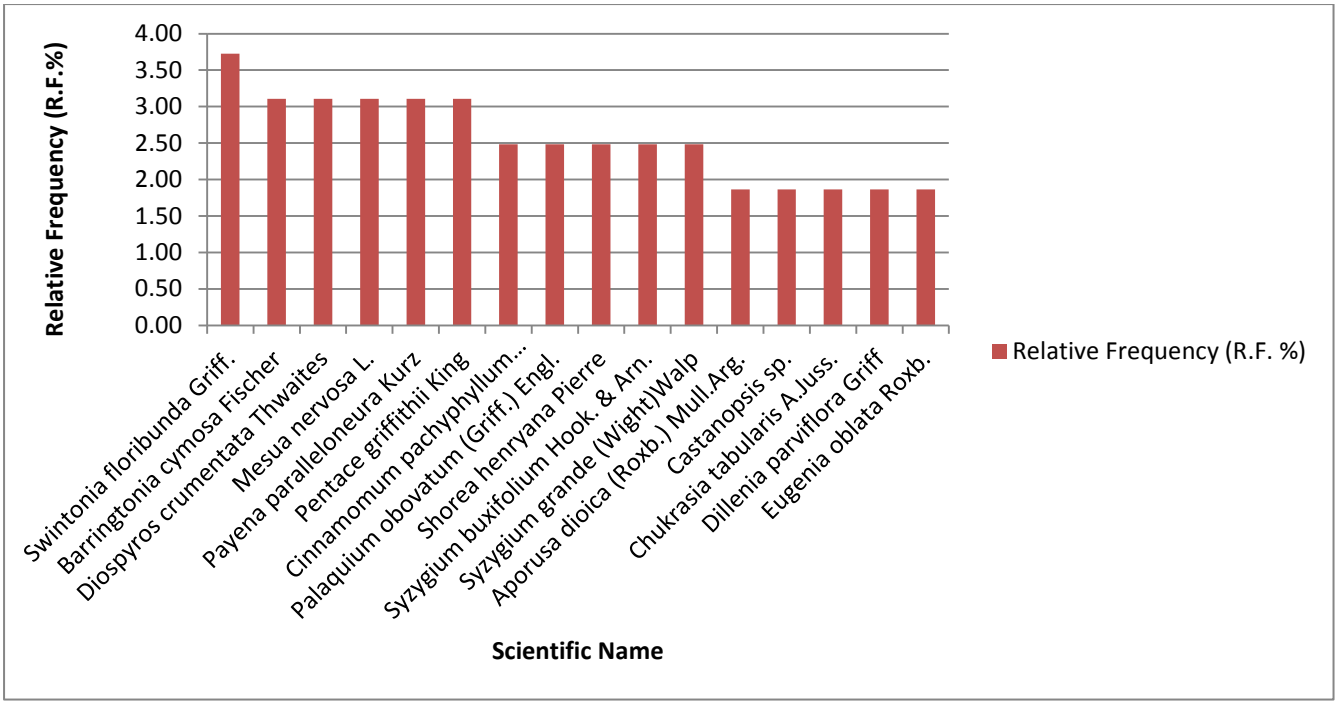
4.7.4 Relative frequency of Tree species

Relative frequency is the frequency of one species compared to the total frequency of all the species. According the results**,** *Swintonia floribunda* Griff., had high relative frequency value (3.7267%) followed by *Barringtonia cymosa* Fischer (3.1055%), *Diospyros crumentata* Thwaites (3.1055%), *Mesua nervosa* L. (3.1055%), *Payena paralleloneura* Kurz (3.1055%), *Pentace griffithii* King (3.1055%), and *Cinnamomum pachyphyllum* Kosterm. (2.4844%), and *Palaquium obovatum* (Griff.) Engl (2.4844%), respectively. Therefore these species occur everywhere in the study area.

No.	Scientific Name	Frequency (F)	Relative Frequency (R.F. %)
1	*Swintonia floribunda* Griff.	0.75	3.726708075
2	*Barringtonia cymosa* Fischer	0.625	3.105590062
3	*Diospyros crumentata* Thwaites	0.625	3.105590062
4	*Mesua nervosa* L.	0.625	3.105590062
5	*Payena paralleloneura* Kurz	0.625	3.105590062
6	*Pentace griffithii* King	0.625	3.105590062
7	*Cinnamomum pachyphyllum* Kosterm.	0.5	2.48447205
8	*Palaquium obovatum* (Griff.) Engl.	0.5	2.48447205
9	*Shorea henryana* Pierre	0.5	2.48447205
10	*Syzygium buxifolium* Hook. & Arn.	0.5	2.48447205
11	*Syzygium grande* (Wight)Walp	0.5	2.48447205
12	*Aporusa dioica (Roxb.) Mull.Arg.*	0.375	1.863354037
13	*Castanopsis* sp.	0.375	1.863354037
14	*Chukrasia tabularis* A.Juss.	0.375	1.863354037
15	*Dillenia parviflora* Griff	0.375	1.863354037
16	*Eugenia oblata* Roxb.	0.375	1.863354037
17	*Licuala peltata* Roxb.	0.375	1.863354037
18	*Melanorrhoea glabra* Wall.	0.375	1.863354037
19	*Myristica angustifolia* Roxb.	0.375	1.863354037
20	*Schima wallichii* (DC.)Korth.	0.375	1.863354037
21	*Shorea* sp.	0.375	1.863354037
22	*Actinodaphne* sp.(2)	0.25	1.242236025
23	*Anisoptera curtisii* Dyer	0.25	1.242236025

24	*Barringtonia angusta* Kurz	0.25	1.242236025
25	*Chaetocarpus castanocarpus* Thwaites	0.25	1.242236025
26	*Cinnamomum nitidum* Blume	0.25	1.242236025
27	*Cratoxylum neriifolium* Kurz.	0.25	1.242236025
28	*Cratoxylum polyanthum* Korth.	0.25	1.242236025
29	*Dipterocarpus grandiflorus* Blanco	0.25	1.242236025
30	*Dipterocarpus* sp.	0.25	1.242236025
31	*Emblica officinalis* Gaertn.	0.25	1.242236025
32	*Lophopetalum fimbriatum* Wight	0.25	1.242236025
33	*Microcos paniculata* L.	0.25	1.242236025
34	*Mitragyna parvifolia* (Roxb.) Korth.	0.25	1.242236025
35	*Palaquium sukoei* Fischer.	0.25	1.242236025
36	*Syzygium* sp.(1)	0.25	1.242236025
37	Taungpanthi	0.25	1.242236025
38	*Vatica dyeri* King	0.25	1.242236025
39	*Achras zapota* L.	0.125	0.621118012
40	*Alstonia scholaris* (L.)R.Br	0.125	0.621118012
41	*Amoora wallichii* King	0.125	0.621118012
42	*Anisoptera oblonga* Dyer	0.125	0.621118012
43	*Antidesma ghesaembilla* Gaertn.	0.125	0.621118012
44	*Ardisia colorata* Roxb.	0.125	0.621118012
45	*Avicennia officinalis* L.	0.125	0.621118012
46	*Bombax ceiba* L.	0.125	0.621118012
47	*Buchanania lanzan* Spreng.	0.125	0.621118012
48	*Callerya atropurpurea* (Wall.) Schot.	0.125	0.621118012
49	*Carallia brachiata* (Lour.)Merr.	0.125	0.621118012
50	*Careya arborea* Roxb.	0.125	0.621118012
51	*Cassia alata* L.	0.125	0.621118012
52	*Chisocheton paniculatus* Hiern.	0.125	0.621118012
53	*Croton roxburghianus* N.P.Balakr	0.125	0.621118012
54	*Crypteronia pubescens* Blume	0.125	0.621118012
55	*Erythrina suberosa* Roxb.	0.125	0.621118012
56	*Firmiana colorata* (Roxb.)R.Br.	0.125	0.621118012

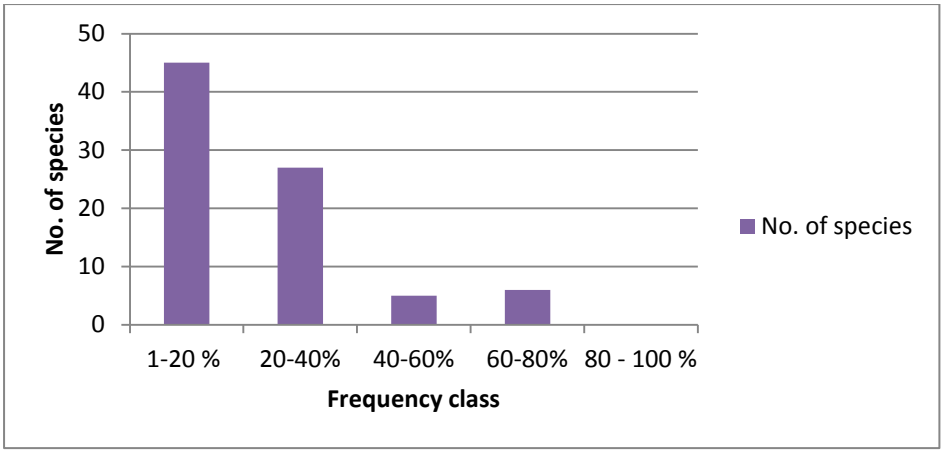
57	*Fluggea virosa* (Roxb.exWilld)Voigt	0.125	0.621118012
58	*Garcinia speciosa* Kurz	0.125	0.621118012
59	*Gardenia sootepensis* Hutch.	0.125	0.621118012
60	*Gonocaryum griffithianum* (Miers)Kurz	0.125	0.621118012
61	*Heterophragma adenophylla* (Wall.) Seem. ex Benth. & Hook	0.125	0.621118012
62	*Holarrhena pubescens* Wall.	0.125	0.621118012
63	*Knema erratica*	0.125	0.621118012
64	*Lagerstroemia floribunda* Jack	0.125	0.621118012
65	*Lagerstroemia speciosa* (L.)Pers.	0.125	0.621118012
66	*Lannea coromandelica* (Houtt.)Merr.	0.125	0.621118012
67	*Lithocarpus elegans* (Blume) Hatusima ex Saepadma	0.125	0.621118012
68	Litsea glutinosa (Lour.)C.B. Robins.	0.125	0.621118012
69	*Litsea grandis* (Nees) Hook.f	0.125	0.621118012
70	*Litsea laurifolia* (Jacq.)Kurz	0.125	0.621118012
71	*Myristica* sp.	0.125	0.621118012
72	*Nephelium lappaceum* L.	0.125	0.621118012
73	*Oroxylum indicum* (L) Kurz	0.125	0.621118012
74	*Pandanus odoratissimus* L.f.	0.125	0.621118012
75	*Parkia leiophylla* Kurz	0.125	0.621118012
76	*Phobe tavoyana* (Meissner) Hook.f.	0.125	0.621118012
77	*Podocarpus neriifolius* D.Don	0.125	0.621118012
78	*Psidium acidum* Mart	0.125	0.621118012
79	*Stereospermum colais* (Buch.-Ham. Ex Dillwyn) Mabb.	0.125	0.621118012
80	*Terminalia chebula* Retz.	0.125	0.621118012
81	*Ulmus lancifolia* Roxb.	0.125	0.621118012
82	*Wrightia arborea* (Dennst.) Mabb.	0.125	0.621118012
83	*Xanthophyllum lanceatum (*Miq.)J.J.Sm.	0.125	0.621118012
84	*Xanthophyllum virens* Roxb.	0.125	0.621118012



4.7.5 Species distribution by frequency class

In order to clarify the homogeneity and heterogeneity of the floristic distribution in the area, the species distribution by frequency class was examined. According to the outcome of the frequency classes, only eleven species are in intermediate frequency class and 72% of the species are in low frequency class. This shows that this area is floristically heterogeneous.

Frequency class	No. of species
1-20 %	45
20-40%	27
40-60%	5
60-80%	6
80 - 100 %	0



4.7.6 Vegetation types in the area

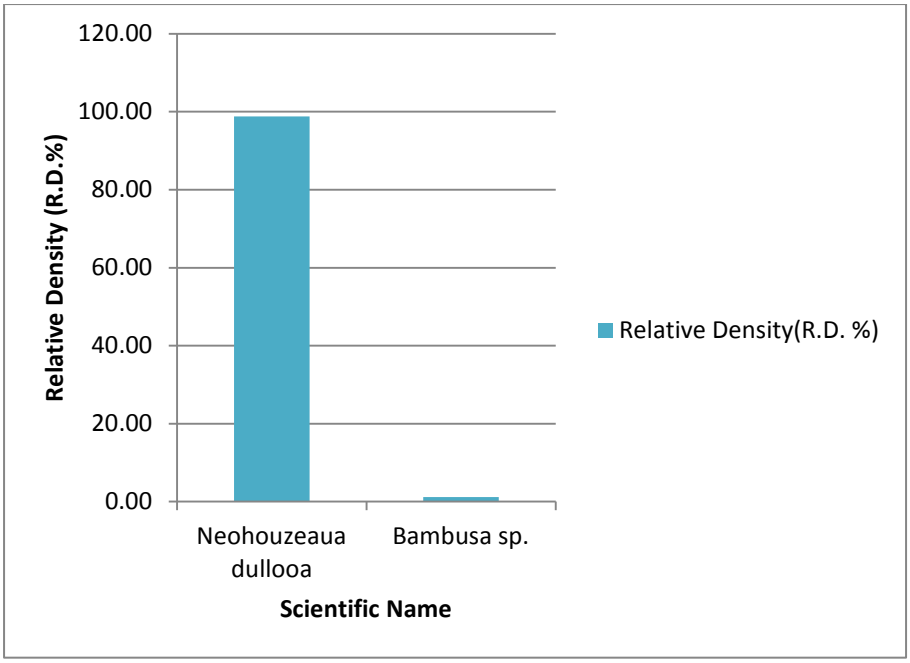
No.	Locality	Vegetation type	Latitude	Longitude	Altitude	Note
1.	Thitone pate hill top	Evergreen	N 14˚ 21' 33.1"	E 098˚ 14' 16.8"	385.8m	*Licuala peltata, Castanopsis* sp., *Diospyros crumentata, Pentace griffithii, Shorea* sp., *Phobe tavoyana, Swintonia floribunda, Schima wallichii, Syzygium grande, Syzygium buxifolium,*
2.	Thitone pate Mountain Range	Evergreen	N 14˚ 21' 54.5"	E 098˚ 14' 09.3"	395.1m	
3.	Yetagon Mountain Range & Kyaukphyu Track	Evergreen	N 14˚ 20' 47.2"	E 098˚ 15' 50.6"	349.5m	
4.	Yangon Pyan Mountain Range	Evergreen	N 14˚ 20' 90.3"	E 098˚ 15' 78.7"	478.5m	
5.	Yepu Mountain Range	Semi-evergreen	N 14˚ 21' 46.1"	E 098˚ 14' 61.7"	311.1m	*Schima wallichii, Licuala peltata, Swintonia floribunda, Payena paralleloneura, Lithocarpus elegans, Diospyros crumentata, Shorea* sp. *Chukrasia,tabularis, Syzygium* sp.(1),
6.	Yepu Mountain Range	Semi-evergreen	N 14˚ 21' 26.7"	E 098˚ 14' 69.5"	306.9m	
7.	Near Nut Hine Stream	Deciduous	N 14˚ 20' 06.7"	E 098˚ 15' 04.9"	86.7m	*Dillenia parviflora, Aporosa octandra Cassia alata, Psidium acidum, Cratoxylum polyanthum, Cratoxylum neriifolium, Aporosa octandra Mitragyna parvifolia*
8.	Between Nut Hine Stream & Yetagon Stream	Deciduous	N 14˚ 19' 95.3"	E 098˚ 15' 13.3"	82.5m	

4.7.7 Bamboo Species Population

No.	Scientific Name	No. of individual	Total no. of individual/ha	Total no. of population/ ha (%)
1	*Bambusa* sp.	4	31	1.19760479
2	*Neohouzeaua dullooa*	330	2538	98.80239521
	Total	**334**	**2569**	**100**

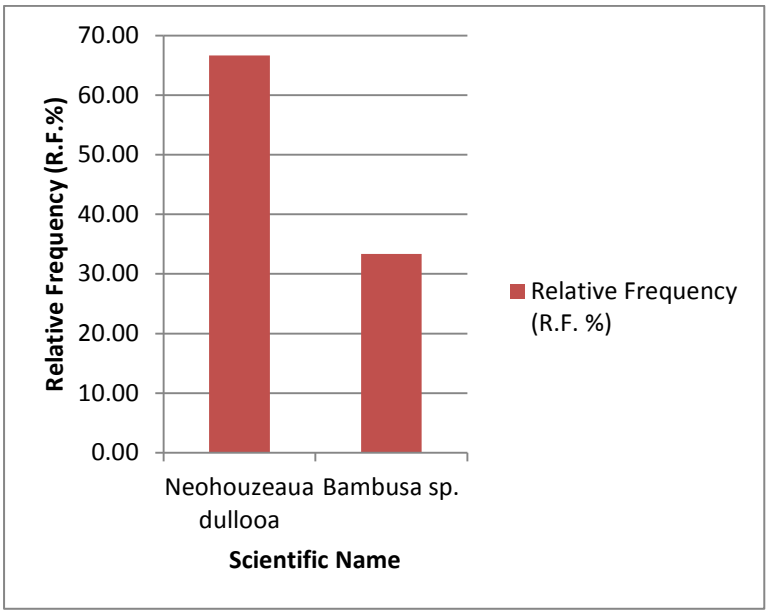
4.7.8. Relative density

No.	Scientific Name	Density (D)	Relative Density (R.D. %)
1	*Neohouzeaua dullooa*	165	98.80239521
2	*Bambusa* sp.	2	1.19760479



4.7.9 Species distribution

No.	Scientific Name	Frequency (F)	Relative Frequency (R.F. %)
1	*Neohouzeaua dullooa*	1	66.66666667
2	*Bambusa* sp.	0.5	33.33333333



4.7.10 Discussion

A total of 84 species belonging to 70 genera were analyzed in the study area. The main vegetation types in this area can be grouped into three formations i.e. evergreen forest, mixed deciduous, deciduous forest and bamboo forest. The secondary forests are also found near bamboo forest. The leading dominant species are *Licuala peltata, Castanopsis* sp., *Diospyros crumentata, Pentace griffithii, Shorea* sp., *Schima wallichii, Licuala peltata, Dillenia parviflora, Aporosa octandra, Licuala peltata* and *Castanopsis* sp. are highest in frequency so that these species are said to be common in this area. The dominant bamboo species *Bambusa* sp. and *Neohouzeaua dullooa* and these two species are also in highest in frequency.The rare species *Illicium verum* (Star anise) was found in this area. This species is endemic to China and found in the highland areas.

The forests in this area show some types of disturbance. The illegal logging is appearent in this areas (see photo). The canopy of the forest is more or less closed. The canopy layer is dominated by *Castanopsis* sp. (Baik-gyan), *Schima wallichii* (Thit-ya), *Shorea* sp.(Hput-ma-tet), *Anisoptera scaphula* (Roxb.) and *Pavetta indica* L.(Myet-na-pan). The emergent tree species are *Parashorea* sp.(Ka-dut-phyu), *Anisoptera scaphula* (Kaung-mu), *Eugenia oblate* (tha-bye-ni), *Syzygium* sp.(Tha-bye-phyu) and *Anisoptera costata* (Kaban-bok). *Anisoptera sp., Shorea sp., Eugenia sp. and Syzygium sp. are* in low frequency. Hence these species are rare species. The presence of some secondary forests shows the influence of human impacts on the forest.

4.8 Endangered tree species in the study area according to IUCN list

No.	ID	Scientific name	Family name	Vernacular name	IUCN criteria
1.	62	*Aglaia grandis*	Meliaceae	Not known	LR/nt
2.	143	*Anisoptera costata* Korth.	Dipterocarpaceae	Kaban-bok	EN A1 cd + 2 cd
3.	144	*Anisoptera curtisii* Dyer	Dipterocarpaceae	Ka-ban	CR A1 cd + 2 cd
4.	150	*Anisoptera scaphula* (Roxb.) Pierre	Dipterocarpaceae	Kaung-mu	CR A1 cd + 2 cd
5.	402	*Dalbergia cultrata* Grah.	Fabaceae	Yin-daik	EN A1 cd
6.	439	*Diospyros crumentata* Thwaites	Ebenaceae	Taung-bok	EN B1 + 2cd
7.	469	*Dipterocarpus alatus* Roxb.	Dipterocarpaceae	Kanyin-phyu	EN A1 cd +2cd, B1 +2c
8.	482	*Dipterocarpus costatus* Gaertn. f.	Dipterocarpaceae	Kanyin-ywet thay	EN A1 cd +2cd
9.	495	*Dipterocarpus grandiflorus* Blanco	Dipterocarpaceae	Kanyin-byan	CR A1 cd +2cd
10.	512	*Dipterocarpus tuberculatus* Roxb.	Dipterocarpaceae	Kanyin- ni	CR A1 cd +2cd
11.	859	*Hopea helferi* (Dyer) Brandis	Dipterocarpaceae	Kyauk-thingan	CR A1 cd +2cd,B1 + 2c
12.	880	*Hopea odorata* Roxb.	Dipterocarpaceae	Thin-gan	VU A1 cd + 2cd
13.	899	*Hopea sangal* Korth.	Dipterocarpaceae	Thin-gan-ma-	CRA1cd, B1 +

				ka-lay	2c,C1,D
14.	1295	*Memecylon grande* Retz.	Melastomataceae	Taung-phyu	VU 1c,B1 + 2c
15.	1391	*Myristica malabarica* Lan.	Myristicaceae	Kywe-thwee-ywet-thay	VU B1 + 2c
16.	1539	*Parashorea stellata* Kurz.	Dipterocarpaceae	Ka-dut-net	CRA 1cd, B1 + 2c
17.	1697	*Schima wallichii* (DC.)Korth.	Theaceae	Thit-ya	UV B1 + 2c, D2
18.	1731	*Shorea assamica* Dyer	Dipterocarpaceae	Me-chaung-kyee	CR A1cd, B1+2c
19.	1769	*Shorea farinosa* Fisher	Dipterocarpaceae	U-ban	CRA1 cd, C2a
20.	1778	*Shorea gratissima* Dyer	Dipterocarpaceae	Bankaya	EN A1 cd,C2a
21.	1782	*Shorea henryana* Pierre	Dipterocarpaceae	Banthangyin	EN A1 cd

LR= Lower Risk

EN= Endangered

CR=Critically Endangered

VU=Vulnerable

5. GENERAL DISCUSSION AND CONCLUSION

The area of Taninthayi Nature Reserve encompasses 1700 square kelometers (657 square miles) or 170,000 hectare (420,070 acre). The size of this area is largest compare to the protected areas existing in Thailand within the same ecoregion, Tenasserim-South Thailand Simi-evergreen Rain Forest. This ecoregion covers the transition zone from continental dry evergreen forest common in the north to semi-evergreen rain forest to the south. The mountainous semievergreen rain forest of northern portion of the Tenasserin Range separates Thailand and Myanmar and also separates Indochina and Malesia.

The vegetation includes both lowland and mountain forests. The diverse habitats within this ecoregion form deciduous forest in the north to seasonal evergreen forests in the south, lowland to montane and make it one of the richest flora and fauna especially for birds and mammals.

Unfortunatly, most of the areas in Nature Reserve have been difficult for effective assessment at this time due to political situation of the region. Only 10% to 20% of the areas have been permitted to explore. Present study demarcates seven accessable area in the Nature Reserve as Service Track area, Kyaukshat area, Yebone area, Heinze area, Nhankye area, Oakthayan Junction area and Kalontar Aishae area in accordance with the administrative area of the Nature Reserve. All together 40 sample plots in seven designated area, were carried out for tree species survey and 23 sample plots for bamboo species. Total of 384 tree species and 30 bamboo species were recorded (Appendix I). The herbarium specimens of some rare and endemic species and photographs of all specimens are taken and submitted to the TNRP.

The comparison of composition of tree species among 1926-1936 survey by H.C Smith, 2007 survey by U Hla Maung Thein and present survey was carried out to know the changes of land cover over time (Appendix II). It was found that *Altingia excelsa* Noronha (Hnin-pa-yoke), *Xylia xylocarpa* (Roxb.) Taub. (Pyin-ka-do), *Michelia champaca* L. (San-ga, Sa-ga-wa), *Albizia lebbek* (L.) Benth. (Kokko), *Dillenia indica* L. (Tha-byu), *Hopea odorata* Roxb. (Thin-gan), *Pentace burmanica* Kurz. (Thit-kha), *Toona ciliate* M.Roemer (Thit-ka-doe), *Schima noronhae* (Thit-pyauk, Kayothat) recorded as larger in population by Smith are very rare and if present only one or two specimans are found in the areas concerned. *Anisoptera curtisii* Dyer (Ka-ban), *Anisoptera scaphula* (Roxb.) Pierre (Kaung-mu), *Dipterocarpus* sp. (Ka-nyin), *Cinnamomum multiflorum* Wight (Karawe, Ka-ra-phwe) and *Lagerstroemia* sp. (Pyin-ma) are small quantity in population. *Swintonia floribunda* Griff. (Shit-lae), *Amoora wallichii* King (Gat-ni), *Syzygium claviflorum* (Roxb.)A.M. Cowan & Cowan (Tha-bye) are common and larger quantity in population. *Swintonia floribunda* Griff. was found to be largest frequency in all the studied area and largest population in Nhan-kye area, Kyauk-shat area and Heinze area and it was also recorded as largest population by Smith also. The changes in tree species composition of the forests are appearent. The composition of list of ten species at present is much different from that of Smith, 85 years ago (see appendix III). Only four species *Swintonia floibunda* (Shitle), *Syzygium claviflorum* (Tha-bye), *Dipterocarpus* sp. (ka-nyin) and *Dillenia* sp. (Thabyu, Zinbyum) are found to be abundance at present. *Anisoptera* sp. (kaban, Kaungmu, Banbok), *Dipterocarpus* sp. (Kanyin) and *Hopea* sp. (Thingan) were larger in population in Smith's record but very rare in the present time.These species were recorded as endangered species by IUCN (Table). Therefore if community forest, agroforest or reforestration are practiced, these species should be considered as the first priority.It is also needed to conserve not only the endangered species but also the species with low frequency class since these species are locally rare species.

The forest types in the study area vary from dense hill evergreen in the high lands and evergreen or semievergreen in the low slopes to mixed deciduous, deciduous and degraded secondary forest in the low lands.The evergreen forest are found in Nhankye area, Oakthayan Junction area and kalontar area.The dominant species are *Aporosa* sp., *Diospyros* sp., *Castanopsis* sp., *Lithocarpus* sp., *Pentace* sp., *Swintonia floribunda* and *Syzygium* sp.The deciduous forests and secondary forests are abundant in human disturbed area especially in service tract area, Kyaukshat area, Yebone area and Heinze area. The dominant tree species in the deciduous forests and riverine secondary forests are *Chukrasia tabularis, Odophea* sp., *Amoora* sp, *Aporosa* sp., *Dipterocarpus* sp., *Myristica* sp., *Nephelium* sp.and *Schima wallichii.*

The dominant bamboo species are *Bambusa* sp. and *Neohauzeaua dullooa* which are the only two species growing in the bamboo forest of Kalontar area, Oakthayan Junction area and Nhankye area. *Dendroclamus* sp. *and Schizostachyum* sp. *and Cephalostachyum vigatum* (Wabogyi) which are in low frequency, are the rare species so that these species should be conserved.

The forests in the study area are under high pressure due to its usefulness in many aspects. At present, the impacts affecting the ecology of the study areas are encroachments

for logging, hunting and plantations, seasonal fire, erosion, landslides and seasonal strong wind due to storms. These disturbances are very sensitive to dynamic processes, species diversity, community structure, population development and habitats of the wildlife. These may lead to the deteriorating and breaking down the web life of ecosystem which may lead to the extinction of species.

The foot prints found near Yepu steam in Kalontar area are archaeologically high in value (see photos). It may be the archaeological heritage of Myanmar. It should be informed to Archaeology Department for further study.

Neolithic foot prints and an archic pond near Yepu stream in Kalontar study side

6. RECOMMENDATION

The present study would indicate the rare and commom species in the area and contribute the potential species to conserve and to manage the wildlife habitat. The high species density indicates the uniqueness and potentiality of the area for conservation.High frequency shows the common species and low frequency shows the rare species. If the higher propotion of the species in low frequency class which indicates the number of rare species, is much more than common species, the area is a heterogenous community in terms of species compositon.Hence, more attention is needed to control the disturbances in the area,otherwise the rare species may decline leading to reduction of individuals or local extinction.

During field trip, it was learnt that in Kalontar area the fosilised foot prints of Neolithic man with foot prints of his child still existed near Yepu stream. The photographs of the foot prints were taken for evidence.This finding should inform to archaeology department for further study.

According to field survey and interview with the villagers, it is learnt that there is illegal logging and illegal border trade. Human trafficking especially young girls and cattle trafficking (photo) along 'Yoe-da-yar Road' in Heinze area is still practicing at present time.This terrible trafficking should be stoped in any means. It is also learnt that local residents extracted mainly timber, as well as fire wood, bamboo, rattan and local medicinal plants. They are also still practicing hunting and fishing in the TNR area.Therefore, to solve this problem, serious consideration should be undertaken to help the local residents in terms

of alternative way of livelihood.The community based management programs such as community forestry and agroforestry esterblishments, preventive measure of monocultural plantation and creation of income generation for socio-economic development of local community should be implemented.

This assessment would be too difficult to generalize the whole Taninthayi Nature Reserve.It hopes that the present findings and suggestions would be the indicators for the future management plan for conservation.

Cattle trafficking along 'Yoe-da-yar Road' in Heinze area

7. LIST OF APPENDICES

Appendix I Checklist List of Tree Species

No.	Scientific Name	Vernacular Name	Family Name
1	*Achras zapota* L.	Tha-gya	Sapotaceae
2	*Acrocarpus fraxiniflorum* Wight ex Arn.	Thit-noat	Caesalpiniaceae
3	*Actinodaphne* sp. (1)	Kyeze-nawin-wa	Lauraceae
4	*Actinodaphne* sp.(2)	Kyeze-ywet-thay	Lauraceae
5	*Adenanthera pavonina* L.	Ywe-gyi	Mimosaceae
6	*Aesculus hippocastanum*	Not known	Hippocastanaceae
7	*Aglaia andamanica* Hiern	Gat-thit-to	Meliaceae
8	*Aglaia grandis*	Not known	Meliaceae
9	*Aglaia lawii*	Not known	Meliaceae
10	*Aglaia* sp.(1)	Kyauk-phya	Meliaceae
11	*Aglaia* sp.(2)	Not known	Meliaceae
12	*Ailanthus triphysa* (Dennst.) Alston	Not known	Simaroubaceae
13	*Alangium chinense* (Lour.)Harms	Kant-that-pin	Alangiaceae
14	*Albizia chinensis* (Osbeck) Merr.	Poza	Mimosaceae
15	*Albizia lebbek* (L.) Benth.	Taw-kokko	Mimosaceae
16	*Albizia odoratissima* (L.f.) Benth.	Taung-magyi	Mimosaceae
17	*Albizia procera* (Roxb.) Benth.	Sit-pin	Mimosaceae
18	*Alphonsea boniana* Fint & Gagnep	Not known	Annonaceae
19	*Alstonia rostrata*Fischer	Myet-na-pan-po	Apocynaceae
20	*Alstonia scholaris* (L.)R.Br	Taung-ka-lar	Apocynaceae
21	*Altingia excelsa* Noronha	Hnin-pa-yok	Hamamelidaceae
22	*Amoora rohituka* Wight & Arn.	Gat-pok	Meliaceae
23	*Amoora* sp.	Magyi-me	Meliaceae
24	*Amoora wallichii* King	Gat-ni	Meliaceae
25	*Anisoptera costata* Korth.	Kaban-bok	Dipterocarpaceae
26	*Anisoptera curtisii* Dyer	Ka-ban	Dipterocarpaceae
27	*Anisoptera oblonga* Dyer	Ban-shwe-wa	Dipterocarpaceae
28	*Anisoptera scaphula* (Roxb.) Pierre	Kaung-mu	Dipterocarpaceae
29	*Anisoptera* sp.	Ba-tha	Dipterocarpaceae
30	*Anneslea fragrans* Wall.	Pan ma	Theaceae
31	*Anthocephalus morindaefolius* Korth.	Ma-u	Rubiaceae
32	*Antiaris toxicaria* (Pers.) Lesch.	Hmya-seik	Moraceae
33	*Antidesma ghesaembilla* Gaertn.	Chin-pa-lan	Euphorbiaceae

34	*Aporosa roxburghii* Baill.	Thit-khauk	Euphorbiaceae
35	*Aporosa villosa*Bail.	Thit-khauk	Euphorbiaceae
36	*Aporosa villosula* Kurz.	Thit-khauk	Euphorbiaceae
37	*Aporusa dioica* (Roxb.) Mull.Arg.	Thit-khauk	Euphorbiaceae
38	*Aralia montana* Blume	Hti-po-pha	Araliaceae
39	*Archidendron jiringa*(Jack)Nielsen	Da-nyin	Mimosaceae
40	*Ardisia colorata* Roxb.	Kyet-ma-oak	Myrtaceae
41	*Areca triandra* Roxb.	Taw-kun-thi	Arecaceae
42	*Arenga saccharifera* Labill.	Yaechinpin	Arecaceae
43	*Artocarpus chaplasha* Roxb.	Taung-peinne	Moraceae
44	*Artocarpus heterophyllus* Lam.	Peinne	Moraceae
45	*Artocarpus lakoocha* Roxb.	Myauk-lok	Moraceae
46	*Atalantia monophylla* A.DC.	Taw-shauk	Rutaceae
47	*Avicennia officinalis* L.	Maga	Avicenniaceae
48	*Baccaurea sapida* Muell.Arg.	Bonmapa	Euphorbiaceae
49	*Barringtonia acutangula* (L.)Gaertn.	Ye-kyi	Lecythidaceae
50	*Barringtonia angusta*Kurz	Kalagyi-ywet-thay	Lecythidaceae
51	*Barringtonia cymosa* Fischer	Kalagi-ywet-gyi	Lecythidaceae
52	*Bauhinia malabarica* Roxb.	Chin-byit	Caesalpiniaceae
53	*Bauhinia purpurea* L.	Swe-daw	Caesalpiniaceae
54	*Bauhinia sulphurea* Fischer	Swe-daw	Caesalpiniaceae
55	*Bhesa robusta* (Roxb.) Ding Hou	Gu bok	Celastraceae
56	*Bombax anceps* Pierre	Not known	Bombacaceae
57	*Bombax ceiba* L.	Letpan	Bombacaceae
58	*Bombax*sp.	Not known	Bombacaceae
59	*Bouea burmanica* Griff	Taw-mayan	Anacardiaceae
60	*Brassaiopsis* sp.	Not known	Araliaceae
61	*Bridelia* sp.	Seik-chi	Euphorbiaceae
62	*Buchanania lanzan* Spreng.	Lun-san-pin	Anacardiaceae
63	*Buddleja asiatica* Lour.	Kyaung-migo	Buddlejaceae
64	*Callerya atropurpurea* (Wall.) Schot.	Kywe-danyin	Fabaceae
65	*Calophyllum kunstleri* King	Kalaphi	Hypericaceae
66	*Carallia brachiata* (Lour.)Merr.	Yat	Rhizophoraceae
67	*Careya arborea*Roxb.	Ban-bwe	Lecythidaceae
68	*Carpinus londoniana*	Not known	Betulaceae
69	*Caryota mitis* Lour.	Min-baw	Arecaceae

70	*Cassia alata* L.	Pwe-gaing	Caesalpiniaceae
71	*Cassia fistula* L.	Phwer-htet or Ngu	Caesalpiniaceae
72	*Castanopsis argyrophylla* King	Thit-ta	Fagaceae
73	*Castanopsis rhamnifolia* A.DC.	Wet-thitcha	Fagaceae
74	*Castanopsis sp.*	Bigyan	Fagaceae
75	*Castanopsis tribuloides* A.DC.	Wet-thitcha	Fagaceae
76	*Catunaregan* sp.	Not known	Rubiaceae
77	*Chaetocarpus castanocarpus* Thwaites	Hman-par	Euphorbiaceae
78	*Chionanthus ramiflora* Roxb.	Taw-gan-kaw	Oleaceae
79	*Chisocheton divergens* Blume.	Gat-ywet-thay	Meliaceae
80	*Chisocheton paniculatus* Hiern.	Gat-phyu	Meliaceae
81	*Chisocheton siamensis*	Not known	Meliaceae
82	*Chukrasia tabularis* A.Juss.	Taw-yin-ma	Meliaceae
83	*Chukrasia velutina*	Not known	Meliaceae
84	*Cinnamomum caudatum*Nees.	Karaway-yaing	Lauraceae
85	*Cinnamomum multiflorum* Wight	Ka-ra-phwe	Lauraceae
86	*Cinnamomum nitidum* Blume	Na-lin-gyaw	Lauraceae
87	*Cinnamomum pachyphyllum* Kosterm.	Hman-thin	Lauraceae
88	*Cinnamomum* sp. (1)	Karaway-yaing	Lauraceae
89	*Cnestis ramiflora* Griff.	Thit-saku	Connaraceae
90	*Crateva magna* (Lour.)DC.	Ka-det	Capparaceae
91	*Cratoxylum cochinchinense*	Let-tan-pin	Hypericaceae
92	*Cratoxylum neriifolium* Kurz.	Mat-pe-ni	Hypericaceae
93	*Cratoxylum polyanthum*Korth.	Mat-pe-phyu	Hypericaceae
94	*Croton joufra* Roxb.	Thet-yin-gale	Euphorbiaceae
95	*Croton roxburghianus* N.P.Balakr	Thet-yin-gyi	Euphorbiaceae
96	*Crypteronia pubescens*Blume	Young-pin	Crypteroniaceae
97	*Cyathea gigantea*	Tree ferns	Cyatheaceae
98	*Cycas pectinata* Buch.-ham.	Medon pin	Cycadaceae
99	*Dalbergia cultrata* Grah.	Yin-daik	Fabaceae
100	*Dalbergia rimosa* Roxb.	Not known	Fabaceae
101	*Dalbergia sisoo* Roxb.	Taung-pa-dauk	Fabaceae
102	*Dalbergia stipulacea* Roxb.	Thit-ma-gyi	Fabaceae
103	*Decaspermum graciclentum* (Hance.) Merr.& L. M. Perry	Not known	Myrtaceae
104	*Derris* sp.	Ohn-za	Fabaceae
105	*Desmos chinensis* Lour	Saing swe	Annonaceae

106	*Desmos cochinchinensis* Lour.	Not known	Annonaceae
107	*Dialium indum* L.	Taung-kaye	Caesalpiniaceae
108	*Dillenia indica* L.	Tha-byu	Dilleniaceae
109	*Dillenia parviflora* Griff	Zin-byun	Dilleniaceae
110	*Dillenia scabrellia* Roxb.	Kyet-zin-byun	Dilleniaceae
111	*Diospyros crumentata* Thwaites	Taung-bok	Ebenaceae
112	*Diospyros dasyphylla* Kurz	Not known	Ebenaceae
113	*Diospyros dictyoneura* Hiern.	Thit-ka-net	Ebenaceae
114	*Diospyros peregrine* (Gaertn.)Gurke	Bok-pin	Ebenaceae
115	*Diospyros undulata* var. *cratericalyx*	Bok-gyan	Ebenaceae
116	*Dipterocarpus alatus* Roxb.	Kanyin-phyu	Dipterocarpaceae
117	*Dipterocarpus costatus* Gaertn. f.	Kanyin-ywet thay	Dipterocarpaceae
118	*Dipterocarpus grandiflorus* Blanco	Kanyin-byan	Dipterocarpaceae
119	*Dipterocarpus obtusifolius* Teysm.	Ka-nyin	Dipterocarpaceae
120	*Dipterocarpus tuberculatus* Roxb.	In	Dipterocarpaceae
121	*Dipterocarpus turbinatus* Gaertn.f.	Kanyin-ni	Dipterocarpaceae
122	*Dracontomelon dao* (Blume) Merr. & Rolfe	Taung-tamar or Magapho	Anacardiaceae
123	*Drimycarpus racemosus* Hook. f.	Thise-bo	Anacardiaceae
124	*Duabanga grandiflora* Walp	Myauk-ngo	Lythraceae
125	*Dysoxylum cochinchinensis* Pierre	Not known	Meliaceae
126	*Dysoxylum grande* Hiern	Gat-ywet-sok	Meliaceae
127	*Dysoxylum procerum* Hiern	Gat-pwe-baung	Meliaceae
128	*Elaeocarpus petiolatus* (Jack) Wall.	Taung-pyin-phet	Elaeocarpaceae
129	*Emblica officinalis* Gaertn.	Zi-phyu	Euphorbiaceae
130	*Engelhardtia spicata* Blume	Pwint-set	Juglandaceae
131	*Erythrina suberosa*Roxb.	Taung-ka-thit	Fabaceae
132	*Eugenia oblata* Roxb.	Thabye-ni	Myrtaceae
133	*Eugenia* sp.(1)	Tha-bye-o-kale	Myrtaceae
134	*Euonymus javanicus* Blume	Thit-kya-bo	Celastraceae
135	*Fagraea fragrans* Roxb.	Ahnyin	Loganiacceae
136	*Ficus annulata* Blume	Nyaung-tha-pan	Moraceae
137	*Ficus benjamina* L.	Nyaung	Moraceae
138	*Ficus callosa*Willd.	Nyaung-yar	Moraceae
139	*Ficus chartacea* Wall.	Tha-phan	Moraceae
140	*Ficus glomerata* Roxb.	Ye-tha-phan	Moraceae
141	*Ficus hirta* L.	Not known	Moraceae

142	*Ficus hispida* L.	Ka-aung	Moraceae
143	*Ficus lacor* Buch.-Ham.	Nyaung-gyin	Moraceae
144	*Ficus microcarpa*	Not known	Moraceae
145	*Ficus obtusifolia* Roxb.	Nyaung-kyat	Moraceae
146	*Ficus pisocarpa*	Not known	Moraceae
147	*Ficus racemosa* L.	Tha-phan	Moraceae
148	*Ficus semicordata* Buch.-Ham. ex J.E.Sm.	Ka-dut	Moraceae
149	*Ficus* sp.(1)	Not known	Moraceae
150	*Ficus* sp.(2)	Nyaung	Moraceae
151	*Ficus* sp.(3)	Tha-phan	Moraceae
152	*Firmiana colorata* (Roxb.) R.Br.	Wet-shaw	Sterculiaceae
153	*Flacourtia cataphracta Roxb.*	Let-put-thi	Flacourtiaceae
154	*Flacourtia indica*	Let put thi	Flacourtiaceae
155	*Flacourtia jangomas* (Lour.)Raeusch.	Kyet-yo	Flacourtiaceae
156	*Flueggea virosa* (Roxb. Ex Willd.)Voigt	Ye-chin-ya	Euphorbiaceae
157	*Garcinia cowa* Roxb.	Taung-thale	Hypericaceae
158	*Garcinia heterandra* Wall.	Taw-min-gut	Hypericaceae
159	*Garcinia merguensis* Wight	Ginsin	Hypericaceae
160	*Garcinia pedunculata* Roxb.	Kywe-thone-baung/Met-lin	Hypericaceae
161	*Garcinia* sp.	Not known	Hypericaceae
162	*Garcinia speciosa* Kurz	Ba-wa	Hypericaceae
163	*Gardenia erythroclada* Kurx	Khar-yar-pin	Rubiaceae
164	*Gardenia sessiliflora* Wall.	Ma-gyi-bauk	Rubiaceae
165	*Gardenia sootepensis* Hutch.	Yin-gat	Rubiaceae
166	*Gelonium multiflorum* A.Juss	Ka-thi-ta	Euphorbiaceae
167	*Glochidion rubrum*	Hta-minsok	Euphorbiaceae
168	*Gluta tavoyana* Wall.	Tha-yet-che (Taung Thayet)	Anacardiaceae
169	*Gluta usitata*	Not known	Anacardiaceae
170	*Glycosmis pentaphylla* (Retz.)A.DC.	Taw-sauk-pin	Rutaceae
171	*Gmelina arborea* Roxb.	Ye-ma-ne	Verbenaceae
172	*Gnetum gnemon* L.	Lin-kaw	Gnetaceae
173	*Gonocaryum griffithianum* (Miers)Kurz	Wun-the-gye	Icacinaceae
174	*Grewia lacei* J. R.Drumin. ex Craib.	Not known	Tiliaceae
175	*Grewia laevigata* Vahl	Ta-yaw	Tiliaceae
176	*Haldina cordiflolia*	Not known	Rubiaceae

177	*Harpullia cupanioides* Roxb.	Bawa	Sapindaceae
178	*Helicia reticulata* W.T.Wang	Not known	Proteaceae
179	*Heritiera javanica* (Blume) Kosterm.	Kanzo	Sterculiaceae
180	*Heteropanax fragrans* (Roxb. ex. DC.)Seem.	Kyaung-shar-bo	Araliaceae
181	*Heterophragma adenophylla* (Wall.) Seem. ex Benth. & Hook.	Phet-than	Bignoniaceae
182	*Hibiscus macrophyllus*	Yar-mar	Malvaceae
183	*Holarrhena pubescens* Wall.	Let-htoke-gyi	Apocynaceae
184	*Homalium grandiflorum* Benth.	Thit-wa	Flacourtiaceae
185	*Homalium tomentosum* Benth.	Myauk-chaw	Flacourtiaceae
186	*Homonoia riparia* Lour	Gyin-yee	Euphorbiaceae
187	*Hopea helferi* (Dyer) Brandis	Kyauk-thingan	Dipterocarpaceae
188	*Hopea odorata* Roxb.	Thin-gan	Dipterocarpaceae
189	*Hopea sangal* Korth.	Thin-gan-ma-ka-lay	Dipterocarpaceae
190	*Hydnocarpus* sp.	Khet-lan	Flacourtiaceae
191	*Illicium verum*	Lay-nyin	Illiciaceae
192	*Irvingia malayana* Oliver	Tha-gya-phyu	Irvingiaceae
193	*Ixora* sp.(1)	Not known	Rubiaceae
194	*Ixora* sp.(2)	Masonetaywet - sonetaywet	Rubiaceae
195	*Knema erratica*	Kywe-thwe	Myristicaceae
196	*Knema furfurce*	Not known	Myristicaceae
197	*Lagerstroemia floribunda* Jack	Pyin-ma-phyu/ Hmun-ye-gye	Lythraceae
198	*Lagerstroemia macrocarpa* Kurz	Pyin-ma-ywet-gyi	Lythraceae
199	*Lagerstroemia speciosa* (L.)Pers.	Pyin-ma-ywet-thay	Lythraceae
200	*Lagerstroemia tomentosa* Presl.	Le-za	Lythraceae
201	*Lannea coromandelica* (Houtt.)Merr.	Lan-fe	Anacardiaceae
202	*Laportea crenulata* Gaud.	Pet-ya	Uritcaceae
203	*Leea indica* Merr.	Naga-mauk	Leeaceae
204	*Leea macrophylla* Roxb.	Kyar-phet-gyi	Leeaceae
205	*Licuala peltata*Roxb.	Sa-lu	Arecaceae
206	*Lindera caudata* (Nees) Hook.f.	Not known	Lauraceae
207	*Lithocarpus elegans* (Blume) Hatusima ex Saepadma	Bi-gyan	Fagaceae
208	*Lithocarpus fenstratus* (Roxb.)Rehd.	Baik-gyan-ywet-gyi	Fagaceae
209	*Lithocarpus garretianus*	Not known	Fagaceae
210	*Lithocarpus lappaceus*(Roxb.)Rehd.	Thit-cha	Fagaceae

211	*Lithocarpus sootepensis*	Not known	Fagaceae
212	*Lithocarpus* sp.(1)	Not known	Fagaceae
213	*Lithocarpus* sp.(2)	Not known	Fagaceae
214	*Litsea glutinosa* (Lour.)C.B. Robins.	Ta-gu	Lauraceae
215	*Litsea grandis* (Nees) Hook.f	Ta-gu-yo-ni	Lauraceae
216	*Litsea laurifolia* (Jacq.)Kurz	On-don	Lauraceae
217	*Litsea monopetala* (Roxb.)Pers	Ta-gu-ywet-thay	Lauraceae
218	*Litsea salicifolia* (Nees) Hook.f	Hta-min-char	Lauraceae
219	*Litsea* sp. (1)	Not known	Lauraceae
220	*Livistona speciosa* Kurz	Taung-htan	Arecaceae
221	*Lophopetalum fimbriatum* Wight	Yan-mye-ni	Celastraceae
222	*Macaranga denticulate* Muell. Arg.	Phet-wun	Euphorbiaceae
223	*Macaranga gigantea*	Not known	Euphorbiaceae
224	*Macaranga siamensis*	Not known	Euphorbiaceae
225	*Maesa indica* Wall.	Nwar-pin	Myrsinaceae
226	*Maesa paniculata* A.DC.	Nwar-pin	Myrsinaceae
227	*Maesa ramentacea* A.DC.	Nwar-pin	Myrsinaceae
228	*Magnolia liliifera* (L.)Bail.	Bauk-san-ga	Annonaceae
229	*Mallotus barbatus*	Not known	Euphorbiaceae
230	*Mallotus oblongifolius*	Phet-wun-lae	Euphorbiaceae
231	*Mangifera caloneura* Kurz	Taw-tha-yet	Anacardiaceae
232	*Mangifera sylvatica* Roxb.	Taw-tha-yet	Anacardiaceae
233	*Markhamia stipulata* (Wall.)Seem. ex K. Schum.	Ma-hlwa	Bignoniaceae
234	*Melanorrhoea glabra* Wall.	Thit-si	Anacardiaceae
235	*Memecylon grande* Retz.	Taung-phyue	Melastomataceae
236	*Mesua nervosa* L.	Taung-gangaw-yaing	Hypericaceae
237	*Mesua* sp.	Not known	Hypericaceae
238	*Michelia champaca* L.	San-ga	Magnoliaceae
239	*Michelia* sp.	San-ga-hmwe	Magnoliaceae
240	*Microcos paniculata* L.	Phaw-pha-thi	Tiliaceae
241	*Micromelum minutum* (G.Forst.) Wight & Am.	Not known	Rutaceae
242	*Millingtonia hortensis* L.f.	Egayit	Bignoniaceae
243	*Mishocarpus pentapetalus* (Roxb.) Radik.	Not known	Sapindaceae
244	*Mitragyna parvifolia* (Roxb.) Korth.	Bin-ga	Rubiaceae
245	*Morinda angustifolia* Roxb.	Bu-pin or Yeyo	Rubiaceae

246	*Morinda tinctoria* Roxb.	Ni-ba-sae	Rubiaceae
247	*Morus laevigata* Wall.	Poe-sa-pin	Moraceae
248	*Myristica angustifolia* Roxb.	Kywe-thwe-ni	Myristicaceae
249	*Myristica conferta* King	Kywe-thwe-khaunlong	Myristicaceae
250	*Myristica malabarica* Lan.	Kywe-thwe-ywet-thay	Myristicaceae
251	*Myristica* sp.	Mauk-kha-yar	Myristicaceae
252	*Nauclea orientalis* L.	U-kha	Rubiaceae
253	*Nauclea sessilifolia* Roxb.	Thit-pa-yaung	Rubiaceae
254	*Nephelium lappaceum*L.	Kyet-mauk-wa or Taw-kyet-mauk	Sapindaceae
255	*Nephelium* sp.	Kyet-mauk-ni	Sapindaceae
256	*Nothaphoebe umbelliflora*	Not known	Lauraceae
257	*Ochna integerrima*	Ye-nyaung	Ochnaceae
258	*Olax scandens* Roxb.	Not known	Olacaceae
259	*Ormosia watsonii* Fisch	Lezin	Fabaceae
260	*Orophea* sp.	Not known	Annonaceae
261	*Oroxylum indicum* (L) Kurz	Kyaung-sha	Bignoniaceae
262	*Pajanelia longifolia* (Will.)K.Schum.	Kyaung dauk	Bignoniaceae
263	*Palaquium obovatum* (Griff.) Engl.	Panle-byin-ywet-gyi	Sapotaceae
264	*Palaquium sukoei* Fischer.	Panle-byin-ywet-thay (ni)	Sapotaceae
265	*Pandanus foetidus* Roxb.	Not known	Pandanaceae
266	*Pandanus odoratissimus* L.f.	Gyit-pin	Pandanaceae
267	*Parashorea* sp.(1)	Ka-dut-phyu	Dipterocarpaceae
268	*Parashorea stellata* Kurz.	Ka-dut-net	Dipterocarpaceae
269	*Parkia leiophylla* Kurz	Shan-da-nyin/ Hnin-twe-le	Mimosaceae
270	*Pavetta indica* L.	Myet-na-pan	Rubiaceae
271	*Payena oleifera* Watt.	Kan-zwe	Sapotaceae
272	*Payena paralleloneura* Kurz	Zin-zwe	Sapotaceae
273	*Pentace burmanica* Kurz	Thit-kha	Tiliaceae
274	*Pentace griffithii* King	Thit-sho	Tiliaceae
275	*Persea gamblei*	Not known	Lauraceae
276	*Persea macrantha* (Nees)Kostermans	Not known	Lauraceae
277	*Phoebe cathia*	Not known	Lauraceae
278	*Phoebe lanceolata* (Nees) Nees	Kyaung-yi	Lauraceae
279	*Phoebe paniculata* (Nees)Nees	Taung-ka-nyin	Lauraceae
280	*Phoebe sp.*	Kyeze-ywet-sok	Lauraceae

281	*Phoebe tavoyana* (Meissner) Hook.F.	Kye-ze	Lauraceae
282	*Phyllanthus albizzioides* (Kurz)Hook.f.	Shit-kha	Euphorbiaceae
283	*Podocarpus neriifolius* D.Don	Ye-thit-min	Podocarpaceae
284	*Podocarpus wallichianus Presl*	Thit-min	Podocarpaceae
285	*Polyalthia hookeriana* King	Bok	Annonaceae
286	*Polyalthia simiarum* Benth. & Hook. f . ex Hook.f.	Bok-ywet-thay	Annonaceae
287	*Polyalthia* sp.	Taw-saga-sein	Annonaceae
288	*Polyalthia viridis*	Not known	Annonaceae
289	*Pongamia pinnata* Pierre	Thin-win-phyu	Fabaceae
290	*Prema bengalensis* C.B. Clarke	Kyun-lan	Verbenaceae
291	*Prema integrifolia* L.	Taung-tangyi	Verbenaceae
292	*Psidium acidum Mart*	Ma-la-kar-chin	Myartaceae
293	*Pterocarpus macrocarpus* Kurz	Pa-dauk	Fabaceae
294	*Pterocymbium macranthum* Kosterm.	Taw-po-sa	Sterculiaceae
295	*Pterocymbium* sp.	Moe-pin	Sterculiaceae
296	*Pterospermum acerifolium* Willd.	Not known	Sterculiaceae
297	*Pterospermum semisagittatum* Buch-Ham	Nwa-labyin	Sterculiaceae
298	*Pterostermum grandiflorum*	Not known	Sterculiaceae
299	*Putranjiva roxburghii* Wall.	Dauk-yat	Euphorbiaceae
300	*Quercus semiserrata* Roxb.	Not known	Fagaceae
301	*Quercus spicata* Smith.	Not known	Fagaceae
302	*Rinorea* sp.	Taw-ok-shit	Violaceae
303	*Rothmannia sootepensis*	Not known	Rubiaceae
304	*Salacca wallichiana* Mart.	Yin-ngan	Arecaceae
305	*Salix tetrasperma* Roxb.	Moe-ma-kha	Salicaceae
306	*Sandoricum koetjape* (Burm.f.) Merr.	Thit-to	Meliaceae
307	*Sapium baccatum* Roxb.	Taung-yaw	Euphorbiaceae
308	*Sapium indicum*Willd.	Bon lon	Euphorbiaceae
309	*Sapium insigne* (Muell.Arg.)Trimen	Sut-chat	Euphorbiaceae
310	*Saurauia napaulensis*	Not known	Saurauiaceae
311	*Saurauia* sp.	Not known	Saurauiaceae
312	*Schima wallichii* (DC.)Korth.	Thit-ya	Theaceae
313	*Senna timoriensis* (DC.) Irwin & Bameby	Taw-me-za-li	Caesalpiniaceae
314	*Shorea assamica* Dyer	Me-chaung-kyee	Dipterocarpaceae
315	*Shorea cinerea* Fischer	Ka-dut	Dipterocarpaceae
316	*Shorea farinosa* Fisher	U-ban	Dipterocarpaceae

317	*Shorea gratissima* Dyer	Ban-ka-ya	Dipterocarpaceae
318	*Shorea henryana* Pierre	Ban-than-gyin	Dipterocarpaceae
319	*Shorea* sp.	Hput-ma-tet	Dipterocarpaceae
320	*Spondias pinnata* (L.)Kurz.	Bwe-baung	Anacardiaceae
321	*Sterculia balanghas* L.	Not known	Sterculiaceae
322	*Sterculia foetida* L.	Let-khok	Sterculiaceae
323	*Sterculia lanceolata*	Not known	Sterculiaceae
324	*Sterculia pexa*	Not known	Sterculiaceae
325	*Sterculia versicolor* Wall.	Shaw-phyu	Sterculiaceae
326	*Sterculia villosa*Roxb.	Shaw-ni/shaw-don	Sterculiaceae
327	*Stereospermum colais* (Buch.-Ham. Ex Dillwyn) Mabb.	Than-thit	Bignoniaceae
328	*Stereospermum fimbriatum*	Than-de	Bignoniaceae
329	*Streblus asper* Lour.	On-hne	Moraceae
330	*Streblus taxoides* (K.Henye)Kurz	Ye-onhne	Moraceae
331	*Suregada multiflora*	Not known	Euphorbiaceae
332	*Swintonia floribunda* Griff.	Shit-lae	Anacardiaceae
333	*Symplocos racemosa*Roxb.	Not known	Symplocaceae
334	*Symplocos* sp.	Not known	Symplocaceae
335	*Symplocos sumuntia* Buch.-Ham.	Taw-thit-khauk	Symplocaceae
336	*Syzygium albiflorum* (Duthie & Kurz) Bahadur&R.C.Gaur.	Not known	Myrtaceae
337	*Syzygium buxifolium* Hook. & Arn.	Tha-bye-htat-ta-ya	Myrtaceae
338	*Syzygium cerasoides* (Roxb.) Raiz.	Tha-bye-gyin	Myrtaceae
339	*Syzygium claviflorum* (Roxb.)A.M.Cowan &Cowan	Tha-bye	Myrtaceae
340	*Syzygium grande* (Wight)Walp	Tha-bye-ywet-gyi	Mytaceae
341	*Syzygium gratum* (Wight)S.N.Mitra	Tha-bye-pauk-pauk	Myrtaceae
342	*Syzygium polyanthum* (Wight)Merr.&L.M.Perry	Taung malaka	Myrtaceae
343	*Syzygium* sp.(1)	Tha-bye-phyu	Myrtaceae
344	*Syzygium* sp.(2)	Tha-bye-khun-pya	Myrtaceae
345	*Syzygium* sp.(3)	Kyauk-tha-bye	Myrtaceae
346	*Taliparitimacrophyllum* (Roxb. ex Hornem.) Fryxell	Phet-wun-gyi	Malvaceae
347	*Tamarindus indica* L.	Magyi	Caesalpiniaceae
348	*Tarennoidea wallichii* (Hook.f.) D. Tivengadum & Sastre	Khet-mya	Rubiaceae
349	*Tectona grandis* L.f.	Kyun	Verbenaceae
350	*Terminalia alata* (Heyne)Roth	Not known	Combretaceae

351	*Terminalia bellerica* Roxb.	Thit-seint	Combretaceae
352	*Terminalia catappa* L.	Banda	Combretaceae
353	*Terminalia chebula* Retz.	Phan-kha	Combretaceae
354	*Terminalia* sp.(1)	Not known	Combretaceae
355	*Tetrameles nudiflora* R.Br.	Than-phu	Datiscaceae
356	*Theobroma* sp.(1)	Thit-me	Sterculiaceae
357	*Toona ciliata* M.Roemer	Thit-ka-doe	Meliaceae
358	*Trachycarpus oreophilus*	Taw-htan	Arecaceae
359	*Trema orientalis* L.	Kywe-sha	Ulmaceae
360	*Trevesia palmata* (Roxb. Ex Lind.) Vis	Hpaw	Araliaceae
361	*Tristania merguensis* Griff.	Mya-ga-mon	Myrtaceae
362	*Tristaniopsis burmanica* (Griff.)P.G.Wilsan & J.T.Waterh.	Taung-tha-bye	Myrtaceae
363	*Tristaniopsis* sp.	Taung-pyin-po	Myrtaceae
364	*Ulmus lancifolia* Roxb.	Sar-phyu	Ulmaceae
365	*Vaccinium donianum* Wight.	Not known	Ericaceae
366	*Vangueria pubescens*	Kyet-tet-su	Rubiaceae
367	*Vatica dyeri* King	Kanyin-kyaung-chae	Dipterocarpaceae
368	*Vernonia* sp.	Not known	Asteraceae
369	*Vitex coriacea* C.B.Clarke	Kyet-yo	Verbenaceae
370	*Vitex peduncularis* Wall.	Pazin-nyo	Verbenaceae
371	*Wendlandia glabrata* DC.	Taung-byin	Rubiaceae
372	*Wrightia arborea* (Dennst.) Mabb.	Seik-noe	Apocynaceae
373	*Xanthophyllum lanceatum* (Miq.)J.J.Sm.	Thit-phyu	Polygalaceae
374	*Xanthophyllum virens* Roxb.	Choyin	Polygalaceae
375	*Xerospermum noronhianum* (Blume)Blume	Kyet-mauk	Sapindaceae
376	*Xylia xylocarpa* (Roxb.) Taub.	Pyin-ka-doe	Mimosaceae
377	*Zanthoxylum rhetsa* (Roxb.) DC.	Ka-thit-phyu	Rutaceae
378	*Ziziphus mauritiana*	Myauk-zi	Rhamnaceae
379	*Ziziphus rugosa* Lam	Taw-zi	Rhamnaceae
380		Pan-yeik-dyi	Tiliaceae
381		Shit-sho-shit-pyit	
382		Taung-pan-thi	
383			Leguminosae
384			Annonaceae

Summary of Tree Species List

No.	Categories	Amount
1.	No. of family	78
2.	No. of Identified family	382
3.	No. of Indentified species	379
4.	No. of Unidentified but known local name	2
5.	No. of Unidentified species	5
6.	Total number of species	384

Checklist of Bamboo Species

No.	Scientific Name	Vernacular Name	Family Name
1	*Bambusa affinis*	Wa-net, Waya	Poaceae
2	*Bambusa binghami* Gamble	Kya-khat-wa	"
3	*Bambusa blumeana*	Not known	"
4	*Bambusa heterostachya*	Not known	"
5	*Bambusa laxa*	Wabwe, Wabyauk	"
6	*Bambusa multiplex*	Waphyu-gale, Waphyu-san, Sin-midu	"
7	*Bambusa oliveriana*	Wa-ba, Wa-kha, Wa-byauk	"
8	*Bambusa* sp.	Byaw-wa	"
9	*Bambusa tuldoides*	Not known	"
10	*Cephalostachyum virgatum*	Wabo-gyi	"
11	*Dendrocalamus brandisii*	Not known	"
12	*Dendrocalamus giganteus*	Hmyin-wa, Wa-pyu	"
13	*Dendrocalamus hirtellus*	Not known	"
14	*Dendrocalamus longispathus*	Wabo, Kyalo-wa, Wa-payaung	"
15	*Dendrocalamus membranceus*	Hmyin-ba	"
16	*Dendrocalamus strictus*	Not known	"
17	*Dendrochloa distans*	Thaiktu-hmyintu	"
18	*Gigantochloa apus*	Dawe-wa	"
19	*Gigantochloa hasskarliana*	Kamyin-wa, Tabin-daing-wa	"
20	*Gigantochloa nigrociliata*	Wa-do	"
21	*Maclurochloa* sp.	Zoo-wa	"
22	*Neohouzeaua dullooa*	Zum-wa	"
23	*Neohouzeaua tavoyan*	Not known	"
24	*Oxytenanthera parvifolia*	Not known	"
25	*Pseudooxyenanthera monadelpha*	Not known	"
26	*Racemobambos congesta*	Not known	"
27	*Schizostachyum blumei*	Not known	"
28	*Schizostachyum grande*	Not known	"
29	*Schizostachyum kurzii*	Not known	"
30	*Schizostachyum zollingeri*	Not known	"

Appendix II Index of comparison tree species composition

No.	Scientific Names	Vernacular Name	Recent	1926 - 1936	2007
1	*Achras zapota* L.	Tha-gya	√	✗	√
2	*Acrocarpus fraxiniflorum* Wight ex Arn.	Thit-noat	√	✗	√
3	*Actinodaphne* sp. (1)	Kyeze-nawin-wa	√	✗	√
4	*Actinodaphne* sp.(2)	Kyeze-ywet-thay	√	√	√
5	*Adenanthera pavonina* L.	Ywe-gyi	√	✗	✗
6	*Aesculus hippocastanum*	Not known	√	✗	✗
7	*Aglaia andamanica* Hiern	Gat-thit-to	√	√	√
8	*Aglaia grandis*	Not known	√	✗	✗
9	*Aglaia lawii*	Not known	√	✗	✗
10	*Aglaia* sp.(1)	Kyauk-phya	√	✗	✗
11	*Aglaia* sp.(2)	Not known	√	✗	✗
12	*Ailanthus triphysa* (Dennst.) Alston	Not known	√	✗	✗
13	*Alangium chinense* (Lour.)Harms	Kant-that-pin	√	✗	√
14	*Albizia chinensis* (Osbeck) Merr.	Poza	√	✗	√
15	*Albizia lebbek* (L.) Benth.	Kokko	√	√	√
16	*Albizia odoratissima* (L.f.) Benth.	Taung-magyi	√	✗	✗
17	*Albizia procera* (Roxb.) Benth.	Sit-pin	√	✗	✗
18	*Alphonsea boniana* Fint & Gagnep	Not known	√	✗	✗
19	*Alstonia rostrata* Fischer	Myet-na-pan-po	√	✗	√
20	*Alstonia scholaris* (L.)R.Br	Taung-ka-lar	√	✗	√
21	*Altingia excelsa* Noronha	Hnin-pa-yok	√	√	✗
22	*Amoora rohituka* Wight & Arn.	Gat-pok	√	✗	√
23	*Amoora* sp.	Magyi-me	√	✗	√
24	*Amoora wallichii* King	Gat-ni	√	✗	√
25	*Anisoptera costata* Korth.	Kaban-bok	√	√	√
26	*Anisoptera curtisii* Dyer	Ka-ban	√	✗	√
27	*Anisoptera oblonga* Dyer	Ban-shwe-wa	√	√	✗
28	*Anisoptera scaphula* (Roxb.) Pierre	Kaung-mu	√	√	√
29	*Anisoptera* sp.	Ba-tha	√	✗	✗
30	*Anneslea fragrans* Wall.	Pan ma	√	✗	✗
31	*Anthocephalus morindaefolius* Korth.	Ma-u	√	✗	✗
32	*Antiaris toxicaria* (Pers.) Lesch.	Hmyaseik	√	✗	✗
33	*Antidesma ghesaembilla* Gaertn.	Chin-pa-lan	√	✗	✗
34	*Vaccinium donianum* Wight.	Not known	√	✗	✗
35	*Aporosa roxburghii* Baill.	Thit-khauk	√	√	√
36	*Aporosa villosa* Bail.	Thit-khauk	√	✗	✗
37	*Aporosa villosula* Kurz.	Thit-khauk	√	√	√
38	*Aporusa dioica* (Roxb.) Mull.Arg.	Thit-khauk	√	✗	✗
39	*Aralia montana* Blume	Hti-po-pha	√	✗	✗
40	*Archidendron jiringa* (Jack)Nielsen	Da-nyin	√	✗	✗
41	*Ardisia colorata* Roxb.	Kyet-ma-oak	√	✗	✗

42	*Areca triandra* Roxb.	Taw-kun-thi	√	א	א
43	*Arenga saccharifera* Labill.	Yae-chin-pin	√	א	√
44	*Artocarpus chaplasha* Roxb.	Taung-peinne	√	א	√
45	*Artocarpus heterophyllus* Lam.	Peinne	√	א	א
46	*Artocarpus lakoocha* Roxb.	Myauk-lok	√	√	√
47	*Atalantia monophylla* A.DC.	Taw-shauk	√	א	א
48	*Avicennia officinalis* L.	Maga	√	א	א
49	*Baccaurea sapida* Muell.Arg.	Bon-ma-pa	√	√	√
50	*Barringtonia acutangula* (L.)Gaertn.	Ye-kyi	√	א	√
51	*Barringtonia angusta* Kurz	Kalagyi-ywet-thay	√	√	√
52	*Barringtonia cymosa* Fischer	Kalagi-ywet-gyi	√	√	√
53	*Bauhinia malbarica* Roxb.	Chin-byit	√	א	√
54	*Bauhinia purpurea* L.	Swe-daw	√	א	א
55	*Bauhinia sulphurea* Fischer	Swe-daw	√	א	א
56	*Bhesa robusta* (Roxb.) Ding Hou	Gu bok	√	א	√
57	*Bombax anceps* Pierre	Not known	√	א	א
58	*Bombax ceiba* L.	Letpan	√	א	א
59	*Bombax* sp.	Not known	√	א	א
60	*Bouea burmanica* Griff	Taw-mayan	√	√	√
61	*Brassaiopsis* sp.	Not known	√	א	א
62	*Bridelia* sp.	Seik-chi	√	א	א
63	*Buchanania lanzan* Spreng.	Lun-san-pin	√	א	א
64	*Buddleja asiatica* Lour.	Kyaung-migo	√	א	א
65	*Callerya atropurpurea* (Wall.) Schot.	Kywe-danyin	√	א	√
66	*Calophyllum kunstleri* King	Ka-la-phi	√	√	√
67	*Carallia brachiata* (Lour.)Merr.	Yat	√	√	√
68	*Careya arborea* Roxb.	Ban-bwe	√	√	√
69	*Carpinus londoniana*	Not known	√	א	א
70	*Caryota mitis* Lour.	Min-baw	√	א	א
71	*Cassia alata* L.	Pwe-gaing	√	א	א
72	*Cassia fistula* L.	Phwer-htet or Ngu	√	א	√
73	*Castanopsis argyrophylla* King	Thit-e	√	א	√
74	*Castanopsis rhamnifolia* A.DC.	Wet-thitcha	√	א	√
75	*Castanopsis* sp.	Bi-gyan	√	א	√
76	*Castanopsis tribuloides* A.DC.	Wet-thitcha	√	א	א
77	*Catunaregan* sp.	Not known	√	א	א
78	*Chaetocarpus castanocarpus* Thwaites	Hman-par	√	א	√
79	*Chionanthus ramiflora* Roxb.	Taw-gan-kaw	√	א	א
80	*Chisocheton divergens* Blume.	Gat-ywet-thay	√	א	א
81	*Chisocheton paniculatus* Hiern.	Gat-phyu	√	√	√
82	*Chisocheton siamensis*	Not known	√	א	א
83	*Chukrasia tabularis* A.Juss.	Taw-yin-ma	√	א	א
84	*Chukrasia velutina*	Not known	√	א	א
85	*Cinnamomum caudatum* Nees.	Karaway-yaing	√	א	א

86	*Cinnamomum multiflorum* Wight	Ka-ra-phwe	√	א	√
87	*Cinnamomum nitidum* Blume	Na-lin-gyaw	√	א	√
88	*Cinnamomum pachyphyllum* Kosterm.	Hman-thin	√	א	√
89	*Cinnamomum* sp. (1)	Karaway-yaing	√	א	א
90	*Cnestis ramiflora* Griff.	Thit-saku	√	א	א
91	*Crateva magna* (Lour.) DC.	Ka-det	√	א	א
92	*Cratoxylum cochinchinense*	Let-tan-pin	√	א	א
93	*Cratoxylum neriifolium* Kurz.	Mat-pe-ni	√	א	√
94	*Cratoxylum polyanthum* Korth.	Mat-pe-phyu	√	א	א
95	*Croton joufra* Roxb.	Thet-yin-gale	√	√	√
96	*Croton roxburghianus* N.P. Balakr	Thet-yin-gyi	√	√	√
97	*Crypteronia pubescens* Blume	Young-pin	√	√	א
98	*Cyathea gigantea*	Tree ferns	√	א	א
99	*Cycas pectinata* Buch.-Ham.	Medon pin	√	א	א
100	*Dalbergia cultrata* Grah.	Yin-daik	√	א	√
101	*Dalbergia rimosa* Roxb.	Not known	√	א	א
102	*Dalbergia sisoo* Roxb.	Taung-pa-dauk	√	א	√
103	*Dalbergia stipulacea* Roxb.	Thit-ma-gyi	√	א	√
104	*Decaspermum graciclentum* (Hance.) Merr.& L. M. Perry	Not known	√	א	א
105	*Derris* sp.	Ohnza	√	א	√
106	*Desmos chinensis* Lour	Saing swe	√	א	א
107	*Desmos cochinchinensis* Lour.	Not known	√	א	א
108	*Dialium indum* L.	Taung-kaye	√	א	√
109	*Dillenia indica* L.	Tha-byu	√	√	א
110	*Dillenia parviflora* Griff	Zin-byun	√	√	√
111	*Dillenia scabrellia* Roxb.	Kyet-zin-byun	√	√	א
112	*Diospyros crumentata* Thwaites	Taung-bok	√	א	√
113	*Diospyros dasyphylla* Kurz	Not known	√	א	א
114	*Diospyros dictyoneura* Hiern.	Thit-ka-net	√	א	א
115	*Diospyros peregrine* (Gaertn.) Gurke	Bokpin	√	א	√
116	*Diospyros undulata* Wall.	Aukchin	√	√	א
117	*Dipterocarpus alatus* Roxb.	Kanyin-phyu	√	√	√
118	*Dipterocarpus costatus* Gaertn. f.	Kanyin-ywet thay	√	א	√
119	*Dipterocarpus grandiflorus* Blanco	Kanyin-byan	√	√	√
120	*Dipterocarpus obtusifolius* Teysm.	Ka-nyin	√	√	√
121	*Dipterocarpus tuberculatus* Roxb.	In	√	√	√
122	*Dipterocarpus turbinatus* Gaertn.f.	Kanyin-ni	√	א	√
123	*Dracontomelon dao* (Blume) Merr. & Rolfe	Taung-tamar/Magapho	√	א	√
124	*Drimycarpus racemosus* Hook. f.	Thise-bo	√	א	א
125	*Duabanga grandiflora* Walp	Myauk-ngo	√	א	√
126	*Dysoxylum cochinchinensis* Pierre	Not known	√	א	א
127	*Dysoxylum grande* Hiern	Gat-ywet-sok	√	√	√
128	*Dysoxylum procerum* Hiern	Gatpwebaung	√	א	√
129	*Elaeocarpus petiolatus* (Jack) Wall.	Taung-pyin-phet	√	√	א

130	*Emblica officinalis* Gaertn.	Zi-phyu	√	✗	√
131	*Engelhardtia spicata* Blume	Pwint-set	√	✗	√
132	*Erythrina suberosa* Roxb.	Taung-ka-thit	√	✗	✗
133	*Eugenia oblata* Roxb.	Thabye-ni	√	√	√
134	*Eugenia*sp.(1)	Tha-bye-o-kale	√	✗	√
135	*Euonymus javanicus* Blume	Thit-kya-bo	√	✗	√
136	*Fagraea fragrans* Roxb.	Ahnyin	√	√	✗
137	*Ficus annulata* Blume	Nyaung-tha-pan	√	✗	✗
138	*Ficus benjamina* L.	Nyaung	√	✗	✗
139	*Ficus callosa* Willd.	Nyaung-yar	√	✗	✗
140	*Ficus chartacea* Wall.	Tha-phan	√	✗	✗
141	*Ficus glomerata* Roxb.	Ye-tha-phan	√	✗	√
142	*Ficus hirta* L.	Not known	√	✗	✗
143	*Ficus hispida* L.	Ka-aung	√	✗	√
144	*Ficus lacor* Buch.-Ham.	Nyaung-gyin	√	✗	✗
145	*Ficus microcarpa*	Not known	√	✗	✗
146	*Ficus obtusifolia* Roxb.	Nyaung-kyat	√	✗	√
147	*Ficus pisocarpa*	Not known	√	✗	✗
148	*Ficus racemosa* L.	Tha-phan	√	✗	✗
149	*Ficus semicordata* Buch.-Ham. ex J.E.Sm.	Ka-dut	√	✗	✗
150	*Ficus* sp.(1)	Not known	√	✗	✗
151	*Ficus* sp.(2)	Nyaung	√	✗	√
152	*Ficus* sp.(3)	Tha-phan	√	✗	✗
153	*Firmiana colorata* (Roxb.) R.Br.	Not known	√	✗	√
154	*Flacourtia cataphracta Roxb.*	Let-put-thi	√	✗	√
155	*Flacourtia indica*	Let put thi	√	✗	✗
156	*Flacourtia jangomas* (Lour.) Raeusch.	Kyet-yo	√	✗	✗
157	*Flueggea virosa* (Roxb. Ex Willd.)Voigt	Ye-chin-ya	√	✗	✗
158	*Garcinia cowa* Roxb.	Taung-thale	√	√	✗
159	*Garcinia heterandra* Wall.	Taw-min-gut	√	✗	√
160	*Garcinia merguensis* Wight	Ginsin	√	✗	✗
161	*Garcinia pedunculata* Roxb.	Kywe-thone-baung/Met-lin	√	✗	√
162	*Garcinia* sp.	Not known	√	✗	✗
163	*Garcinia speciosa* Kurz	Ba-wa	√	√	√
164	*Gardenia erythroclada* Kurx	Khar yar pin	√	√	✗
165	*Gardenia sessiliflora* Wall.	Ma-gyi-bauk	√	✗	✗
166	*Gardenia sootepensis* Hutch.	Yin-gat	√	✗	√
167	*Gelonium multiflorum* A.Juss	Ka-thi-ta	√	√	✗
168	*Glochidion rubrum*	Hta-minsok	√	✗	√
169	*Gluta tavoyana* Wall.	Thayetche (Taung Thayet)	√	√	√
170	*Gluta usitata*	Not known	√	√	✗
171	*Glycosmis pentaphylla* (Retz.) A.DC.	Taw-sauk-pin	√	✗	✗
172	*Gmelina arborea* Roxb.	Ye-ma-ne	√	√	✗

173	*Gnetum gnemon* L.	Lin-kaw	√	√	א
174	*Gonocaryum griffithianum* (Miers) Kurz	Wun-the-gye	√	א	√
175	*Grewia lacei* J.R. Drumin.ex Craib.	Not known	√	√	א
176	*Grewia laevigata* Vahl	Ta-yaw	√	א	√
177	*Haldina cordiflolia*	Not known	√	א	א
178	*Harpullia cupanioides* Roxb.	Bawa	√	א	א
179	*Helicia reticulata* W.T.Wang	Not known	√	א	√
180	*Heritiera javanica* (Blume) Kosterm.	Kanzo	√	√	√
181	*Heteropanax fragrans* (Roxb. ex. DC.) Seem.	Kyaung-shar-bo	√	א	√
182	*Heterophragma adenophylla* (Wall.) Seem. ex Benth. & Hook.	Phet-than	√	√	√
183	*Hibiscus macrophyllus*	Yar-mar	√	√	א
184	*Holarrhena pubescens* Wall.	Let-htoke-gyi	√	√	א
185	*Homalium grandiflorum* Benth.	Thit-wa	√	א	√
186	*Homalium tomentosum* Benth.	Myauk-chaw	√	√	א
187	*Homonoia riparia* Lour	Gyin-yee	√	א	א
188	*Hopea helferi* (Dyer) Brandis	Kyauk-thingan	√	√	א
189	*Hopea odorata* Roxb.	Thin-gan	√	√	א
190	*Hopea sangal* Korth.	Thin-gan-ma-ka-lay	√	√	א
191	*Hydnocarpus* sp.	Khetlan	√	א	√
192	*Illicium verum*	Lay-nyin	√	א	א
193	*Irvingia malayana* Oliver	Tha-gya-phyu	√	א	√
194	*Ixora* sp.(1)	Not known	√	א	א
195	*Ixora* sp.(2)	Masonetaywet sonetaywet	√	א	√
196	*Knema erratica*	Kywe-thwe	√	א	א
197	*Knema furfurce*	Not known	√	א	א
198	*Lagerstroemia floribunda* Jack	Pyin-ma-phyu	√	√	√
199	*Lagerstroemia macrocarpa* Kurz	Pyin-ma-ywet-gyi	√	א	√
200	*Lagerstroemia speciosa* (L.) Pers.	Pyin-ma-ywet-thay	√	א	√
201	*Lagerstroemia tomentosa* Presl.	Le-za	√	√	√
202	*Lannea coromandelica* (Houtt.) Merr.	Lan-fe	√	א	√
203	*Laportea crenulata* Gaud.	Pet-ya	√	א	א
204	*Leea indica* Merr.	Naga-mauk	√	א	א
205	*Leea macrophylla* Roxb.	Kyar-phet-gyi	√	א	א
206	*Licuala peltata* Roxb.	Sa-lu	√	א	א
207	*Lindera caudata* (Nees) Hook.f.	Not known	√	א	א
208	*Lithocarpus elegans* (Blume) Hatusima ex Saepadma	Bi-gyan	√	א	א
209	*Lithocarpus fenstratus* (Roxb.)Rehd.	Baik-gyan-ywet-gyi	√	א	א
210	*Lithocarpus garretianus*	Not known	√	א	א
211	*Lithocarpus lappaceus* (Roxb.) Rehd.	Thit-cha	√	א	√
212	*Lithocarpus sootepensis*	Not known	√	א	א
213	*Lithocarpus* sp.(1)	Not known	√	א	√
214	*Lithocarpus* sp.(2)	Not known	√	א	א

215	*Lithocarpus* sp.(3)	Not known	√	א	א
216	*Litsea glutinosa* (Lour.) C.B. Robins.	Ta-gu	√	√	√
217	*Litsea grandis* (Nees) Hook.f	Ta-gu-yo-ni	√	א	√
218	*Litsea laurifolia* (Jacq.) Kurz	On-don	√	א	א
219	*Litsea monopetala* (Roxb.) Pers	Ta-gu-ywet-thay	√	א	√
220	*Litsea salicifolia* (Nees) Hook.f	Hta-min-char	√	א	א
221	*Litsea* sp. (1)	Not known	√	א	א
222	*Livistona speciosa* Kurz	Taung-htan	√	א	√
223	*Lophopetalum fimbriatum* Wight	Yan-mye-ni	√	√	א
224	*Macaranga denticulate* Muell. Arg.	Phet-wun	√	א	א
225	*Macaranga gigantea*	Not known	√	א	א
226	*Macaranga siamensis*	Not known	√	א	א
227	*Maesa indica* Wall.	Nwar-pin	√	א	א
228	*Maesa paniculata* A.DC.	Nwar-pin	√	א	√
229	*Maesa ramentacea* A.DC.	Nwa-pin	√	א	√
230	*Magnolia liliifera* (L.) Bail.	Bauk-san-ga	√	א	√
231	*Mallotus barbatus*	Not known	√	א	א
232	*Mallotus paniculatus* Muell.Arg.	Phet-wun-lae	√	א	√
233	*Mangifera caloneura* Kurz	Taw tha yet	√	א	√
234	*Mangifera sylvatica* Roxb.	Tawthayet	√	√	א
235	*Melanorrhoea glabra* Wall.	Thitsi	√	√	√
236	*Memecylon grande* Retz.	Taung-phyue	√	א	√
237	*Mesua nervosa* L.	Taung-gangaw-yaing	√	א	√
238	*Mesua* sp.	Not known	√	א	א
239	*Michelia champaca* L.	San-ga	√	√	√
240	*Michelia* sp.	San-ga-hmwe	√	א	א
241	*Microcos paniculata* L.	Phaw-pha-thi	√	√	א
242	*Micromelum minutum* (G.Forst.) Wight & Am.	Not known	√	√	א
243	*Millingtonia hortensis* L.f.	Egayit	√	א	א
244	*Mishocarpus pentapetalus* (Roxb.) Radik.	Not known	√	א	א
245	*Mitragyna parvifolia* (Roxb.) Korth.	Bin-ga	√	א	√
246	*Morinda angustifolia* Roxb.	Bu-pin or Yeyo	√	א	א
247	*Morinda tinctoria* Roxb.	Ni-ba-sae	√	א	א
248	*Morus laevigata* Wall.	Poe-sa-pin	√	א	√
249	*Myristica angustifolia* Roxb.	Kywe-thwe-ni	√	√	√
250	*Myristica conferta* King	Kywe-thwee khaung-long	√	א	√
251	*Myristica malabarica* Lan.	Kywe-thwee-ywet-thay	√	א	√
252	*Myristica* sp.	Mauk-kha-yar	√	א	א
253	*Nauclea orientalis* L.	U-kha	√	א	√
254	*Nauclea sessilifolia* Roxb.	Thit-pa-yaung	√	א	√
255	*Nephelium lappaceum* L.	Kyet-mauk-wa	√	א	√
256	*Nephelium* sp.	Kyet-mauk-ni	√	א	√
257	*Nephelium* sp.	Kyet-mauk-ni	√	א	א

258	*Nothaphoebe umbelliflora*	Not known	√	א	א
259	*Ochna integerrima*	Ye-nyaung	√	√	א
260	*Olax scandens* Roxb.	Not known	√	א	א
261	*Ormosia watsonii* Fisch	Lezin	√	א	א
262	*Orophea* sp.	Not known	√	א	א
263	*Oroxylum indicum* (L) Kurz	Kyaung-sha	√	א	√
264	*Pajanelia longifolia* (Will.) K.Schum.	Kyaung-dauk	√	א	√
265	*Palaquium obovatum* (Griff.) Engl.	Panle-byin-ywet-gyi	√	א	א
266	*Palaquium sukoei* Fischer.	Panle-byin-ywet-thay (ni)	√	א	א
267	*Pandanus foetidus* Roxb.	Not known	√	א	א
268	*Pandanus odoratissimus* L.f.	Gyit-pin	√	א	√
269	*Parashorea* sp.(1)	Ka-dut-phyu	√	א	√
270	*Parashorea stellata* Kurz.	Ka-dut-net	√	א	√
271	*Parkia leiophylla* Kurz	Shan-da-nyin	√	א	√
272	*Pavetta indica* L.	Myet-na-pan	√	א	√
273	*Payena oleifera* Watt.	Kan-zwe	√	א	א
274	*Payena paralleloneura* Kurz	Zin-zwe	√	א	√
275	*Pentace burmanica* Kurz	Thit-kha	√	א	√
276	*Pentace griffithii* King	Thit-sho	√	א	√
277	*Persea gamblei*	Not known	√	א	א
278	*Persea macrantha* (Nees) Kostermans	Not known	√	א	א
279	*Phoebe cathia*	Not known	√	א	√
280	*Phoebe lanceolata* (Nees) Nees	Kyaung-yi	√	א	√
281	*Phoebe paniculata* (Nees) Nees	Taung-ka-nyin	√	א	א
282	*Phoebe sp.*	Kyeze-ywet-sok	√	א	א
283	*Phoebe tavoyana* (Meissner) Hook.F.	Kye-ze	√	א	א
284	*Phyllanthus albizzioides* (Kurz) Hook.f.	Shit-kha	√	א	א
285	*Podocarpus neriifolius* D.Don	Ye-thit-min	√	√	√
286	*Podocarpus wallichianus* Presl	Thit-min	√	√	√
287	*Polyalthia hookeriana* King	Bok	√	א	√
288	*Polyalthia simiarum* Benth. & Hook. f . ex Hook.f.	Bok-ywet-thay	√	א	√
289	*Polyalthia* sp.	Taw-saga-sein	√	א	א
290	*Polyalthia viridis*	Not known	√	א	א
291	*Pongamia pinnata* Pierre	Thin-win-phyu	√	א	א
292	*Prema bengalensis* C.B. Clarke	Kyun-lan	√	א	א
293	*Prema integrifolia* L.	Taung-tangyi	√	א	√
294	*Psidium acidum* Mart	Ma-la-kar-chin	√	א	א
295	*Pterocarpus macrocarpus* Kurz	Pa-dauk	√	√	√
296	*Pterocymbium macranthum* Kosterm.	Taw-po-sa	√	א	√
297	*Pterocymbium* sp.	Moe pin	√	א	√
298	*Pterospermum acerifolium* Willd.	Not known	√	א	א
299	*Pterospermum semisagittatum* Buch-Ham	Nwa-labyin	√	א	√
300	*Pterostermum grandiflorum*	Not known	√	א	√
301	*Putranjiva roxburghii* Wall.	Dauk-yat	√	א	√

302	*Quercus semiserrata* Roxb.	Not known	√	√	א
303	*Quercus spicata* Smith.	Not known	√	√	א
304	*Rothmannia sootepensis*	Not known	√	א	א
305	*Salacca wallichiana* Mart.	Yin-ngan	√	א	א
306	*Salix tetrasperma* Roxb.	Moe-ma-kha	√	א	א
307	*Sandoricum koetjape* (Burm.f.) Merr.	Thit-to	√	א	√
308	*Sapium baccatum* Roxb.	Taung-yaw	√	א	√
309	*Sapium indicum*Willd.	Bon lon	√	א	א
310	*Sapium insigne* (Muell.Arg.)Trimen	Sut-chat	√	א	א
311	*Saurauia napaulensis*	Not known	√	א	א
312	*Saurauia* sp.	Not known	√	א	א
313	*Schima wallichii* (DC.) Korth.	Thit-ya	√	√	√
314	*Senna timoriensis* (DC.) Irwin & Bameby	Taw-me-za-li	√	א	א
315	*Shorea assamica* Dyer	Me-chaung-kyee	√	א	א
316	*Shorea cinerea* Fischer	Ka-dut	√	√	א
317	*Shorea farinosa* Fisher	U-ban	√	√	√
318	*Shorea gratissima* Dyer	Ban-ka-ya	√	א	√
319	*Shorea henryana* Pierre	Ban-than-gyin	√	√	א
320	*Shorea* sp.	Hput-ma-tet	√	א	א
321	*Spondias pinnata* (L.) Kurz.	Bwe-baung	√	√	√
322	*Sterculia balanghas* L.	Not known	√	א	א
323	*Sterculia foetida* L.	Let-khok	√	√	√
324	*Sterculia lanceolata*	Not known	√	א	א
325	*Sterculia pexa*	Not known	√	א	א
326	*Sterculia versicolor* Wall.	Shaw-phyu	√	א	א
327	*Sterculia villosa* Roxb.	Shaw-ni	√	א	√
328	*Stereospermum colais* (Buch.-Ham. Ex Dillwyn) Mabb.	Than-thit	√	√	√
329	*Stereospermum fimbriatum*	Than-de	√	א	א
330	*Streblus asper* Lour.	On-hne	√	√	א
331	*Streblus taxoides* (K.Henye) Kurz	Ye-onhne	√	א	א
332	*Suregada multiflora*	Not known	√	א	א
333	*Swintonia floribunda* Griff.	Shit-lae	√	√	√
334	*Symplocos racemosa* Roxb.	Not known	√	א	א
335	*Symplocos* sp.	Not known	√	א	√
336	*Symplocos sumuntia* Buch.-Ham.	Taw-thit-khauk	√	א	א
337	*Syzygium albiflorum* (Duthie & Kurz) Bahadur&R.C.Gaur.	Not known	√	א	א
338	*Syzygium buxifolium* Hook. & Arn.	Tha-bye-htat-ta-ya	√	א	√
339	*Syzygium cerasoides* (Roxb.) Raiz.	Tha-bye-gyin	√	א	א
340	*Syzygium claviflorum* (Roxb.) A.M.Cowan &Cowan	Tha-bye	√	√	√
341	*Syzygium grande* (Wight) Walp	Tha-bye-ywet-gyi	√	√	√
342	*Syzygium gratum*(Wight) S.N.Mitra	Tha-bye-pauk-pauk	√	א	א
343	*Syzygium polyanthum* (Wight) Merr.&L.M.Perry	Taung-malaka	√	א	√
344	*Syzygium* sp.(1)	Tha-bye-phyu	√	א	√

345	*Syzygium* sp.(2)	Tha-bye-khun-pya	√	א	√
346	*Syzygium* sp.(3)	Kyauk-tha-bye	√	א	א
347	*Taliparitimacrophyllum* (Roxb. ex Hornem.) Fryxell	Phet-wun-gyi	√	א	√
348	*Tamarindus indica* L.	Magyi	√	א	א
349	*Tarennoidea wallichii* (Hook.f.) D. Tivengadum & Sastre	Khet-mya	√	א	א
350	*Tectona grandis* L.f.	Kyun	√	√	א
351	*Terminalia alata* (Heyne) Roth	Not known	√	א	א
352	*Terminalia bellerica* Roxb.	Thit-seint	√	א	א
353	*Terminalia catappa* L.	Banda	√	א	א
354	*Terminalia chebula* Retz.	Phan-kha	√	א	√
355	*Terminalia* sp.(1)	Not known	√	א	א
356	*Tetrameles nudiflora* R.Br.	Than-phu	√	א	√
357	*Theobroma* sp.(1)	Thit-me	√	א	א
358	*Toona ciliata* M.Roemer	Thit-ka-doe	√	√	א
359	*Trachycarpus oreophilus*	Taw-htan	√	א	א
360	*Trema orientalis* L.	Kywe-sha	√	א	א
361	*Trevesia palmata* (Roxb. Ex Lind.) Vis	Hpaw	√	א	א
362	*Tristania merguensis* Griff.	Mya-ga-mon	√	א	א
363	*Tristaniopsis burmanica* (Griff.)P.G.Wilsan & J.T.Waterh.	Taung-tha-bye	√	א	√
364	*Tristaniopsis* sp.	Taung-pyin-po	√	א	√
365	*Ulmus lancifolia* Roxb.	Sar-phyu	√	א	√
366	*Vangueria pubescens*	Kyet-tet-su	√	א	א
367	*Vatica dyeri* King	Kanyin-kyaung-chae	√	א	√
368	*Vernonia* sp.	Not known	√	א	א
369	*Vitex coriacea* C.B.Clarke	Kyet-yo	√	√	√
370	*Vitex peduncularis* Wall.	Pazin-nyo	√	א	√
371	*Wendlandia glabrata* DC.	Taung-byin	√	א	א
372	*Wrightia arborea* (Dennst.) Mabb.	Seik-noe	√	א	א
373	*Xanthophyllum lanceatum* (Miq.)J.J.Sm.	Thit-phyu	√	א	א
374	*Xanthophyllum virens* Roxb.	Choyin	√	א	א
375	*Xerospermum noronhianum* (Blume)Blume	Kyet-mauk	√	א	√
376	*Xylia xylocarpa* (Roxb.) Taub.	Pyin-ka-doe	√	√	א
377	*Zanthoxylum rhetsa* (Roxb.) DC.	Ka-thit-phyu	√	א	א
378	*Ziziphus mauritiana*	Myauk-zi	√	א	א
379	*Ziziphus rugosa* Lam	Taw-zi	√	א	א

Appendix III .Top 10 Species in terms of population recorded by Smith in 1926 (in order)

No.	Scientific Name	Vernacular Name
1.	*Swintonia floribunda* Griff.	Shit-lae
2.	*Anisoptera curtisii* Dyer	Ka-ban
3.	*Pentace burmanica* Kurz	Thit-kha
4.	*Hopea odorata* Roxb.	Thin-gan
5.	*Syzygium claviflorum* (Roxb.) A.M.Crown & Cowar	Tha-bye
6.	*Lagerstroemia floribunda* Jack	Pyin-ma
7.	*Dipterocarpus* sp.	Ka-nyin
8.	*Dillenia indica* L.	Tha-byu
9.	*Michelia champaca* L.	San-ga
10.	*Dysoxylum grande* Hiern	Ta-gat-ni

Top 10 Species in term of population recorded by present study (in order)

No.	Scientific Name	Vernacular Name
1.	*Swintonia floribunda* Griff.	Shit-lae
2.	*Theobroma* sp.	Thit-me
3.	*Chukrasia tabularis* A.Juss.	Taw-yin-ma
4.	*Amoora rohituka* Wight & Arn.	Gat-pok
5.	*Orophea* sp.	Not known
6.	*Dillenia parviflora* Griff	Zin-byun
7.	*Aporosa* sp.	Thit-khauk
8.	*Shorea henryana* Pierre	Ban-than-gyin
9.	*Diospyros crumentata* Thwaites	Taung-bok
10.	*Knema erratica* *Dipterocarpus* sp. *Castanopsis* sp. *Syzygium claviflorum* (Roxb.) A.M.Cowan &Cowan	Kywe-thwe Ka-nyin Bigyan Tha-bye

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Melastoma malarbarica

Gnetum gnemon L.

Hopea helferi (Dyer) Brandis

Lithocarpus aggregatus



Ficus callosa


Helicia reticulata W.T.Wang


Arenga saccharifera Labill.



Dipterocarpus grandiflorus

Flacourtia cataphracta Roxb.


Dracontomelon dao (Blume) Merr. & Rolfe


Magnolia lilifera


Cinnamomum nitidum Blume

Albizia chinensis (Osbeck) Merr.


Aesculus hippocastanum


Aglaia andamanica Hiern

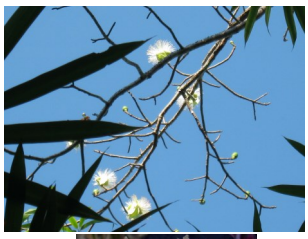
Podocarpus wallichianus Presl


Artocarpus lakoocha Roxb.


Buddleja asiatica Lour.


Diospyros dictyoneura Hiern.


Michelia sp.

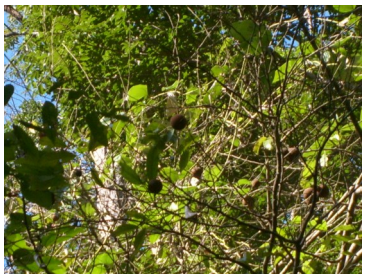




Bombax anceps


Elaeocarpus petiolatus (Jack) Wall.


Mangifera sylvatica Roxb.


Syzygium sp.(2)




Theobroma sp.(1)



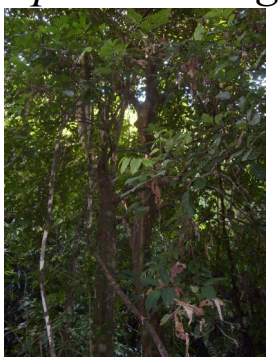
Gmelina arborea Roxb.


Aglaia lawii

Desmos chinensis Lour

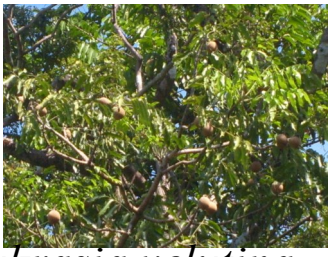

Anisoptera oblonga Dyer


Anisoptera sp.



Dysoxylum cochinchinenese


Ficus annulata



Chukrasia velutina


Dysoxylum procerum Hiern


Antiaris toxicaria (Pers.) Lesch.

Parashorea stellata Kurz.

Payena oleifera Watt.

Knema erratica

Ficus lacor

Syzygium sp.(1)

Ficus benjamina

Myristica malabarica



Grewia lacei J. R.Drumin. ex Craib.



Chukrasia tabularis A.Juss.



Orophea sp.



Homalium tomentosum Benth.

Xylia xylocarpa (Roxb.)

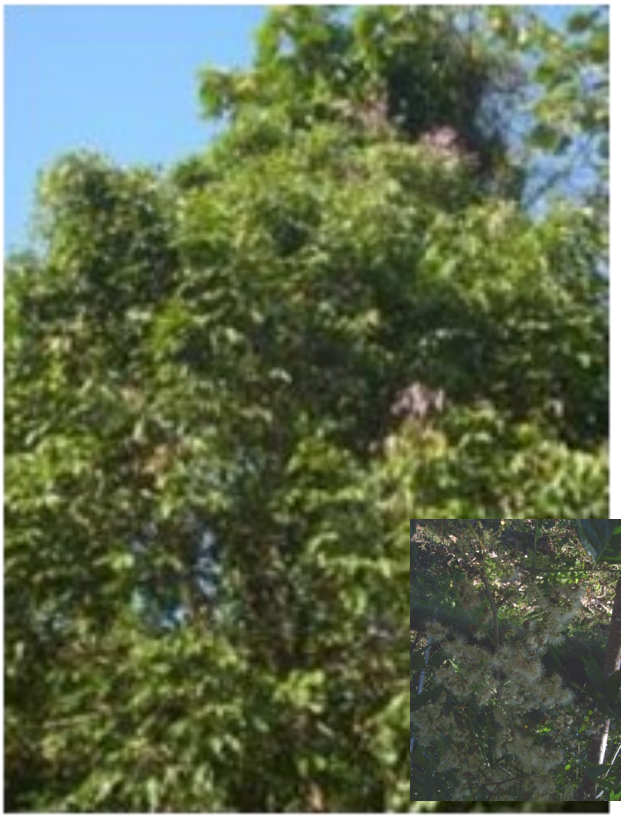



Amoora rohituka Wight & Arn.




Myristica conferta King


Sterculia foetida L.



Archidendron jiringa Jack.

Amoora wallichii King

Gluta usitata

Livistona speciosa Kurz

Mallotus oblongifolius

Myristica angustifolia Roxb.

Aglaia sp.(1)

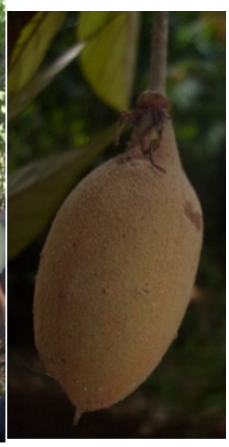
Phoebe tavoyana (Meissner) Hook.F.

Callerya atropurpurea (Wall.) Schot.

Lithocarpus sp.(1)

Duabanga grandiflora Walp

Pavetta indica L.

Pterospermum semisagittatum Buch-Ham


Heterophragma adenophylla (Wall.) Seem.


Swintonia floribunda Griff.


Litsea glutinosa (Lour.)C.B. Robins.

Payena paralleloneura Kurz

Dipterocarpus alatus

Dipterocarpus turbinatus

Dipterocarpus costatus

Dipterocarpus obtusifolius

Barringtonia cymosa Fischer

Gelonium multiflorum A. Juss

Homalium tomentosum Benth.

Pterocarpus macrocarpus Kurz

Microcos paniculata L.

Lagerstroemia speciosa (L.)Pers.

Alstonia scholaris (L.)R.Br

Emblica officinalis Gaertn.

Mitragyna parvifolia (Roxb.)

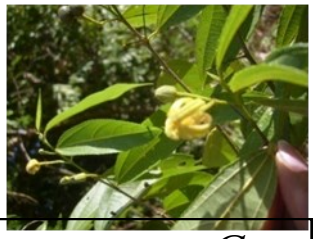
Caryota mitis Lour.

Vitex peduncularis Wall.

Stereospermum colais

Mesua nervosa L.

Shorea cinerea Fischer

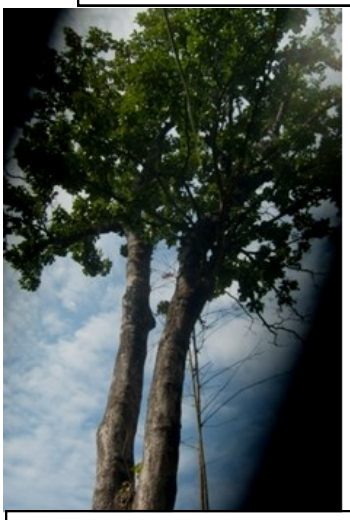
Gre


Leguminosae

Maesa ramentacea

Gardenia erythroclada Kurx

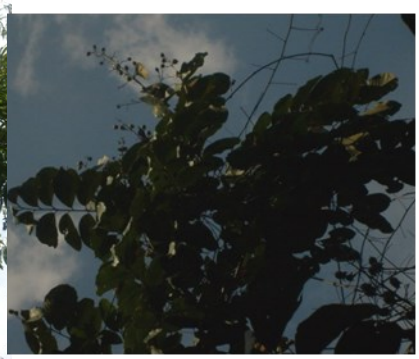
Senna timoriensis




Careya arborea Roxb.


Wrightia arborea (Dennst.) Mabb.


Litsea sp.

Lagerstroemia macrocarpa Kurz

Sterculia balanghas


Glycosmis pentaphylla (Retz.)A.DC.

Pentace burmanica Kurz



Cnestis ramiflora Griff.

Gonocaryum griffithianum (Miers)Kurz

Carallia brachiata (Lour.)

Garcinia sp.

Garcinia heterandra Wall.

Pentace griffithii King

Nephelium lappaceum L.

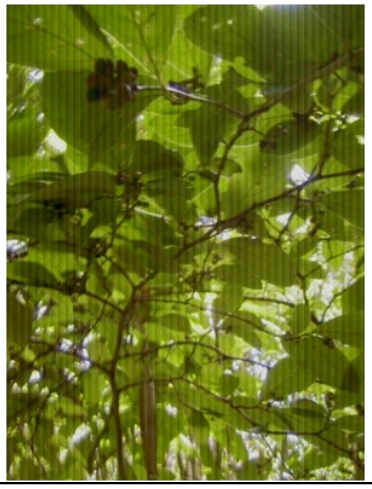


Litsea grandis (Nees) Hook.f

Litsea monopetala (Roxb.)Pers

Dialium indum L.

Cinnamomum sp. (1)



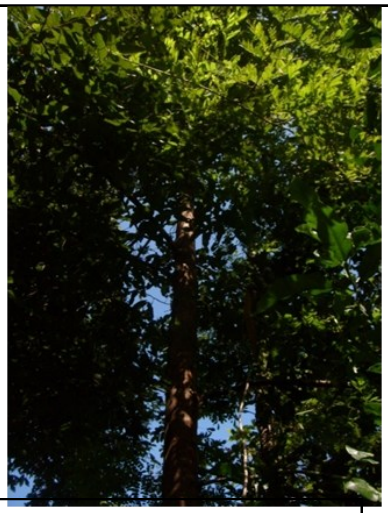
Antidesma ghesaembilla Gaertn.

Litsea laurifolia (Jacq.)Kurz

Streblus asper



Pterospermum acerifolium

Hopea odorata

Prema bengalensis C.B.Clarke

Michelia champaca L.


Persea gamblei



Lithocarpus sootepensis



Albizia odoratissima (L.f.) Benth.




Xerospermum noronhianum (Blume)Blume



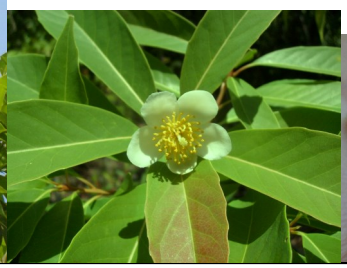
Syzygium cerasoides (Roxb.) Raiz.


Castanopsis argyrophylla King

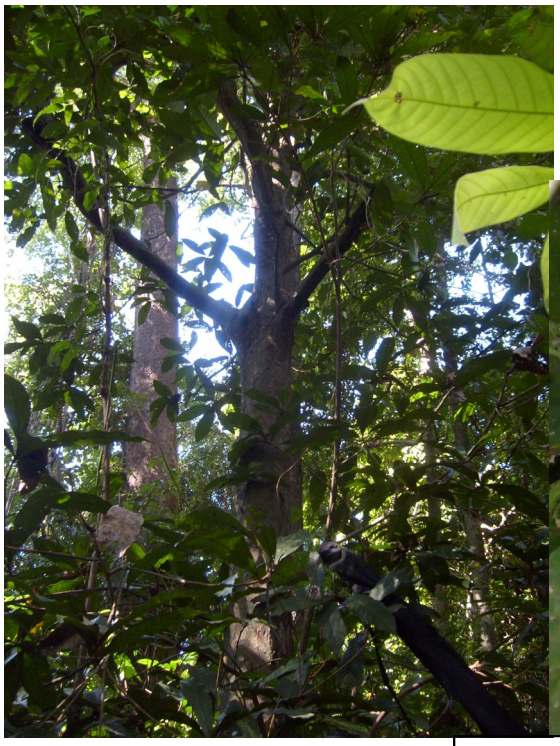


Nauclea sessilifolia Roxb.






Schima wallichii (DC.)Korth.



Ixora sp. 1

Nephelium sp.

Pandanus odoratissimus L.f.

Harpullia cupanioides Roxb.

Lophopetalum fimbriatum Wight

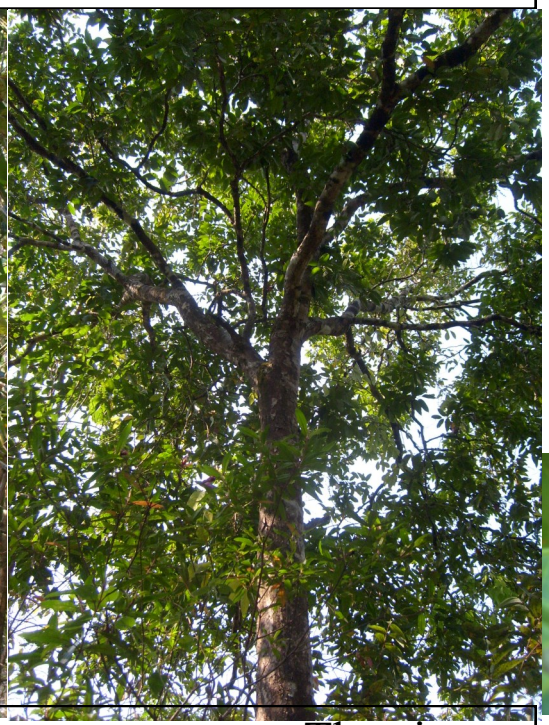
Anisoptera oblonga Dyer

Xanthophyllum virens Roxb.

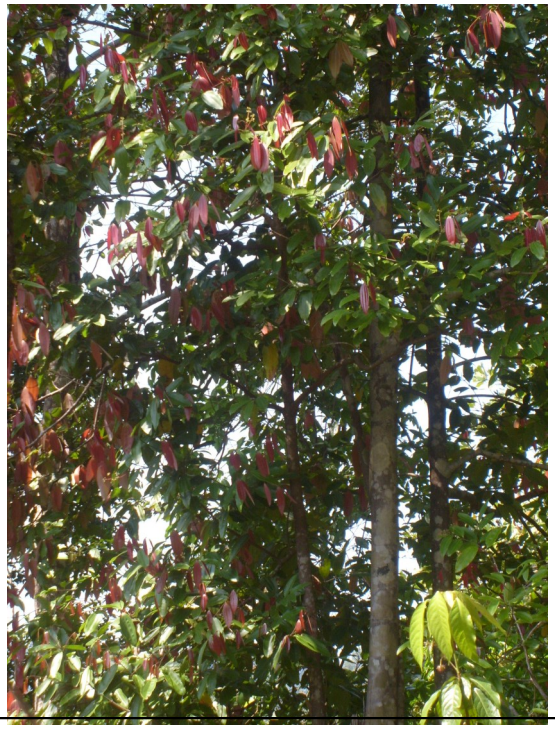
Dalbergia rimosa Roxb.

Glochidion rubrum

Chisocheton paniculatus Hiern.

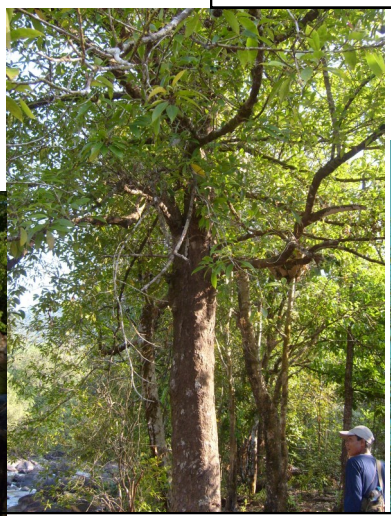


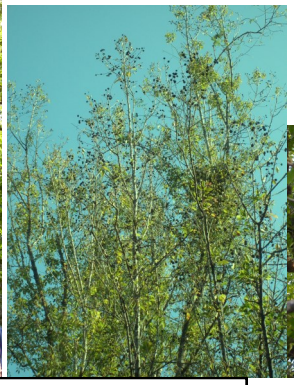
Chaetocarpus castanocarpus Thwaites



Cinnamomum pachyphyllum Kosterm.

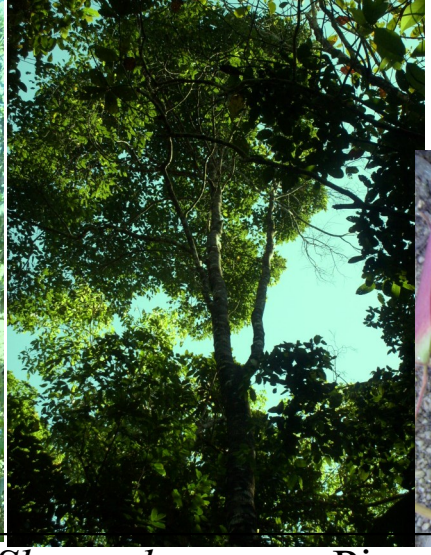
Dalbergia sisoo Roxb.





Altingia excelsa Noronha

Garcinia merguensis Wight

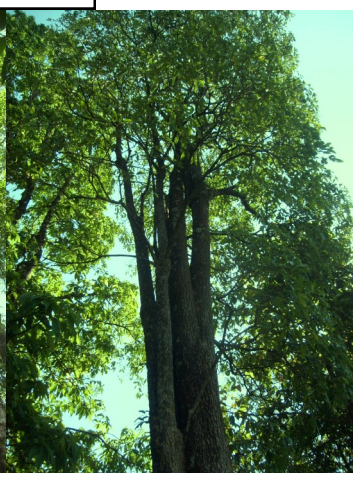




Shorea henryana Pierre



Calophyllum kunstleri King





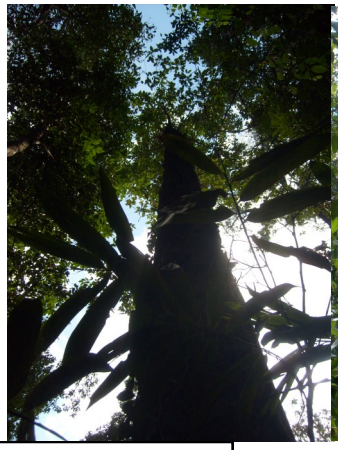
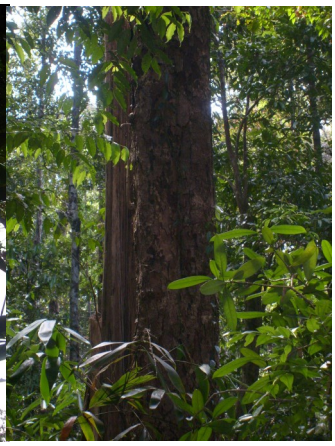
Actinodaphne sp.(2)


Illicium verum

Holarrhena pubescens Wall.

Cratoxylum neriifolium Kurz.

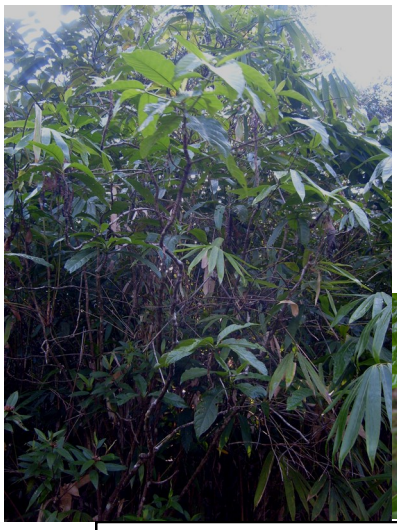
Cratoxylum polyanthum Korth.

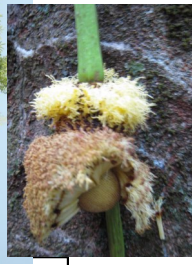
Shorea assamica Dyer



Tristania merguensis Griff.







Morinda tinctoria Roxb.

Parkia leiophylla Kurz



Streblus taxoides (K.Henye)Kurz

Palaquium obovatum (Griff.) Engl.

Mallotus oblongifolius

Shorea sp.


Sterculia lanceolata

Mallotus barbatus

Avicennia officinalis L.

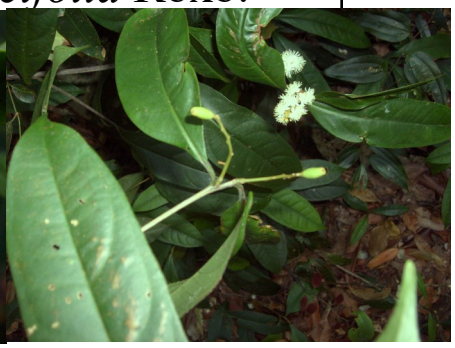


Ochna integerrima


Licuala peltata Roxb.

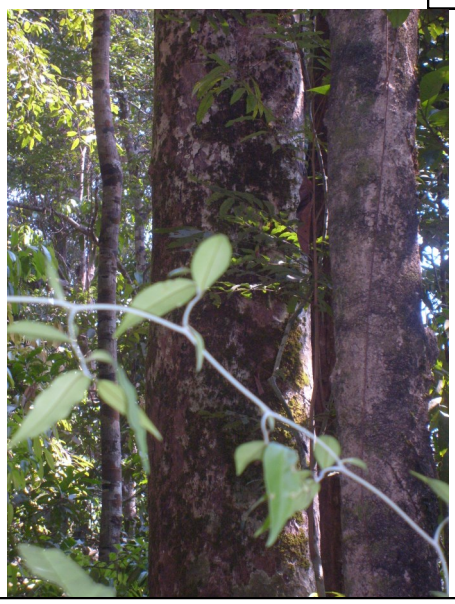

Ulmus lancifolia Roxb.





Symplocos sp.


Albizia procera (Roxb.) Benth.



Melanorrhoea glabra Wall.


Pauhinia purpurea L.


Areca triandra Roxb.

Ziziphus rugosa Lam


Syzygium claviflorum





Syzygium buxifolium Hook. & Arn.


Eugenia sp.(1)



Achras zapota L.

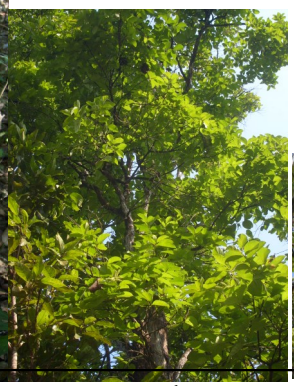
Gluta tavoyana Wall.


Sapium indicum Willd.



Pongamia pinnata Pierre

Shorea farinosa Fisher

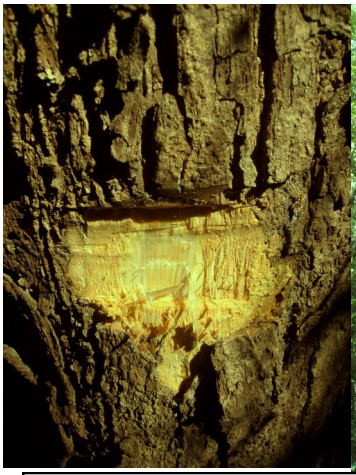


Crypteronia pubescens Blume

Podocarpus neriifolius D.Don

Cinnamomum sp. (1)


Ficus microcarpa




Anisoptera curtisii Dyer


Lannea coromandelica (Houtt.)Merr.


Croton roxburghianus N.P.Balakr

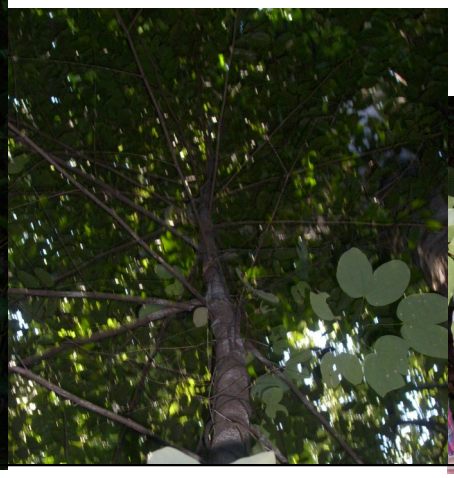
Ardisia colorata Roxb.

Ficus sp. (1)

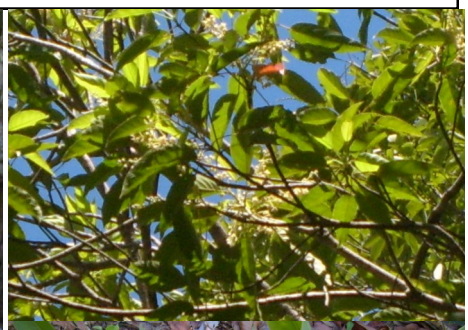
Hydnocarpus sp.

Desmos chinensis Lour

Sapium insigne (Muell.Arg.)Trimen


Memecylon grande Retz.

Elaeocarpus petiolatus (Jack) Wall.



Mesua sp.


Litsea salicifolia (Nees) Hook.f

Micromelum minutum




Dipterocarpus tuberculatus Roxb.




Anneslea fragrans Wall.




Terminalia chebula

Psidium acidum Mart

Engelhardtia spicata Blume

Tarennoidea wallichii (Hook.f.) D. Tivengadum & Sastre

Mangifera caloneura Kurz



Bambusa sp.



Neohouzeaua dullooa



Maclurochloa sp.

Desmos cochinchinensis Lour.

Baccaurea sapida Muell.Arg.

Bombax ceiba L.

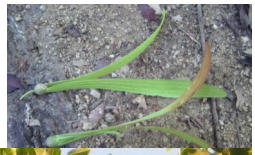
Bridelia sp.

Homonoia riparia Lour

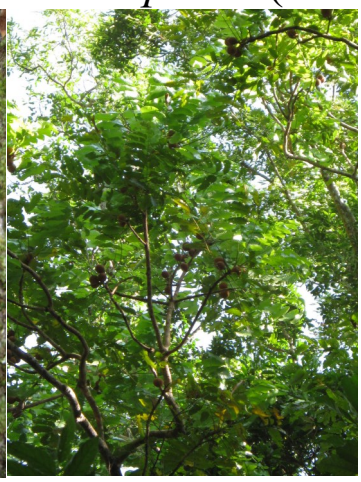
Albizia lebbek (L.)Benth.

Ziziphus mauritiana

Irvingia malayana Oliver



Anisoptera scaphula (Roxb.) Pierre

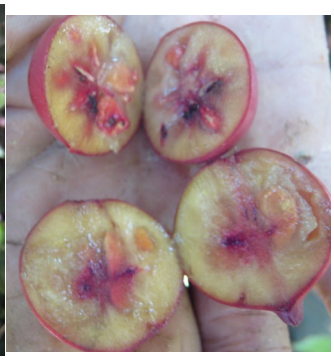


Myristica angustifolia Roxb.

Myristica conferta King

Inocarpus sp. (2)

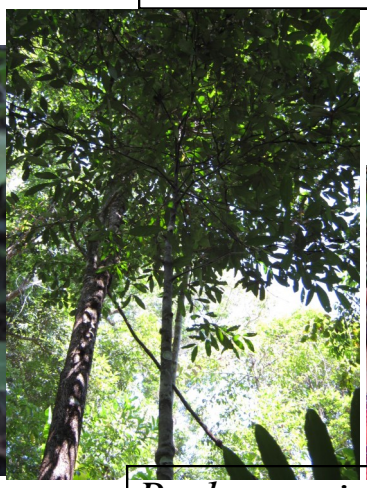


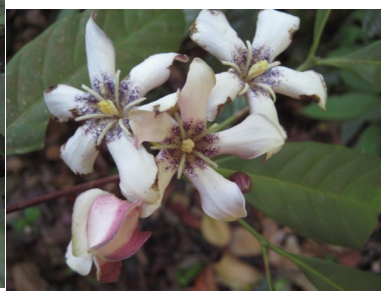



Flacourtia indica



Polyalthia simiarum



Rothmannia sootepensis



Diospyros undulate




Phoebe lanceolata (Nees) Nees





Dillenia scabrellia Roxb.


Taung-panthi




Sterculia villosa Roxb.

Markhamia stipulata

Derris sp.

Artocarpus chaplasha Roxb.

Vernonia sp.

Barringtonia

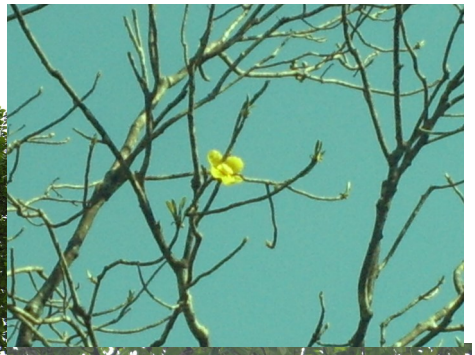
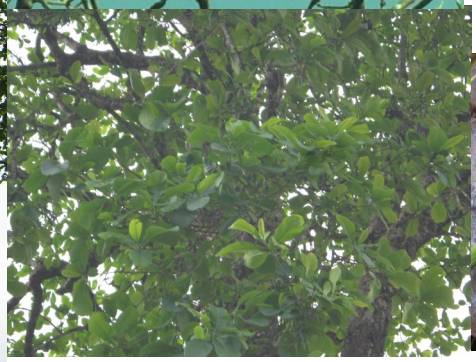


Sapium baccatum Roxb.

Syzygium grande (Wight)Walp


Lagerstroemia floribunda Jack


Anthocephalus morindaefolius Korth.


Dillenia parviflora Griff



Bhesa robusta (Roxb.) Ding Hou


Suregada multiflora

Erythrina suberosa Roxb.

Syzygium sp.(3)

Crateva magna (Lour.)DC.


Prema bengalensis C.B. Clarke



Barringtonia acutangula (L.)Gaertn.


Hibiscus macrophyllus

Euonymus javanicus Blume


Quercus semiserrata Roxb.


Vaccinium donianum Wight.

Aporusa dioica (Roxb.) Mull.Arg.



Quercus spicata Smith.

Swintonia schwekii (Teijsm.& Binn)