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FOREST INVENTORY OF SACRED GROVES IN MEGHALAYA
VOLUME – V
YEAR: 2024-2025











FOREST RESOURCES SURVEY DIVISION
WORKING PLAN, RESEARCH & TRAINING AND
DISTRICT COUNCIL AFFAIRS WING
FOREST AND ENVIRONMENT DEPARTMENT
GOVERNMENT OF MEGHALAYA

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Shri Conrad K. Sangma
Hon'ble Chief Minister & Minister in-charge
Forest and Environment Department
Govt. of Meghalaya



FOREWORD

Conservation of nature and natural resources has been an integral part of cultural ethos of tribal communities in Meghalaya. Communities have protected and conserved several tracts of forests for religious and cultural belief. The Meghalaya is a home to several such undisturbed virgin forests commonly known as 'sacred groves'. Local tribal communities believe that their deity who guards them from natural calamities and diseases as well as provide for their well-being resides in these forests.

Sacred groves which have remained undistributed for centuries are repositories of rich biodiversity. They are the last refuge for a significant number of endemic, endangered, rare and relic native taxa. Sacred groves are the last bastion where rich culture and customs of indigenous communities are still preserved. Sacred groves are a living specimen of the strong symbiotic relation between forests and the local tribal communities in Meghalaya.

With the gradual relegation of spiritual, cultural and religious beliefs by materialistic needs, traditional faith and cultural ethos which helped in preservation of sacred groves are gradually eroding. Erosion of the faith and reverence is resulting in degradation and shrinkage of several sacred groves. Absence of a proper regulatory and funding mechanism for conservation, protection and scientific management has hastened the pace of degradation of sacred groves.

It gives me immense pleasure to learn that Working Plan, Research & Training and District Council Affairs Wing in the Forest and Environment Department is undertaking inventory of sacred groves in the State and is bringing out fifth volume of a Report containing details of twenty-four sacred groves. I am sure the Report will make residents of the State aware of importance of sacred groves and will motivate them to join hands with the Forests and Environment Department for conservation and protection of sacred groves.

I congratulate the Principal Chief Conservator of Forests, Working Plan, Research & Training and District Council Affairs Wing in the Forest and Environment Department and his entire team for their initiative and hard work to publish this Report.

(Conrad K Sangma)

Shri Sampath Kumar, IAS
Principal Secretary
Forest and Environment Department
Govt. of Meghalaya



MESSAGE

Sacred Groves are large vegetative areas rich in biodiversity protected by communities living around them for spiritual and cultural purposes. They serve as conservation sites for many valuable crops and medicinal plants which act as a gene pool. They also help in conservation of vulnerable wildlife species. Sacred groves of Meghalaya are live examples of rich tradition of biodiversity preservation in the State. Sacred groves showcase rich conservation practices of local tribal communities which have been part of their traditional ethos and passed on from generations to generations.

While many sacred groves are being preserved by the communities with full religious fervour, some sacred groves reflect neglect, degradation and degeneration. Vanishing of species in many of the sacred groves due to various anthropogenic disturbances like alteration of natural habitat, excessive utilization, pollution and invasion of alien invasive species is so fast that many precious taxa may disappear even before they are identified, properly documented and their scientific, cultural, therapeutic and commercial values are discovered.

I am happy to learn that Working Plan, Research & Training and District Council Affairs Wing in Forest and Environment Department has taken initiative to bring out fifth volume of the publication on sacred groves. I sincerely hope that this publication will be a very significant documentation of the rich cultural and conservation heritage of the State and will be useful for policy makers, forest administrators, researchers and common residents of the State.

I congratulate the Principal Chief Conservator of Forests, Working Plan, Research & Training and District Council Affairs Wing and his entire team for their efforts in compiling valuable information about the sacred groves.

(Sampath Kumar)

Shri R. S. Gill, IFS
Principal Chief Conservator of Forests & Head of Forest Force
Forest and Environment Department
Govt. of Meghalaya



MESSAGE

Sacred Groves are forests which are believed to house spiritual deities as per the Khasi and Jaintia culture. They are also known as "Nature's Museum". The Khasi, Jaintia and Garo are known to be living in sync with nature, because their culture and custom believed the divine connections with nature. Sacred Groves of these hills and slopes are proof of the ancient environment conservation concept nurtured by them. Sacred Groves are store house of rich biodiversity. Rich in traditional belief, knowledge, stories, rituals and faith of the local people are associated with these Sacred Groves. Preservation and conservation of the Sacred Groves in Meghalaya is a good in-situ conservation strategy which in turn will enable preservation of the rare biodiversity of the state.

It gives me immense pleasure to learn that Forest Resources Survey Division, Shillong under the aegis of the Working Plan, Research & Training and District Council Affairs Wing of Forest & Environment Department is continuing the Inventorisation and documentation of Sacred Groves in Meghalaya and is publishing yet another volume titled as **"Forest Inventory of Sacred Groves in Meghalaya"** ***Volume V***.

I place on record my deepest appreciation for the Principal Chief Conservator of Forests, Working Plan, Research & Training and District Council Affairs Wing and his entire team for their efforts, dedication and hard work in bringing out this publication. I hope this publication will certainly help in the preservation and conservation of Sacred Groves in Meghalaya.

(R. S. Gill, IFS)

Shri Harish C. Chaudhary, IFS
Principal Chief Conservator of Forests, Working Plan,
Research & Training and District Council Affairs
Forest and Environment Department
Govt. of Meghalaya



PREFACE

The picturesque landscape of Meghalaya is dotted with patches of undisturbed, virgin forests protected by the local tribal communities for centuries for religious and cultural reasons. These forests, commonly known as sacred groves are rich repositories of biodiversity and cultural heritage. Sacred groves provide a number of ecosystem services such as reduction in soil erosion, maintenance of hydrological cycle, ensuring availability of water free from contamination and natural dispersal of seeds. The sacred groves also help in maintaining health of ecosystem, reduce habitat destruction and conserve viable population of pollinators and predators. The value of these undisturbed, virgin forest patches for biodiversity conservation and carbon sequestration has gained increasing attention with the rising impacts of climate change.

Sacred groves in Khasi and Jaintia hills are known as *Law Lyngdoh, Law Niam, Khloo Blai, Law Kyntang* and *Kosi* depending on the place where they are located. Sacred groves in Khasi and Jaintia Hill regions of the Meghalaya enjoy legal protection under the United Khasi and Jaintia Hills Autonomous District (Management and Control of Forests) Act, 1958. The Act mandates survey, mapping and registration of each sacred grove with the concerned Autonomous District Council. Majority of sacred groves have however, not been surveyed, mapped and registered. Consolidated information about area, floral and faunal diversity, growing stock, associated customs and cultural practices and management of sacred groves in the State is not available.

To facilitate long term conservation, protection and scientific management of sacred groves, Working Plan, Research & Training and District Council Affairs Wing in the Forest and Environment Department through the Forest Resources Survey Division has initiated survey, mapping and inventory of growing stock in sacred groves in the State. Volume-I and Volume-II of a Report on Forest Inventory of Sacred Groves of Meghalaya, each containing details of 20 sacred groves, have been published in the year 2017 and the year 2022 respectively. The Volume-III of a Report on Forest Inventory of Sacred Groves of Meghalaya containing details of 24 sacred groves was published and released this year. The Volume-IV of a Report on Forest Inventory of Sacred Groves of Meghalaya containing details of 24 sacred groves is already under publication. This Volume-V of the publication contains details of twenty-four sacred groves located in different parts of Khasi Hill and Jaintia Hills.

I believe that the publication will serve as a ready reference for researchers and officials of the State Government and Autonomous District Councils and will help acquaint everyone with ecological, economic, religious and cultural importance of sacred groves. It is my fervent wish that this publication will inspire nature lovers and young researchers in the northeast India to take up research to unravel and document various types of ecological services provided by sacred groves and to suggest pragmatic and cost-effective solutions for conservation, protection, restocking and rejuvenation of sacred groves. The publication may also serve as base document for formulation and registration of carbon credit proposals.

(H.C. Chaudhary)

Shri Sanwar Mal Swami, IFS
Divisional Forest Officer
Forest Resources Survey Division
Forest and Environment Department
Govt. of Meghalaya



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I am grateful to Shri Conrad K. Sangma, Hon'ble Chief Minister and Minister in-Charge Forest and Environment Department, Government of Meghalaya for his support and guidance in bringing out this publication.

I appreciate and acknowledge the wholehearted administrative support received from Shri Sampath Kumar, IAS, Principal Secretary to the Government of Meghalaya and Shri R.S. Gill, IFS, Principal Chief Conservator of Forests and Head of Forest Force (HoFF), Meghalaya for publication of this Report.

Publication of this Report would not have been possible without the constant support and guidance by Shri H.C. Chaudhary, IFS, Principal Chief Conservator of Forests, Working Plan, Research & Training and District Council Affairs, Meghalaya. I place on record my heartfelt thanks and gratitude to Shri H.C. Chaudhary for his leadership.

I sincerely express my gratitude to Shri. R. L. Thiek, IFS and Shri. R. Nainamalai, IFS for their support and guidance.

I convey my heartfelt appreciation to Lyngdohs, Headmen and other Management Bodies of these sacred groves for their consent, help and support in mapping of sacred groves and collection of field inventory data.

I am thankful to Smti. Evanylla Iangngap, Forest Range Officer, Shri. W. T. Swett, Shri. B. Makdoh and other staff of Forest Resources Survey Division for their hard work in collection and analysis of field data. I am also thankful to Smti. Bemeness Lyngdoh, Shri. Arkin S. Nongbri and Smti. Senobia Chyne for their dedication in data entry, providing assistance in analysis of field inventory data and typing of this document.

I appreciate the cartographic assistance provided by Shri Jerry F. Kharkongor, Analytical Assistant and Ms. Angie Lyngdoh Tron working as GIS Expert in office of the Principal Chief Conservator of Forests, Working Plan, Research & Training and District Council Affairs.

(Sanwar Mal Swami)

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Chapter –I

SACRED GROVES IN MEGHALAYA: A BRIEF OVERVIEW

1.1 INTRODUCTION

Meghalaya is known for a long-standing conservation practice of the local communities in the form of preserving sacred groves and several other community owned forests. These intact virgin forests, also known as "Nature's Museum" are believed to house spiritual deities of the Khasi and Jaintia culture. Residents of Meghalaya belonging to Khasi, Jaintia and Garo tribes are known to have lived in close harmony with nature, as their culture and custom believe in the celestial connection through nature. According to the estimates by different academicians and researchers, number of sacred groves and forests owned and protected by communities and clans in the Meghalaya is likely to be more than four hundred. These sacred groves and community and clan forests are repository of rich flora and faunal diversity. Traditional knowledge, beliefs, stories, rituals and faith of the people are associated with these sacred groves and forests owned by communities and clans.

In spite of huge ecological and economic importance, only a few scientific studies have been undertaken on sacred groves and forests owned by communities and clans. A very little is known about flora, fauna, growing stock, carbon stock *etc.* in these forests. To bridge this information gap, the Forest Resources Survey Division under the Working Plan, Research & Training and District Council Affairs Wing in the Forests and Environment Department, Meghalaya has initiated detailed forest inventory of sacred groves and forests owned by communities and clans in the State in a phased manner as a continuing work over the several years. Inventory includes boundary mapping, listing of all floral species including herbs, shrubs and bamboo species, assessment of growing stock and diameter class distribution of trees. Inventory has been done using a systematic random sample design for each sacred grove and forest owned by communities and clans separately in random sample plots. Sample plots, each of 0.2 hectare were laid on the ground for measurement of the identified parameters. Methodology of inventory has been described in detail in a later section of this document. In the first four volume published earlier, inventory of 88 sacred groves located in Khasi and Jaintia Hills region of the State have been documented. This volume contains inventory results and other observations for 24 additional sacred groves and forests owned and managed by the communities and clans.

1.2 GENERAL INFORMATION ON SACRED GROVES OF MEGHALAYA

A good example of the traditional practices by various indigenous communities of the world in the conservation and protection of small forests patches is to bestow these forests to local deities. Such forest patches are called "Sacred Groves". Sacred groves are the tracts of virgin forests which are left intact by local inhabitants for religious beliefs and customs. Sacred groves harbour rich biodiversity and are protected by the local communities for their cultural and spiritual beliefs and taboos believing that their deities reside in them.

Sacred Groves and other forests owned and protected by communities and clans are in existence in Meghalaya since ancient times, much before the advent of Christianity. Local tribal

residents believe that *'U Basa'* or goddess dwells in these thick, virgin forests. Local communities believe that pleasing the *'U Basa'* through sacrifice of animals such as pig, goat, cow, buffalo and fowl *etc.* together with performance of dance will protect their village or clan from famine, bad omens and other sufferings. In the past, people did not dare to enter or cause any harm to these forests. It is interesting to know that even today, in some sacred groves, no one is allowed to even pluck twigs of a plant, use a steel, wire, nail or any other metallic object, wear shoes or slippers, take photograph or attend nature's call. In some sacred groves rituals are performed regularly even today.

All forms of vegetation in a sacred grove are believed to be protected by the reigning deity, and any disturbance is a taboo (Vartak and Gadgil 1973 Khan et al. 1987, Khiewtam and Ramakrishnan 1989). Sacred Groves are used as indicators of potential natural vegetation (Schaaf 1998) and are vital for well-being of the society. Sacred groves and sacred trees serve as a home for birds and mammals and hence, they indirectly help in conservation of living organisms (Islam et al. 1998). Even before starting the field works in some selected sacred groves, the Lyngdoh (Priest) has to initially perform rituals to seek permission from the '*U Basa*' to allow field crew to enter and carry out the survey works in peace and harmony.

With the advent of Christianity, coupled with improvement of education system and exposure to western lifestyle, people are gradually drifting away from the traditional beliefs of '*U Basa'.* This trend perhaps led to degradation in some sacred groves. In many sacred groves and other community and clan owned forests, religious rituals are no longer performed. Some of the sacred groves are plagued with encroachments, illegal felling of trees and invasion by unwanted weeds and invasive species which has in turns destroyed these pristine and relic forests of the State.

Provisions of the Sixth Schedule to the Constitution extend to the almost entire Meghalaya, except a small area falling under jurisdiction of the Shillong Municipal Board. The Sixth Schedule provides for constitution of a Districts Council in each of the three Autonomous Districts in Meghalaya namely; Khasi Hills Autonomous District, Jaintia Hills Autonomous District and Garo Hills Autonomous District. As per paragraph 3 of the Sixth Schedule, District Council for an autonomous district in respect of all areas within the district shall have power to make laws with respect to, among others, management of any forest not being a reserved forest.

In exercise of the powers conferred by the paragraphs 3 of the Sixth Schedule, the United Khasi Jaintia Hills Autonomous District Council (Management and Control of Forests) Act, 1958 has been enacted. Provisions of the Act extend to the entire Khasi and Jaintia Hill regions in the State. Section 3 of the Act classifies the forests under control of the Autonomous District Council into eight categories. As per the said classification, forests set apart for religious purpose and hitherto managed or controlled by the Lyngdoh (*Priest*) on other person or person to whom the religious ceremonies for the particular locality or village or villagers are entrusted are known as *Law Lyngdoh* or *Law Kyntang* or *Law Niam.* In Jaintia Hills these forests are also known as *Khloo Blai* by the local communities. Similarly, the village forests hitherto reserved by the villagers themselves for conserving water, etc; for the use of the villagers are known as *Law Adong* or *Law Shnong*. Forests belonging to an individual clan or joint clans which are grown or inherited such clan or clans in a village or common raj land are known as *Law-Ri-Sumar*.

As per the United Khasi Jaintia Hills Autonomous District Council (Management and Control of Forests) Act, 1958, *Law Lyngdoh, Law Kyntang* and *Law Niam*, are managed by the Lyngdoh (*Priest*) or other person or persons to whom the religious ceremonies for the particular locality or village or villages are entrusted in accordance with the customary practice in vogue subject to the rules that may be framed by the Executive Committee of the District Council from, time to time. *Law Adong* and *Law Shnong,* as per the said Act, are managed by the *Sirdar* or Headmen with the help of the Village *Dorbar* in accordance with the customary practice in vogue subject to the rules that may be framed by the Executive Committee of the District Council from time to time. Similarly, *Law-Ri-Sumar*, as per the said Act, are managed by the clan or clans which own these forests, subject to the rules that may be framed by the Executive Committee of the District Council from time to time in the general interest of the forestry of the district.

Sacred groves and forests owned by communities and clans provide a number of ecosystem services such as reduction in erosive force of water, conservation of soil, maintenance of hydrological cycle, availability of water of desired quality, natural dispersal of seeds of useful species and conservation and storage of germplasm. The sacred groves also help in maintaining the desired health of ecosystem, reduce habitat destruction, conserve viable population of pollinators and predators, serve as potential source of propagules that are required for colonization of wastelands and fallows, conserve indigenous flora and fauna and preserve cultural and ethical practices developed through indigenous knowledge of generations (Ramakrishnan and Ram1988, Godbole et al. 1998, Godbole and Sarnaik 2004,Tiwari et al. 1998a,b, Singh et al. 1998).

The National Forest Policy, 1988, which aims to at bring at least 33% of the country's geographical area and at least 66% of the total geographical area in hilly States like Meghalaya under forest/tree cover lays much emphasis on protection and improvement of the existing forests in the wake of various ecological and anthropological threats. Sacred groves and other communities and clan owned forests need to be conserved and protected to achieve the goals stated in the National Forest Policy.

The traditional religious practices of worship of nature as followed in different parts of world greatly contribute to the promotion and achievement of the global, regional and national goals of conservation of biodiversity and keeps the ecological processes balanced, which is necessary for human survival. They also play an important role in conservation of flora and fauna. Several rare and threatened species are found only in sacred groves, which perhaps are the last refuge for those vulnerable species.

In Khasi Hills, *Law Lyngdoh Nonglyngkien* and *Law Lyngdoh Ing-blei Nonglyngkien* situated in South West Khasi Hill district are good examples of such sacred groves. These two sacred groves are owned and controlled by the *Lyngdoh Nonglyngkien* clan. These sacred groves were registered with the *Syiem* (Chief) of Maharam *Syiemship* more than a century ago on 5th April, 1909. Person belonging to Lyngdoh clan are only allowed to enter these sacred groves, that too at the time of performing rituals only. Moreover, designated members of the clan directly involved in performing rituals such as *Nongknia Lyngdoh Rangbah* (head of sacrifice ceremony), *U Lyngdoh Pomblang* (one who sacrifices goat), *U Lyngdoh Dieng Sning* (one who plant *Quercus* species

during rituals), *Ka Nongseng Knia* (one who prepares the sacrifice) and *Ka Nongpomsla* (one who gather leave for the sacrifice) can only enter into the sacred grove, that too only four times in a year.

Four types of rituals, as per the details given below, are performed by the *Lyngdoh Nonglynkien* clan in these sacred groves:

1. ***Krod Lyngdoh***- This ritual is performed every year in the month of March. The ritual involves preparation of an altar, jungle clearance along the boundary of sacred groves and burning of debris. This ritual is performed to seek blessings of the deity before sowing the crops.

2. ***Rah Snieh***- This ritual is performed every year during the month of June. The ritual involves planting a sapling of *Quercus* species (*Dieng sning*) in front of the altar while chanting hymns, singing, dancing and beating of drums. The ritual symbolizes commitment of the community for protection of the flora of the sacred grove. Ritual also involves sacrifice of a goat while praying to deity to bless them and cleanse their sins. Head of the goat sacrificed during the ritual is kept on the sapling planted during the ritual as a symbol of the sacrifice.

3. ***Knia San dei***- This ritual is performed during the month of October. The ritual involves sacrifice of a fowl (hen) by a lady priest and *U Lyngdoh*. Prayers are made during the ritual to seek blessing of the deity for protection of their crops like paddy, maize, *etc.* from the storms, or other calamities until harvest time.

4. ***Shat dur***- This ritual is performed during the month of December or January after harvest. In this ritual a portion of harvest gathered from each household is offered to the deity while singing and dancing to thank the deity for the harvest. The ritual is performed in the altar of *Law Lyngdoh Ingblei*.

Some of sacred groves which are still performing annual rituals are *Law Lyngdoh Lyngiong* and *Khloblai Raij Khonshnong*.

Chapter – II

METHODOLOGY FOR INVENTORY OF GROWING STOCK

2.1 ESTIMATION OF GROWING STOCK (WOOD VOLUME)

The information on growing stock has traditionally been reckoned as a key indicator of forest health and productivity. Periodic assessment of growing stock is essential to frame policies and strategies for sustainable use of forest resources. In addition, the growing stock estimate helps in quantification of biomass and assessment of carbon stored in the forest ecosystems. Estimation of growing stock has, therefore, assumed significance in the existing climate change scenario. In addition, precise and time series information on growing stock has become essential for formulation of proposals and registration thereof on appropriate carbon registry to earn carbon credits.

For estimation of growing stock, 153 sacred groves and community owned forests spread over different locations in Khasi and Jaintia Hills region of the State have been identified. The extent of the groves varies from as low as 0.2 ha to about 200 ha. The terrain varies from flat, gently rolling to steep slope. Most of the groves are home to dense forest of mixed species. These groves are managed by traditional authorities. In some of the groves, plantations have been raised by the Forest and Environment Department.

2.2 METHODOLOGY

2.2.1 Sampling Intensity

For the purpose of estimating growing stock, enumeration has been carried out as per the following sampling intensity: -

(i) 100% enumeration in groves having less than 2 hectare area.

(ii) 10% enumeration in groves having more than 2 hectare area subject to minimum 10 sample plots, each of 0.20 ha area.

2.2.2 Enumeration in groves having less than 2 hectare area

In the sacred groves having less than 2(two) hectare area all trees having more than 30 cm girth (over bark) at breast height (1.37 meter from the ground level) are enumerated. For the ease in enumeration, sacred groves are divided in different parts with the help of a nylon rope, as per the convenience and enumeration is carried out part by part. The trees which are enumerated are marked with some marker or chalk stick to avert the possibilities of multiple counting or skipping of any tree.

2.2.3 Identification of Number and Location of Sample Plots for Enumeration in Sacred Groves having More Than 2 Hectare Area

Following methodology is adopted to identify the number and location of sample plots in a systematic manner (Systematic sampling) for enumeration in sacred groves having more than 2-hectare area:

(i) On the map of the sacred grove, grid lines are drawn along the latitude and longitude at an interval of 2" x 2".

(ii) The cells having less than half of their area in the sacred grove are ignored. Starting from the north-west corner, the remaining cells having at least half of their area in the sacred grove are serially numbered. The numbering is done column wise in north to south direction.

(iii) Based on area of a sacred grove, total area for enumeration (10% for sacred groves having more than 2 ha area subject to minimum 10 sample plots of 0.20 ha area) is estimated.

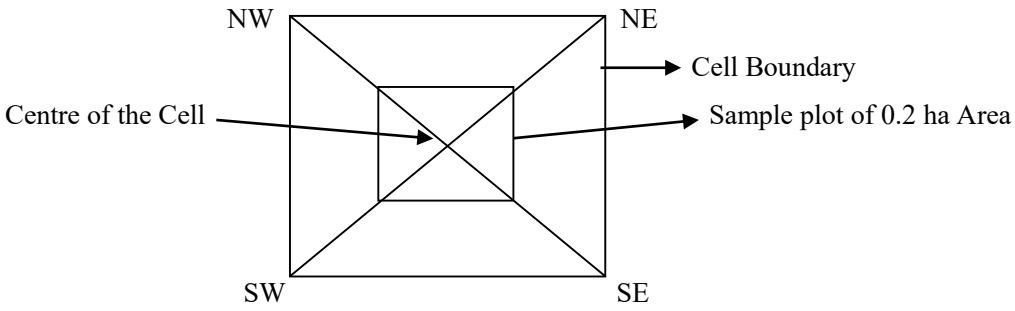
(iv) The area estimated for enumeration (in hectare) is divided by 0.20 to estimate the number of samples plots, each of 0.20 hectare area.

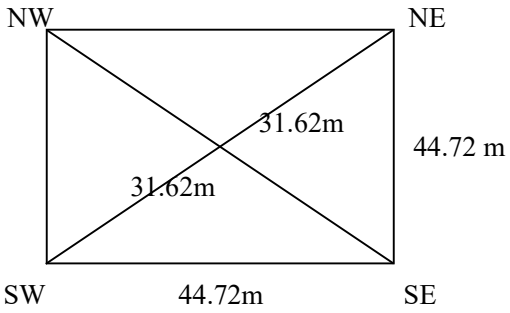
(v) The total number of valid cells in a sacred grove is divided by the number of sample plots. The remainder and the quotients are respectively the serial number of the cell in which the first sample plot is to be laid and the interval in serial number of two consecutive cells to be selected for laying of sample plots. For example, to identify the cells for laying 10 sample plots in a sacred grove having 25 valid cells, 25 is divided by 10. The remainder *i.e.* 5 is serial number of the cell in which first sample plot is laid and quotient *i.e.* 2, is interval in serial number of two consecutive cells to be selected for laying sample plots. In this case, sample plots are laid in cells having serial number 5, 7, 9, 11, 13, 15, 17, 19, 21, 23.

(vi) The center of a sample plots, having 0.2 ha. area is co-terminus with the center of the identified cell (*i.e.* inter-section of two diagonals of the cell).

2.2.4 Laying of Sample Plots on Ground

Location of the centre point of each cell identified for laying of sample plots is identified on the ground by using a hand-held GPS by feeding the geo-coordinates (latitude- longitude) of the central point. Location of the centre point is marked on the ground by fixing a stout wooden peg of 10 cm dia. and 1.5 meter height. From the centre point 31.62 m distance is measured in NE, SE, NW and SW directions *i.e.,* in the direction of 45°, 135°, 225° and 315° to mark location of four corner points. Location of each of these corner points is marked on ground by fixing a 1.50 meter high wooden peg. The corner points are joined by a nylon rope to form the desired sample plot of 0.2 hectare area. Each side of the plot is measured to confirm that the same is 44.72 metres. Wherever feasible, ranging rods or flags are fixed at the corner points for reference during the enumeration. While laying sample plots, all distances are measured horizontally. In case a part of a sample plot laid in a cell located on boundary of the sacred grove falls outside the sacred grove, the same is shifted to ensure that the entire sample plot falls within the sacred grove. Due to tough terrain or any other reason, if a cell selected for enumeration is not approachable, the sample plot is laid in the adjoining cell.





2.2.5 Data collection

After reaching the sacred grove some of the qualitative information are recorded based on ocular observations and interaction with village elders and other persons acquainted with history and management of the sacred grove. Other quantitative data and qualitative information are collected during the enumeration. The Information and data collected during the enumeration are recorded in **Sacred Grove Plot Description Form** and **Sacred Grove Plot Enumeration Form**. A brief summary of information to be noted in each of these two forms are given below:

2.2.5.1 Sacred Groove Description Form

Only one Sacred Grove Description Form is filled for each sacred grove. In this form general information about the sacred grove is recorded based on ocular observations and local enquiry.

2.2.5.2 Sacred Groove Plot Enumeration Form

In this form, diameter at breast height and height of all trees having diameter at breast height (1.37m) of 10 cm and above are recorded. The dead tress having less than 70% utility and all trees having diameter at breast height less than 10 cm are disregarded. If a plot contains bamboo, each bamboo clump is considered as a tree for the purpose of Sl. No., name of species and height except for girth, for which number of culms in the clump are recorded. For filling-up this form following instructions are followed:

Item	Description/Definitions
Plot No	in two digits from the map
Name of the District	in text form
Name of the Sub-division	in text form
Name of Block	in text form
Name of the grove	in text form
Name of village/nearest village	in text form
Syiemship/Dolloiship	in text form
Distance from road	in text form
Coordinates of plot centre	from map in numeric form
Total No. of trees enumerated	in three digits
Sl. No. of tree	in three digits
Species Name	in text form, - the name should preferably be botanical otherwise common/local names may also be written
Girth of tree	in cms in three digits
Tree height	in metres in two digits

2.2.6 Field Measurements

The following two measurements are taken for each tree standing in a sample plot:

(a) Diameter at Breast Height (DBH) over bark

Girth of the tree is measured at breast height *i.e.,* 1.37m above the ground with the help of a measuring tape to the nearest cm and recorded in the field form in 3 digits *e.g.,* 85 cm girth is recorded as 085cm. Wherever required, diameter of the tree over bark (DBH O.B.) is measured with the help of a calliper keeping all the arms of the calliper horizontal. For the sake of uniformity, girth of a tree is only measured. In hilly terrain, the measurements are taken at 1.37 meters above the ground towards uphill side.

(b) Height

The height of a tree is measured in meter to the nearest even number from bottom of the tree to the top of the tree with the help of ***Abney's Level*** or ***Blume Leiss Hypsometer***. In hilly terrain, bottom of the tree is considered in the uphill side and corrections are applied for the slope. The height is recorded in two digits in the field form.

2.2.7 Equipment and Other Materials Used by Each Survey Team

The following equipment and other materials are used by each survey team:

(i)	Silva Compass or any other compass	1 No.
(ii)	GPS handset with extra batteries	1 No.
(iii)	Hypsometer/Abney's level for height measurement	1 No.
(iv)	30-50 m (self-rolling) measuring tape or rope/chain marked at every 10 meters	2 no.
(v)	Digital Camera with charger	1 No.
(vi)	Caliper	1 No.
(vii)	Field Maps	As required
(viii)	Field Forms	As required
(ix)	Field Manual	As required
(x)	Note Books	As required
(xi)	Pen & Markers	As required
(xii)	Hand calculator	1 No.
(xiii)	*Khukhri/ Dao*	2 No.
(xiv)	Measuring tapes (2 m length)	2 No.

2.2.8 Estimation of Volume of a Tree

Volume of each enumerated tree is calculated by using the local volume equations developed by the Forest Survey of India, Dehradun for Meghalaya State. Tree species for which volume equation for Meghalaya are not available, volume equation of adjoining State of Assam have been used. A list of volume equations used for estimating the volume of the trees is as below:

Local Volume Equations for Forests in Meghalaya

(volume in m^3)

1. *Albizzia* spp 2. *Bombax ceiba* 3. *Duababga sonneratiodes*	V= 0.29208+0.00092412 D^2 (dia in cm)
4. *Amoora wallichii* 5. *Gmelina arborea* 6. *Kydia calycina*	V= - 0.0087 +0.003675D+0.0007398D^2(dia in cm)
7. *Anthocephalus cadamba* 8. *Schima wallichii*	V= - 0.0189+0.0008073D^2(dia in cm)

9. *Lannea coromandelica* } V= -1.391-0.14129D+0.001645D^2+0.90411√D (dia in cm)
10. *Toona ciliata* }
11. *Pinus khasiana* – V = 0.0232 – 0.011613D+0.0011549D^2 (dia in cm)
12. *Shorea robusta* } V= - 0.027862+0.0010882D^2(dia in cm)
13. *Tectona grandis* }
14. *Artocarpus chaplasha* – V = 1.65081-4.57531√D+11.62114 D^2
15. *Callicarpa* spp – √V = - 0.04506+2.33466 D
16. *Careya arborea* – √V = 0.23738 +2.33289D+0.48512√D
17. *Casearia* spp – V = 0.14031-2.06478 D+11.25750 D^2
18. *Cassia siamea* – V = 0.5159-0.53331D+3.46016 D^2+10.18473 D^3
19. *Cinnamomun* spp – V = 0.14885-1.62875D+5.93114 D^2+11.73286 D^3
20. *Dillenia pentagyna* – √V = 0.31202 +4.75915D-1.83940√D
21. *Dillenia indica* – √V = 0.05376+3.73731D-0.79622√D(At P-88 of book)
22. *Dysoxylum linectiferum* – V = 0.04752+0.50667D+1.88433 D^2+11.30632 D^3
23. *Elaeocarpus* spp – √V = 0.43483+5.72522D-2.59907√D
24. *Emblicia officinalis* – V = 0.13734-2.49039D+15.59566 D^2-11.06205 D^3
25. *Erythrina* spp – V = - 0.07803+1.70258D-9.16180 D^2+33.91455 D^3
26. *Ficus* spp – √V = 0.3629+3.95389D-0.84421√D
27. *Grewia* spp – V = - 0.44075+7.49221D-36.09962 D^2+71.91238 D^3
28. *Macaranga denticulata* – V = 0.13333-2.18825D+13.12678 D^2
29. *Mallotus philippinensis* – V = 0.14749-2.87503D+19.61977 D^2-19.11630 D^3
30. *Michelia* spp – V = 0.23057-3.51494D+17.62619 D^2
31. *Quercus* spp – V = 0.000295-0.0079835 D+0.000862 D^2 (Dia in cm)
32. *Rhododendron* spp – V = - 0.08934+0.70730D +2.139141D^2
33. *Spondias pinnata* – √V = 0.49487+6.18662 D-2.95076√D
34. *Sterculia villosa* – V = 0.27909-3.26515D+13.46829 D^2
35. *Terminalia* spp – V = 0.50603-6.64203 D+25.23882 D^2 -9.19797 D^3
36. *Vitex penducularis* – V = - 0.16386+2.23116D-7.00969 D^2 +22.13099 D^3
37. Rest of the species – V= - 0.081297+0.0010659D^2 (dia in cm)

V = Volume in cubic metres (m^3)

D = Diameter in meters. In some equations it is in cm which it has been mentioned in the concerned equations.

2.3 SACRED GROVES IDENTIFIED FOR MAPPING AND INVENTORY OF GROWING STOCK

Forest Resources Survey Division in the Forest and Environment Department, Government of Meghalaya has initiated mappings of sacred grove in the State. So far 153 sacred groves as per details given in table 2.1 have been identified for mapping and inventory of growing stock. All these sacred groves have been mapped after boundary survey with the help of hand-held GPS.

TABLE 2.1: SACRED GROVES IDENTIFIED FOR MAPPING AND INVENTORY OF GROWING STOCK

Sl. No.	Name of Sacred Grove	Area (in ha.)
1	Law Adong Laitkynsew at Mawkdar	3.79
2	Law Lyngdoh Lyngiong	62.42
3	Law Adong Nongrimbah Mawlangwir	34.65
4	Law Adong Laitkynsew at Lumlaitdihum	17.65
5	Salariang Jakrem	10.5
6	Twahsamparat	29.232
7	Law Lyngdoh Iingblei Nonglyngkien	2.39
8	Law Lyngdoh Mawlot Phyllut	16.54
9	Law Lyngdoh (Lyngdoh Nonglyngkien)	5.234
10	Law Adong Nongsynrieh Maharam Syiemship	9.83
11	Khlaw Bri Raij Bhorymbong, Raitong	10.000
12	Law Adong Sawkpoh Wanniang	5.15
13	Law Lyngdoh Rngaid Nonglang	2.04
14	Rei-missiom Lawadong of Photja-ud	63.71
15	Law Adong Phlangwanbroi	9.65
16	Law Adong of Raid Raitong at Lumprah Mawkhyrdop Raitong	54.9
17	Khlo Blai Lyngdoh at Raliang village,	3.68
18	Jri-Pastieh Khlo Blai of Raij Khonshnong Raliang Elaka	3.3
19	Khlaw Blai Ryngkaw Khonshnong Elaka Raliang	55.62
20	Law Lyngdoh Mawnai under Hima Nongkhlaw	23.7
21	Law Adong Phud Synrang	1.18
22	Law Adong Wahthlong	0.69

Sl. No.	Name of Sacred Grove	Area (in ha.)
23	Law AdongWah Umsohphie	2.92
24	Law Lyngdoh Lait Raid Mawkhap	4.88
25	Inkhrong Sacred Groves of Khlieh Shnong Sohra	11.39
26	Khlieh Shnong Sohra Syiemship at Mawphon Syiem	15.932
27	Umiong Protected Forest of Khlieh Shnong, Sohra	200.58
28	Wah Shangiar Law Adong at Mawmluh	24.113
29	Law Adong Mawkulai at Mawmluh	38.521
30	Law Kyntang Mawsawa	16.43
31	Kyllai Langsngun Law AdongKur-Paliar Lai Kpoh Demnar	39.36
32	Swer Dohling Sacred Grove	73.32
33	Khloo Thangbru Umsymphu	19.6
34	Khloo Pohblai Mooshutia	33.5
35	Khloo Langdoh Kur Pyrtuh, Sohmynting	15.4
36	Khloo Blai Chyrmang Sein Raij Kongwasan Chyrrmang Kmai	7.04
37	Khloo Blai Sein Raij Tuber	89.43
38	Khloo Blai Ka Raij U Langdoh Ionglang (Mootyrshiah)	15.12
39	Mynso (Sula lynter) Ka khloo thangbnai Suta lynter sein raij Mynso	3.243
40	Khloo Blai Mynso	0.852
41	Law Adong Mawhiang	103.44
42	Law Adong Pamsanngut	51.002
43	Law Adong Nongsiej Laitwir Kmawan	5.866
44	Law Adong Nongsiej Laitwir Kmawan Nongdom	17.189
45	Law Adong Lait Mawpat	66.273
46	Law Kyntang Lumsymper	78.189
47	Law Kyntang Kmawan Rum	1.933
48	Law Kyntang Khongsit Clan, MawlumTyrsad	1.839
49	Law Adong Khongsit Clan, MawlumTyrsad	195.07
50	Law Adong Kur Myrthong	107
51	Law Adong Mawlynnu	39.628
52	Law Adong Mawtangor	3.783
53	Law Lyngdoh Law Adong Kur Sangriang	16.386
54	Lawkyntang Ryngkew Swer	11.07
55	Law Adong Wahsier	34.69
56	Law Adong Sawktang	18.52
57	Law Adong Law Madan	11.68
58	Law Lyngdoh Raid Wahkhen	1.97
59	Law Adong Tyrjut Raid Nongkhlieng	13.52

Sl. No.	Name of Sacred Grove	Area (in ha.)
60	Law Adong Niangblah	22.0
61	Law Adong Law Nongshlem	43.94
62	Law Kyntang Ka Kur Sakwang	6.26
63	Liewlong Khlaw Kur Marwein	52.032
64	Lawpyllun Law Adong Kur Iawphniaw	52.03
65	Law Lyngdoh Shillong Raid Mawkhap	0.26
66	Law Adong Sohum	1.17
67	Law Adong Wah Marobin	1.9
68	Law Adong Wahing Bah	2.67
69	Law Adong Them-U-Mud	1.05
70	Law Adong Tad Latom at Swer	17.58
71	Law Adong Law Kait	0.58
72	Law Adong Thymmai	1.32
73	Law Adong Wahthlong	1.9
74	Law Adong Sohmyndong	0.8
75	The Law Adong Law Suid Noh	1.16
76	Law Adong Law Pjaih	6.04
77	Law Adong Iapmoit	3.661
78	Law Adong Law Arliang	11.07
79	Law Adong Kshaid u Rai	3.42
80	Law Adong Kynrem Umwai	9.203
81	Law Adong Nurbah	2.001
82	Law Kyntang Kyntoit Nongduh	0.511
83	Law Kyntang Kyntoit Diengsiar	0.675
84	Law Adong Lum Kyrphei	24.138
85	Law Adong Rikaksem	9.567
86	Law Kyntang Umkyrsan	0.27
87	Lawkyntang Mawsaw Kein Kalah	0.785
88	Law Kyntang Mawthang Sohkhyllung	0.2775
89	Law Kyntang Diengkain	1.246
90	Law Kyntang Kyntoit Mawriang	0.28
91	Law Adong Mawthoh	3.02
92	Khlo Blai Moopasah Khonshnong	0.6
93	Khlo Blai Kur Biam	0.08
94	Khlo Blai Pohpyrda	4.36
95	Law Kyntang Mawsahep	1.0
96	Khlo Blai Pohpuja	0.63

Sl. No.	Name of Sacred Grove	Area (in ha.)
97	Khlo Blai Mynthliang	0.33
98	Khlo Blai Rtiang	0.47
99	Khlaw Blai Iongbong	1.79
100	Khlaw Blai Tyrsha	0.51
101	Law Kyntang Nongrim Kheinbsap	1.43
102	Law Adong Kohlu Khyrdop	1.19
103	Law Lyngdoh Synryn-ew Khap Mawjuta	1.01
104	Law Lyngdoh Kharai	1.43
105	Law Adong Kliar Umrem	2.59
106	Law Adong Wah Rangmuh	2.58
107	Law Kyntang Nohksiar	0.13
108	Law Kyntang Mawbang	0.11
109	Law Kyntang Ka Kruh (Tken)	1.49
110	Law Kyntang Mawbrai Kur Ryngksai	0.146
111	Law Lyngdoh Erbamon	0.24
112	Law Kyntang of Smti Philo & Shri August Tynsong	0.99
113	Sacred Groves of Nongsiej Laitwir Kmawan Clan at Shanglop Nongspung Syiemship	15.715
114	Protected Forest of Mawteibah Village at Lyngkha U Jon	134.96
115	Law Adong Mawlynnu	62.648
116	Law Lyngdoh Umjapiar, Mawskuin	9.91
117	Law Lyngdoh Lynching, Mawskuin	47.06
118	Law Adong WahShadsngi Nongmadan, Shadsngi	1.15
119	Law Adong Kor at Ladmawphlang	7.16
120	Mawphlang Sacred grove	78
121	Law Adong of Pynden Sakwang	9.89
122	Law Adong Tyllong Um Kyrwiang of Hilland Village	16.2
123	Law Adong Diri of Mawranglang Village	6.93
124	Law Adong Synrai-Hu	5.38
125	Law Adong Kur Nongrem Khain Nongdiat	6.93
126	Law Adong Kur Nongrem Khain Nongdiat	6.94
127	Law Adong Saw Kpoh Kur Nonglang Nongsynrieh	22.72
128	Pon Pyrnon Law Adong of Mawranglang	9.0
129	Law Lyngdoh Law Adong Kur Lai-Kynja, Rangblang	14.81
130	Lum-niang Ram Law Lyngdoh of Kur Myrthong	144.39
131	Sacred Groves of Raid Nongpoh	53.71
132	Khlaw Bri Raij Bhorymbong	10.0

Sl. No.	Name of Sacred Grove	Area (in ha.)
133	Jri Tyngkong Lawadong Shnong Umtung	10.12
134	Law Adong of Mawtneng	6.942
135	Khlaw Shnong Mawlong Nongtluh Raid Nongtluh Mylliem Syiemship	9.0
136	Khlaw Balang Presbyterian Mawlong Nongtluh Raid Nongtluh Mylliem Syiemship	8.0
137	Law Kyntang and Law Shnong of Sohlait Thymmai Raid Nongkharai Elaka Nongpoh Sirdarship	8.0
138	Law Balang Sohlait Thymmai Raid Nongkharai Elaka Nongpoh Sirdarship	4.0
139	Law Kyntang Umling Lambrang, Riad Nonglyngdoh Elaka Nongpoh Sirdarship	76
140	Khlaw Shnong Nartap Raid Nongkharai Elaka Nongpoh Sirdarship	34
141	Khlaw Shnong Saiden Hima Khatar Lyngdoh Elaka Nongpoh Sirdarship	12
142	Law Kyntang ka Nongbah Raid Nongtluh Mylliem Syiemship	66
143	Khlaw Blai Pohmurang Dongwah shnong Khlaw Blai Kur Biam Raliang	2.04
144	Khlaw Blai Iaw Elaka Raliang Dolloiship	0.68
145	Myllep Khlo Blai of Raij Khonshnong at Umdeinlieng, Raliang	11.85
146	Batisa Kur Ryngksai Iingbah Umku Darang	0.15
147	Iarsyrma Kur Ryngksai Iingbah Darang	0.06
148	Khadsabad Kur Ryngksai Iingbah Darang	0.37
149	Laremtam Sedar Sacred Grove	1.0
150	Amprai Sacred Grove	4.0
151	Tken Lyngdoh Sacred Grove	3.0
152	Ki Pdeng Ki Lyngdoh Sacred Grove	1.0
153	Phlang Sohniriang	0.5
Total		**3,040**

2.4. SACRED GROVES FOR WHICH INVENTORY OF GROWING STOCK HAS BEEN COMPLETED

Forest Resources Survey Division has completed inventory of growing stock in 112 sacred groves.

Results of the inventory of growing stock undertaken during the first phase in 20 sacred groves have been published as Vol-I of this publication in 2017. Details of these sacred groves are given in Table 2.2. below

TABLE 2.2: DETAILS OF SACRED GROVES INCLUDED IN INVENTORY OF SACRED GROVES IN MEGHALAYA (VOL.-I)

Sl. No.	Name of Sacred Grove	District	Area (Ha.)	No. of Sample Plots
1	Law Lyngdoh Mawlot Phyllut	South West Khasi Hills	16.540	15
2	Law Adong Nongrimbah Mawlangwir	South West Khasi Hills	34.650	36
3	Law Adong Nongsynrieh Maharam Syiemship	South West Khasi Hills	9.830	100%
4	Salar–iang Jakrem	South West Khasi Hills	10.500	10
5	Twahsamparat, Tynnai	South West Khasi Hills	29.320	29
6	Law Adong Photja-ud	South West Khasi Hills	8.590	100%
7	Law Lyngdoh Rngaid Nonglang	South West Khasi Hills	2.040	100%
8	Law Lyngdoh Iingblei Nonglyngkien	South West Khasi Hills	2.390	100%
9	Law Lyngdoh-Lyngdoh Nonglyngkien	South West Khasi Hills	5.234	100%
10	Law Adong Sawkpoh Wanniang	South West Khasi Hills	5.150	100%
11	Law Adong Phlangwanbroi, Hima Malai Sohmat	East Khasi Hills	9.650	100%
12	Law Lyngdoh Lyngiong, Hima Lyngiong	East Khasi Hills	62.420	31
13	Law Adong Raid Raitong	Ri-Bhoi	54.900	25
14	Khlaw Bri Raij Bhorymbong, Raitong	Ri-Bhoi	10.000	10
15	Law Lyngdoh Mawnai under Hima Nongkhlaw	West Khasi Hills	23.700	25
16	Law Adong Laitkynsew at Mawkdar	East Khasi Hills	3.790	100%
17	Law Adong Laitkynsew at Lumlaitdihum	East Khasi Hills	17.650	17
18	Khlo Blai Lyngdoh at Raliang village of Raliang Elaka	West Jaintia Hills	3.680	100%
19	Khlaw Blai Ryngkaw Khonchnong Elaka Raliang Doloiship	West Jaintia Hills	55.620	27
20	Jri-Pastieh Khlo Blai of Raij Khonchnong Raliang Elaka	West Jaintia Hills	3.300	100%
	Total		**368.954**	

Results of the inventory of growing stock undertaken during second phase in 20 sacred groves have been published as Vol-II of this publication in 2022. Details of these sacred groves are given in Table 2.3. below:

TABLE 2.3: DETAILS OF SACRED GROVES INCLUDED IN INVENTORY OF SACRED GROVES IN MEGHALAYA (VOL.-II)

Sl. No.	Name of Sacred Grove	District	Area (ha.)	No. of Sample Plots
1	Law Adong Phudsynrang Shyiap	East Khasi Hills	1.180	100%
2	Law Adong Wahthlong	East Khasi Hills	0.690	100%
3	Law Adong Umsohphie	East Khasi Hills	2.920	100%
4	Law Adong Lait Raid Mawkhap	East Khasi Hills	4.880	100%
5	Ingkhrong Sacred Groves Sohra Khliehshnong	East Khasi Hills	11.390	11
6	Mawphon Syiem Sacred Groves at Khliehshnong, Sohra	East Khasi Hills	15.932	16
7	Law Adong Umiong at Khlieh shnong, Sohra	East Khasi Hills	200.580	100
8	Law Adong Wah Shiangiar at Mawmluh	East Khasi Hills	24.113	24
9	Law Adong Mawkulai at Mawmluh	East Khasi Hills	38.521	38
10	Law Adong Mawsawa at Mawmluh	East Khasi Hills	16.430	16
11	Kyllai-Lyngsnguin Law Lyngdoh Kur Lai Kpoh Paliar, Demnar	South West Khasi Hills	39.360	39
12	Law Adong Swer Dohling	East Khasi Hills	73.320	37
13	Ka Khloo Thangbru Umsympu, Mukhaialong village	East Jaintia Hills	19.600	20
14	Ka Khloo Pohblai Mooshutia, Mukhaialong village	East Jaintia Hills	33.500	33
15	Ka Khloo Langdoh Kur Pyrtuh, Sohmynting	West Jaintia Hills	15.400	15
16	Ka Khloo Blai Sein Raij Kongwasan, Chyrmang	West Jaintia Hills	7.040	100%
17	Ka Khloo Blai Sein Raij Tuber	East Jaintia Hills	89.430	44
18	Ka Khloo Blai ka Raij Langdoh Ionglang, Mootyrshiah	West Jaintia Hills	15.120	15
19	Sula Lynter Law Kyntang Mynso	West Jaintia Hills	3.243	100%
20	Khloo Blai Mynso	West Jaintia Hills	0.852	100%
	Total area =		**613.501**	

Results of the inventory of growing stock undertaken during the third phase in 24 sacred groves have been published recently (2024) as Vol-III of this publication. Details of these sacred groves are given in Table 2.4. below:

TABLE 2.4: DETAILS OF SACRED GROVES INCLUDED IN INVENTORY OF SACRED GROVES IN MEGHALAYA (VOL.-III)

Sl. No	Name of Sacred Grove	District	Area (ha.)	No. of Sample Plots
1	Law Adong Mawhiang at Sawsymper	East Khasi Hills	103.440	52
2	Law Adong Pamsanngut Sirdarship at Tyrsad	East Khasi Hills	51.002	26
3	Law Adong Nongsiej Laitwir Kmawan at Bisap Tdei Pongkung	East Khasi Hills	5.866	100%
4	Law Adong Nongsiej Laitwir Kmawan Nongdom at Lait Nomlang	East Khasi Hills	17.189	17
5	Law Adong of Lait Mawpat at Wah Mawpat	East Khasi Hills	66.273	33
6	Law Kyntang Lumsymper at Sawsymper, Pongkung-Lang Symphut	East Khasi Hills	78.189	39
7	Law Kyntang of Kmawan Rum at Khlar Rumphet	East Khasi Hills	1.933	100%
8	Law Kyntang of Khongsit Clan of MawlumTyrsad, Mylliem Syiemship	East Khasi Hills	1.839	100%
9	Law Adong of Khongsit Clan at MawlumTyrsad Mylliem Syiemship	East Khasi Hills	195.070	98
10	Law Adong of Kur Myrthong at Umlangmar, Nongspung Syiemship	East Khasi Hills	107.000	54
11	Law Adong of Mawlynnu at Mawksanwar of Raid Saw Symper	East Khasi Hills	39.628	40
12	Law Adong of Mawtangor village Pnenbah Mawpait	East Khasi Hills	3.783	100%
13	Law Adong Sangriang, Sangriang	West Khasi Hills	16.380	40
14	Law Kyntang Ryngkew Swer	East Khasi Hills	11.070	11
15	Law Adong Wahsier, Swer	East Khasi Hills	34.690	34
16	Law Adong Sawktang, Mawmluh	East Khasi Hills	18.520	18
17	Law Adong Law Madan, Mawmluh	East Khasi Hills	11.680	12
18	Law Lyngdoh Raid Wahkhen	East Khasi Hills	1.970	100%
19	Law Adong Tyrjut Raid Nongkhlieng	East Khasi Hills	13.520	14
20	Law Adong Niangblah, Lad Mawphlang	East Khasi Hills	22.000	22
21	Law Adong Nongshlem, Mawmihthied	East Khasi Hills	43.940	44
22	Law Kyntang Ka Mukertilla Raid Mukertilla	East Khasi Hills	6.260	100%
23	Wah Rilong Khlaw Kur Marwein at Umkrem	West Khasi Hills	52.032	26
24	Lawpyllun Law Adong Kur Iawphniaw Mawsaw	West Khasi Hills	52.030	26
Total				**955.304**

Results of the inventory of growing stock undertaken during the fourth phase in 24 sacred groves are being published as Vol-IV of this publication. Details of these sacred groves are given in Table 2.5. below:

TABLE 2.5: DETAILS OF SACRED GROVES INCLUDED IN INVENTORY OF SACRED GROVES IN MEGHALAYA (VOL.-IV)

Sl. No	Name of Sacred Grove	District	Area (ha.)	No. of Sample Plots
1	Law Lyngdoh Shillong Raid Mawkhap	East Khasi Hills	0.26	100%
2	Law Adong Sohum	East Khasi Hills	1.17	100%
3	Law Adong Wah Marobin	East Khasi Hills	1.9	100%
4	Law Adong Wahing Bah	East Khasi Hills	2.67	100%
5	Law Adong Them-U-Mud	East Khasi Hills	1.05	100%
6	Law Adong Tad Latom	East Khasi Hills	17.58	17
7	Law Adong Kait	East Khasi Hills	0.58	100%
8	Law Adong Thymmai	East Khasi Hills	1.32	100%
9	Law Adong Wahthlong	East Khasi Hills	1.9	100%
10	Law Adong Sohmyndong	East Khasi Hills	0.8	100%
11	Law Adong Suidnoh	East Khasi Hills	1.16	100%
12	Law Adong Pjaih	East Khasi Hills	6.04	100%
13	Law Adong Iapmoit	East Khasi Hills	3.661	100%
14	Law Adong Arliang	East Khasi Hills	11.07	10
15	Law Adong Kshaid u Rai	East Khasi Hills	3.42	100%
16	Law Adong Kynrem Umwai	East Khasi Hills	9.203	100%
17	Law Adong Nurbah	East Khasi Hills	2.001	100%
18	Law Kyntang Kyntoit Nongduh	East Khasi Hills	0.511	100%
19	Law Kyntang Kyntoit Diengsiar	East Khasi Hills	0.675	100%
20	Law Adong of Lum Kyrphei	East Khasi Hills	24.138	24
21	Law Adong Rikaksem	East Khasi Hills	9.56	100%
22	Law Kyntang Umkyrsain	East Khasi Hills	0.27	100%
23	Law Kyntang Mawsaw Kein Kalah	East Khasi Hills	0.785	100%
24	Law Kyntang Mawthang Sohkhyllung	East Khasi Hills	0.277	100%
	Total		102.001	

Results of the inventory of growing stock undertaken during the fifth phase in 24 sacred groves will be published as part of this publication (Vol-V). Details of these sacred groves are given in Table 2.6. below:

TABLE 2.6: DETAILS OF SACRED GROVES INCLUDED IN INVENTORY OF SACRED GROVES IN MEGHALAYA (VOL.-V)

Sl. No	Name of Sacred Grove	District	Area (ha.)	No. of Sample Plots
1	Law Kyntang Diengkain	East Khasi Hills	1.246	100%
2	Law Kyntang Kyntoit Mawriang	East Khasi Hills	0.28	100%
3	Law Adong Mawthoh	East Khasi Hills	3.02	10
4	Khlo Blai Moopasah Khonshnong	West Jaintia Hills	0.6	100%
5	Khlo Blai Kur Biam	West Jaintia Hills	0.08	100%
6	Khlo Blai Pohpyrda	West Jaintia Hills	4.36	10
7	Law Kyntang Mawsahep	East Khasi Hills	1.0	100%
8	Khlo Blai Pohpuja	West Jaintia Hills	0.63	100%
9	Khlo Blai Mynthliang	West Jaintia Hills	0.33	100%
10	Khlo Blai Rtiang	West Jaintia Hills	0.47	100%
11	Khlaw Blai Iongbong	West Jaintia Hills	1.79	100%
12	Khlaw Blai Tyrsha	West Jaintia Hills	0.51	100%
13	Law Kyntang Nongrim Kheinbsap	East Khasi Hills	1.43	100%
14	Law Adong Kohlu Khyrdop	East Khasi Hills	1.19	100%
15	Law Lyngdoh Synryn-ew Khap Mawjuta	East Khasi Hills	1.01	100%
16	Law Lyngdoh Kharai	East Khasi Hills	1.43	100%
17	Law Adong Kliar Umrem	East Khasi Hills	2.59	10
18	Law Adong Wah Rangmuh	East Khasi Hills	2.58	10
19	Law Kyntang Nohksiar	East Khasi Hills	0.13	100%
20	Law Kyntang Mawbang	East Khasi Hills	0.11	100%
21	Law Kyntang Ka Kruh (Tken)	East Khasi Hills	1.49	100%
22	Law Kyntang Mawbrai Kur Ryngksai	East Khasi Hills	0.146	100%
23	Law Lyngdoh Erbamon	East Khasi Hills	0.24	100%
24	Law Kyntang of Smti Philo & Shri August Tynsong	East Khasi Hills	0.99	100%
	Total		**27.65**	

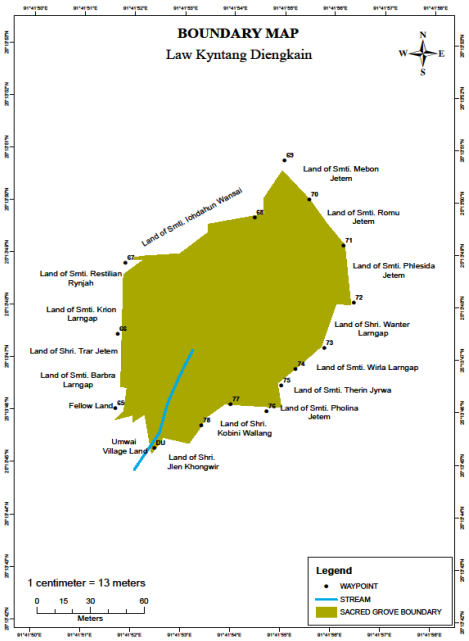
CHAPTER-III

DESCRIPTION OF SACRED GROVES

3.1. *LAW KYNTANG DIENGKAIN*

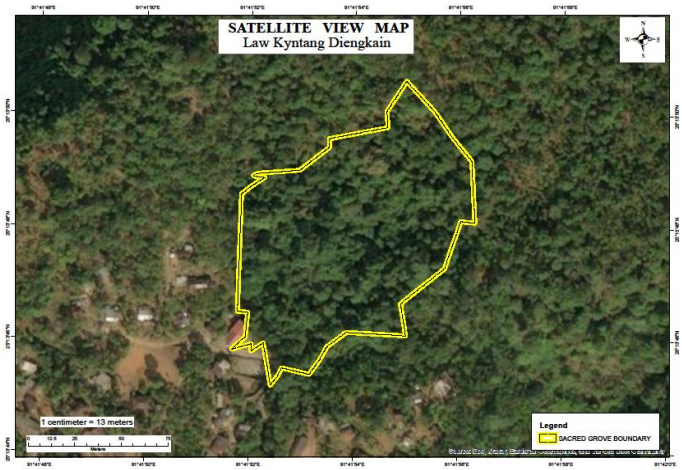
3.1.1 Location

Law Kyntang Diengkain is situated in East Khasi Hills District of Meghalaya at Umwai village under *Mawlong Sirdarship*. It covers an area of 1.246 ha and lies between 25° 13′45" to 25° 13′ 50″ N latitude and 91° 41′ 52″ to 91° 41′ 57″ E Longitude at an altitude of 492 m above mean sea level. It is bounded in the North by land of Smti Iohdahun Wansai and land of Smti Mebon Jetem, in the East by land of Romu Jetem, land of Phlesida Jetem, land of Shri Wanter Larngap, land of Shri Wirla Larngap and land of Smti Theirin Jyrwa, South by land of Shri Pholina Jetem, land of Shri Kobini Wallang, land of Shri Jlen Khongwir, and Umwai Village land and in the West by land of Smi Restilian Rynjah, land of Smti Kroin Larngap, land of Shri Trar Jetem land of Smti Barbra Larngap and Fellowship land. The grove is located at 72 km from Shillong and is accessible by Shillong-*Umwai* Road followed by a 400 m foot trek.

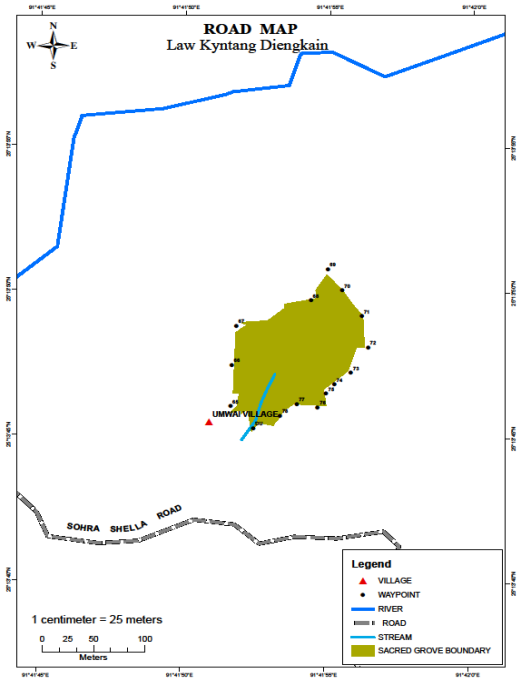


3.1.2 Brief History

Law Kyntang Diengkain is in existence for several centuries. This forest is owned by the village community and is managed by the *Dorbar* of *Umwai* village. Rituals are not performed anymore *in this grove as* the local population has embraced Christianity but the people still preserve this relic forest for environmental benefits. This forest serves as a source of potable water for the village. Entry inside this grove is not prohibited but felling of tress is strictly prohibited and punishable under the rules framed by the village



Dorbar. Biotic pressures such as encroachments, hunting, poaching and illegal felling of trees are found to be absent from this forest.



3.1.3 Geography and Climate

Topography of the grove is undulating in nature with slope varying from 0.2° to 30°. Major part of the *Law Kyntang Diengkain* falls under Southern and Southwest aspects with small patch in the Western Aspect. Soil texture is sandy loam with no coarse fragments. Soil consistency is slightly compact. Soil is black in colour and soil depth is shallow ranging from 15 cm to 30 cm. One stream namely; *Umsang Sabon* flows through this *Law Kyntang*.

Winter season starts from end of October and lasts till March of the next year. It receives very high rainfall during the monsoon season from April to September.

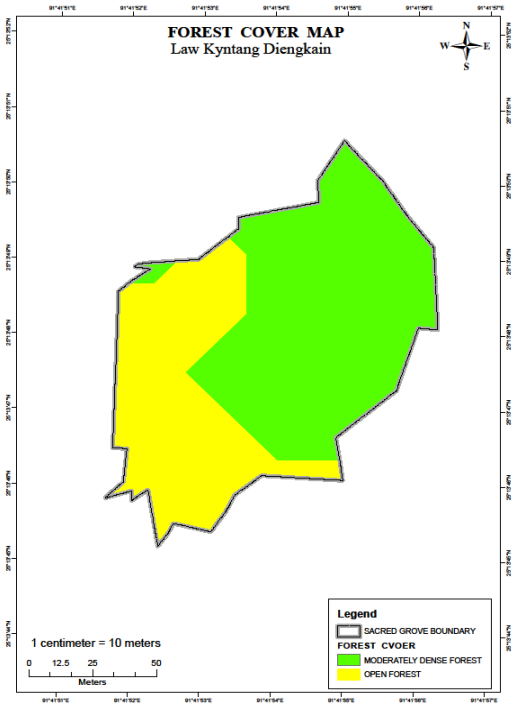
3.1.4 Forest Type

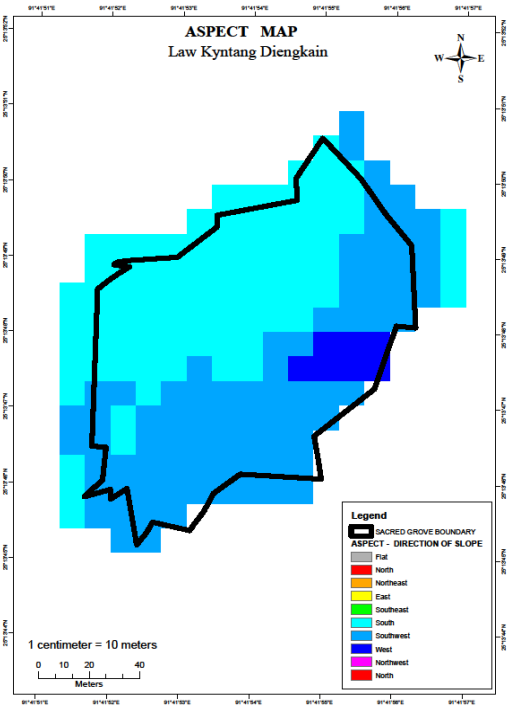
As per the Champion and Seth classification (1968), forests found in the sacred grove are of the ***Type 1B/C3 Cachar Tropical Evergreen Forest***

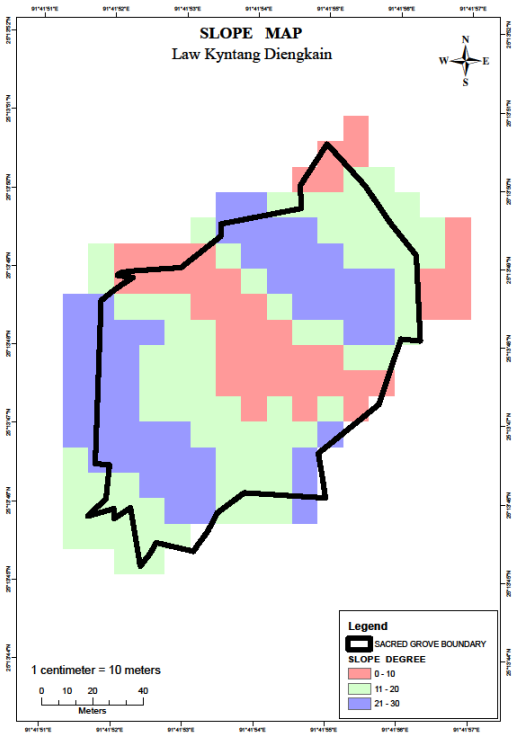
3.1.5 Forest Cover

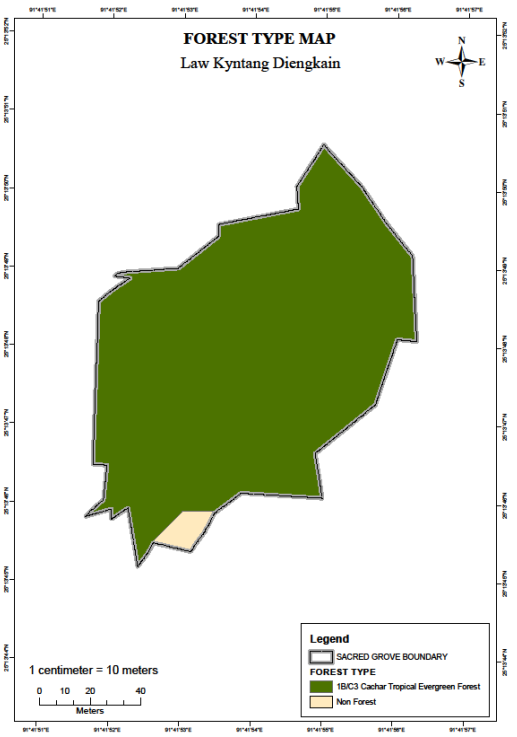
As per the India State of Forest Report-2021 published by the Forest Survey of India, Dehradun, forest cover in the *Law Kyntang Diengkain* is as below:

Forest Cover	**Area (ha.)**	**% of total Area**
Very Dense Forest (> 70%)	0	0
Moderately Dense Forest (40 %-70 %)	0.76	60.68
Open Forest (10% - 40%)	0.49	39.44
Scrub Forest (<10%)	0	0
Non-Forest	0	0
Total	**1.25**	**100**


FOREST COVER MAP
Law Kyntang Diengkain
N
W
E
S
1 centimeter = 10 meters
0 12.5 25 50
Meters
Legend
SACRED GROVE BOUNDARY
FOREST CVOER
MODERATELY DENSE FOREST
OPEN FOREST

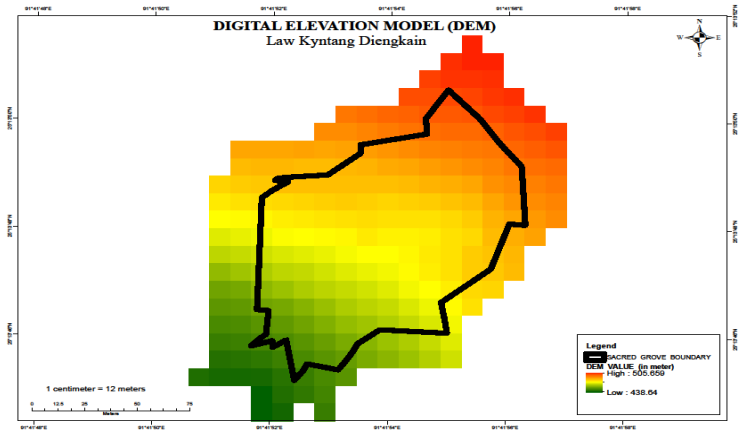

ASPECT MAP
Law Kyntang Diengkain
N
W
E
S
1 centimeter = 10 meters
0 10 20 40
Meters
Legend
SACRED GROVE BOUNDARY
ASPECT - DIRECTION OF SLOPE
Flat
North
Northeast
East
Southeast
South
Southwest
West
Northwest
North


SLOPE MAP
Law Kyntang Diengkain
N
W
E
S
1 centimeter = 10 meters
0 10 20 40
Meters
Legend
SACRED GROVE BOUNDARY
SLOPE DEGREE
0 - 10
11 - 20
21 - 30


FOREST TYPE MAP
Law Kyntang Diengkain
N
W
E
S
1 centimeter = 10 meters
0 10 20 40
Meters
Legend
SACRED GROVE BOUNDARY
FOREST TYPE
1B/C3 Cachar Tropical Evergreen Forest
Non Forest

3.1.6 Flora and Fauna

The *Law Kyntang Diengkain* is home to three storeyed moderately dense forest of natural origin. *Alphania lomura* species and *Hydnocarpus kurzii* are respectively 1st and 2nd dominant tree species. The forest is home to many rare, endangered and endemic plant species.



3.1.6.1: Floral species

Table 3.1.1: Trees found in *Law Kyntang Diengkain*

Sl. No.	Local Name	Botanical Name	Family
1.	*Dieng almari*	*Aphania lomura*	*Sapinolaceae*
2.	*Dieng sohphan*	*Artocarpus integrifolia*	*Moraceae*
3.	*Dieng sohkharoit*	*Aspidopterys nutans*	*Malpighiaceae*
4.	*Dieng sohkyntoi*	*Azadirechta indica*	*Meliaceae*
5.	*Dieng sohramdieng*	*Baccaurea ramiflora*	*Phyllanthaceae*
6.	*Dieng sohum saw*	*Cardia fragrantissina*	*Boraginaceae*
7.	*Dieng tlai*	*Caryota urens*	*Arecaceae*
8.	*Dieng siar*	*Castanopsis armata*	*Fabaceae*
9.	*Dieng stap*	*Castanopsis hystrix*	*Fagaceae*
10.	*Dieng latyrdop*	*Cinnamomum bejolghota*	*Lauraceae*
11.	*Dieng sohlyngem*	*Clousena excavata*	*Rutaceae*
12.	*Dieng sohriew*	*Coix lacrymajobi*	*Poaceae*
13.	*Dieng tyrsim maw*	*Debregeasia longifilia*	*Urticaceae*
14.	*Dieng sohthang*	*Diospyros melanoxylo*	*Ebenaceae*
15.	*Dieng sohlyngkait*	*Diospyros stricta*	*Ebenaceae*
16.	*Dieng brah*	*Drimycarpus racemosus*	*Anacardiaceae*
17.	*Dieng kyrbei*	*Dysoxylum hamiltonii*	*Meliaceae*
18.	*Dieng sohlyngksan*	*Elaeocarpus lancifolius*	*Elaeocarpaceae.*
19.	*Dieng lba*	*Engelhardtia spicata*	*Juglandaceae*

20.	*Dieng lamariong*	*Erioglossum edula*	*Sapindaceae*
21.	*Dieng sohum*	*Eugenia jambolana*	*Myrtaceae*
22.	*Dieng jri*	*Ficus spp*	*Moraceae*
23.	*Unknown*	*Galore edulis*	*Meliaceae*
24.	*Dieng sohkwang*	*Garcinia spicata*	*Clusiaceae*
25.	*Dieng sohum riphin*	*Glochidion sphaerogynum*	*Phyllanthaceae*
26.	*Dieng sohliang*	*Gynocardia odorata*	*Achariaceae*
27.	*Dieng sohsnam*	*Haematocarpus validus*	*Menispermaceae*
28.	*Dieng sohlap*	*Hydnocarpus kurzii*	*Achariaceae*
29.	*Dieng soh khawkrai*	*Ilex griffithii*	*Aquifoliaceae*
30.	*Dieng soh manir khlaw*	*Litsea laeta*	*Lauraceae*
31.	*Dieng tyllap*	*Macaranga spp*	*Euphorbiaceae*
32.	*Dieng lakhar*	*Macaranga denticulata*	*Euphorbiaceae*
33.	*Dieng sohniar*	*Michelia punduana*	*Magnoliaceae*
34.	*Dieng phaniaw*	*Michelia spp*	*Magnoliaceae*
35.	*Dieng sohliya*	*Myrica indica*	*Moraceae*
36.	*Dieng jarongsi*	*Pentapanax racemosus*	*Solaraceae*
37.	*Dieng sai*	*Quercus dealabata*	*Fagaceae*
38.	*Dieng kain*	*Rhus succedahnea*	*Anacardiaceae*
39.	*Dieng sohlwai*	*Syzygium aqueum*	*Myrtaceae*

Table 3.1.2: Shrubs found in *Law kyntang Diengkain*

Sl No.	Local Name	Botanical Name	Family
1.	*Dieng sohpaiat*	*Styrase serrulatum*	*Steracaceae*
2.	*Dieng shiah*	*Zanthoxhylum ovalifolia*	*Rutaceae*
3.	*Dieng jalengthem*	*Pauzolzia hirta*	*Urticaceae*
4.	*Dieng sohbrai khlaw*	*Drimycarpus racemosus*	*Racemosum*
5.	*Dieng sohmluh*	*Flacaurtia jangomas*	*Salicaceae*
6.	*Dieng tyrnew*	*Calamus erectus*	*Arecaceae*

Table 3.1.3: Herbs found in *Law Kyntang Diengkain*

Sl No.	Local Name	Botanical Name	Family
1.	*Latang*	*Stachyphyrnium placentarium*	Marantaceae
2.	*Tiew sying*	*Giniber purpeurum*	*Zingiberaceae*
3.	*Shylla*	*Caryota densiflora*	*Caryoteae*
4.	*Tyrkhang khlaw*	*Asplinia midus*	*Aspliniaceae*
5.	*Tyrkhang heh*	*Cyathea gigantea*	*Aspliniaceae*
6.	*Tiewkhawiang*	*Cutleya spicata*	*Zingiberaceae*
7.	*Tiewpat*	*Impatients glandulifera*	*Balsominaceae*

Table 3.1.4: Climbers found in *Law kyntang Diengkain*

Sl No.	Local Name	Botanical Name	Family
1.	*Mei ruin*	*Ampelocissus latifolia*	*Vitaceae*
2.	*Mei khlaw*	*Mucuna macrocarpa*	*Fabaceae*
3.	*Mei pur*	*Byrtneria aspera*	*Steculiaceae*
4.	*Pewshiah*	*Hedera nepalensis*	*Araliaceae*

Table 3.1.5: Orchids found in *Law Kyntang Diengkain*

Sl No.	Local Name	Botanical Name	Family
1.	*Dieng tiewmationg*	*Dendrobium chrysanthum,*	*Orchidaceae*
2.	*Tiew tlongkhnai*	*Oberonia mannii*	*Orchidaceae*
3.	*Knup mawiang*	*Paphiopedium insigne*	*Orchidaceae*

Table 3.1.6: Creepers found in *Law Kyntang Diengkain*

Sl No.	Local Name	Botanical Name	Family
1.	*Kynbat sohmynkea*	*Cardamine debilis*	*Cruciferae*
2.	*Sohned bah*	*Rubus rugosus*	*Rosaceae*
3.	*Jyrmi japan*	*Chromolaena odorata*	Asteraceae

3.1.6.2 Faunal Species

No scientific study to assess presence and abundance of wildlife in *Law Kyntang Diengkain* has been carried out so far. However, as per the local residents, presence of some wild animals such as jungle fowls, pangolin and numerous amphibians, reptile, and birds has been reported in this forest.

3.1.7 Growing Stock

As per the methodology described in Chapter-II, enumeration was carried out in 100% area of the forest as its area is less than 2 ha. All the trees, having girth (over bark) at breast height more than 30 cm, were enumerated by measuring the top height (in meters) and the girth at breast height (in centimetres). Data collected during the enumeration was entered in Sacred Groves Description Form and Plot Enumeration Form. During the enumeration, data were collected for 327 trees consisting of 70 *Alphania lomura* (1st dominant), 40 *Hydnocarpus kurzii* (2nd dominant), 31 *Pentapanax recemosus* (3rd dominant), and 184 rest of species. Using the Local Volume Equations given in Chapter –II, girth class wise volume was calculated for each species for each of the 13 girth classes starting from 30-40 cm to 151 cm and above. Details of the same are given in the Table 3.1.7 below. As may be seen, total growing stock in this forest is 297.03 cubic metres.

Table 3.1.7: Species wise distribution of growing stock in different girth classes

(cum)

Girth class (cm)	*Alphania lomura* (1st dominant)	*Hydnocarpus kurzii* (2nd dominant)	*Pentapanax racemosus* (3rd dominant)	Rest of species	Total growing stock	% of total growing stock
30-40	0.12	0.00	0.07	0.49	**0.68**	**0.23**
41-50	0.36	0.37	0.47	1.92	**3.12**	**1.05**
51-60	2.99	0.00	2.05	3.13	**8.17**	**2.75**
61-70	3.40	3.48	3.05	8.81	**18.74**	**6.31**
71-80	5.85	3.55	1.50	9.9	**20.80**	**7.00**
81-90	8.42	4.98	3.43	17.01	**33.84**	**11.39**
91-100	6.45	3.58	0.00	27.18	**37.21**	**12.53**
101-110	3.31	2.22	0.00	14.79	**20.32**	**6.84**
111-120	5.52	6.80	3.07	16.29	**31.68**	**10.67**
121-130	3.49	1.50	0.00	11.24	**16.23**	**5.46**
131-140	9.57	1.83	0.00	3.90	**15.30**	**5.15**
141-150	2.35	2.86	0.00	2.07	**7.28**	**2.45**
151 & above	11.54	0.00	0.00	72.12	**83.66**	**28.17**
Total	**63.37**	**31.17**	**13.64**	**188.85**	**297.03**	**100.00**
% of total growing stock	21.33	10.49	4.59	63.58	100.00	

As may be seen, 21.33%, the total growing stock is contributed by the 1st dominant species (*Alphania lomura)*. The 2nd dominant species (*Hydnocarpus kurzii*) constitutes 10.49% of the total growing stock. Similarly, the 3rd dominant species *(Pentapanax racemosus)* constitutes 4.59 % of the total growing stock. A major part of the growing stock (*i.e* 63.58 %) is constituted by the rest of the species.

Figure 3.1.1:Girth class-wise distribution of growing stock

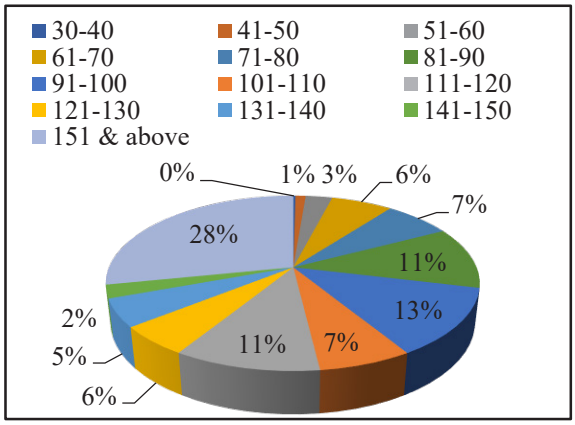


Figure 3.1.2: Species-wise distribution of growing stock

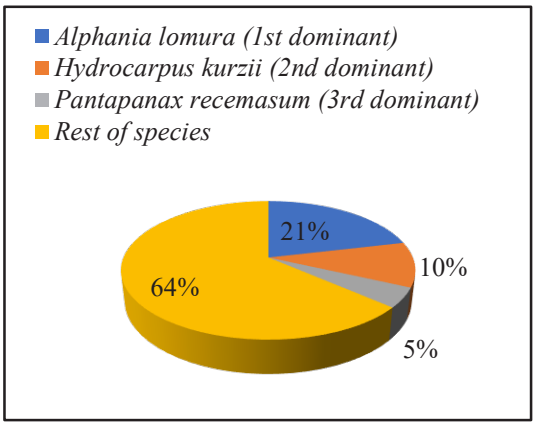


Figure 3.1.3:Girth class-wise distribution of growing stock

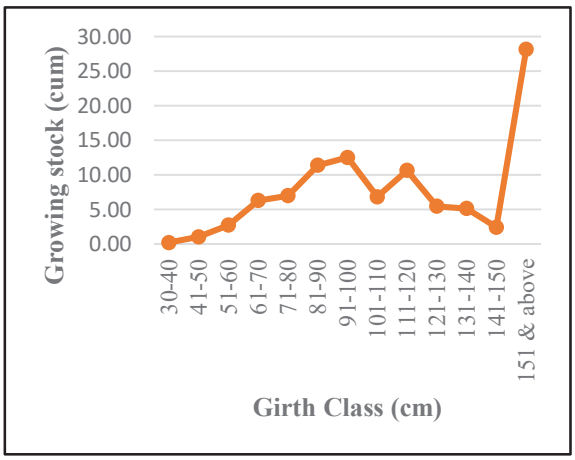


Figure 3.1.4: Overview of *Law Kyntang Diengkain*



3.1.8 Number of Stems

Species-wise number of stems in each girth class are given in Table 3.1.8 below. As may be seen maximum numbers of stems are found in middle girth classes *i.e.* from 61-70 cm to 81-90 cm.

Table 3.1.8: Species-wise distribution of stems in different girth classes in the entire forest

(numbers of stems)

Girth class (cm)	*Alphania lomura* (1st dominant)	*Hydnocarpus kurzii* (2nd dominant)	*Pentapanax racemosus* (3rd dominant)	Rest of the species	Total
30-40	2	0	2	12	**16**
41-50	3	3	3	14	**23**
51-60	11	0	8	13	**32**
61-70	9	9	8	23	**49**
71-80	11	7	3	19	**40**
81-90	12	7	5	24	**48**
91-100	7	4	0	30	**41**
101-110	3	2	0	13	**18**
111-120	4	5	2	12	**23**
121-130	2	1	0	7	**10**
131-140	5	1	0	2	**8**
141-150	1	1	0	1	**3**
151 & above	2	0	0	14	**16**
Total	**72**	**40**	**31**	**184**	**327**

Figure 3.1.5: Number of stems in different girth classes

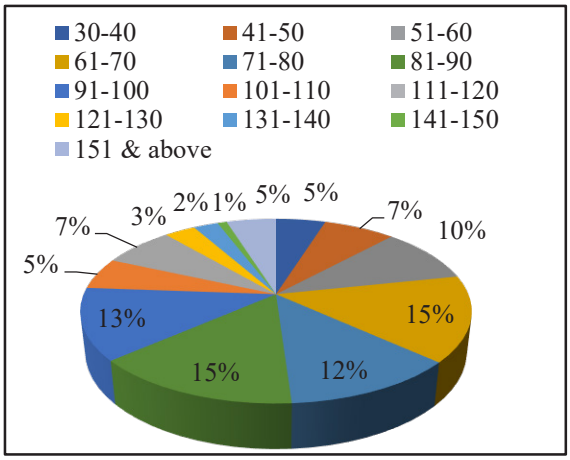


Figure 3.1.6: Species-wise distribution of stems

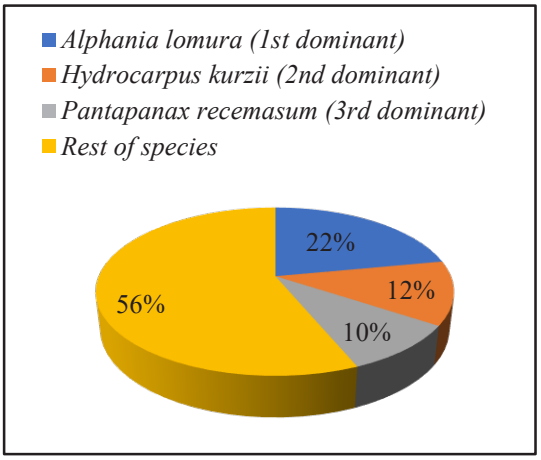


Figure 3.1.7:Number of stems in different girth classes

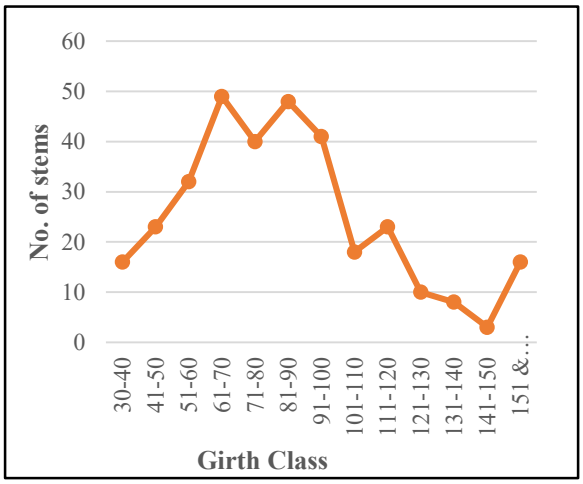


Figure 3.1.48: Inside view of *Law Kyntang Diengkain*



3.1.9 Prescriptions for Future Management

3.1.9.1 Registration with the Khasi Hills Autonomous District Council

The United Khasi-Jaintia Hills Autonomous District (Management and Control of Forests) Rules, 1960 provides for registration of each Law Adong located in areas falling under jurisdiction of the Khasi Hills Autonomous District Council (KHADC). Though these rules came into force about 65 years ago, the *Law Kyntang Diengkain* has not been registered with the KHADC. The Chief Forest Officer of the KHADC and the Village *Dorbar* of *Umwai* village may take immediate necessary actions, as provided in Chapter-I of the said rules to register the *Law Kyntang Diengkain* with the KHADC. The same will accord legal recognition and protection from diversion for non-forestry purposes.

3.1.9.2 Notification as Community Reserve

Section 38C of the Wild Life (Protection) Act, 1972 provides that the State Government may, where the community or an individual has volunteered to conserve wild life and its habitat, declare any private or community land not comprised within a National Park, Wildlife Sanctuary or a Conservation Reserve, as a Community Reserve, for protecting fauna, flora and traditional or cultural conservation values and practices. Notification of an area as a Community Reserve accords it legal protection. It also makes it eligible to receive financial assistance under a Centrally Sponsored Scheme of 'Integrated Development of Wildlife Habitats'. The *Dorbar* of *Umwai* village *and* Wildlife Wing in the Forest and Environment Department, Government of Meghalaya may therefore take necessary actions for notification of the *Law Kyntang Diengkain* as a Community Reserve.

3.1.9.3 Boundary Demarcation

Boundary of the *Law Kyntang Diengkain* has not been physically demarcated on the ground. Since, the grove is bounded by private land in all sides. to prevent and to ensure early detection of encroachment in all boundaries of *Law Kyntang Diengkain* wherever it is not constituted by natural

feature of permanent nature, such as river and stream, maybe demarcated by erection of RCC boundary pillars and painting of rings on stem of trees standing along the boundary.

3.1.9.4 Fire Protection

As per the Meghalaya Forest Fire Information System, during a period of 22 years (2002 - 2024) zero fire incident has occurred in the *Law Kyntang Diengkain.* As per the Meghalaya Forest Fire Information System developed by the North Eastern Space Application Centre (NESAC) a major part of the *Law Kyntang Diengkain* is moderately or highly vulnerable to forest fires. However, as per the said information system, a major part of *Law Kyntang Diengkain is* not prone to forest fire. To prevent damage to the *Law Kyntang Diengkain* from accidental forest fires, measures such as creation and periodic cleaning of fire line along the periphery and at critical locations within the *Law Kyntang Diengkain* and engagement of fire watchers during the critical months may be undertaken.

3.1.9.5 Construction of Soil Moisture Conservation and Water Harvesting Structures

Umsang Sabon stream flows through the *Law Kyntang Diengkain*. To prevent and minimise soil erosion and to improve moisture regime, construction of appropriate soil and moisture conservation structures such as check dam, contour trench, may be constructed at suitable locations in the *Law Kyntang Diengkain.*

3.1.9.6 Creation of Eco-Tourism Facilities

To create awareness about rich biodiversity of the *Law Kyntang Diengkain* and also to create livelihood opportunities for local residents, eco-tourism facilities such as rain shelter cum view point, footpath/ walking trail, sign board, washrooms *etc.* may be erected to attract tourists.

3.1.9.7 Restocking of Degraded Areas

Efforts may be made to restock the open degraded patches in *Law Kyntang Diengkain* by assisting and promoting natural regeneration of native species. Areas which cannot be naturally regenerated may be afforested by planting seedlings of native species.

3.1.9.8 Formulation of A Proposal and Registration Thereof on Carbon Registry to Earn Carbon Credits

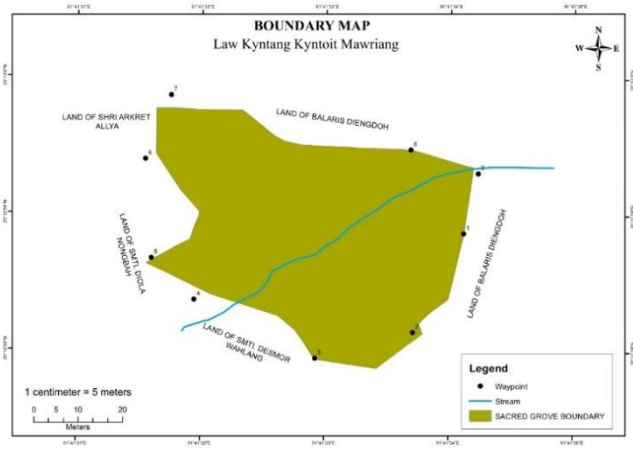
To reward the local communities for their efforts in conservation and protection of *Law Kyntang Diengkain* for centuries, a proposal may be formulated and registered on an appropriate carbon registry to earn carbon credits for measures to be taken by the local communities for better protection and conservation of the *Law Kyntang Diengkain*.

3.1.9.9 Awareness Campaign

The *Law Kyntang Diengkain* has been protected by the local communities for centuries for spiritual, environmental and cultural beliefs. With gradual relegation of these beliefs, local communities concern for conservation and protection of sacred groves and other community owned forests is gradually deteriorating. The same therefore need to be revived and strengthened by creating awareness program among the local communities and grassroot level institutions about cultural, heritage and economic importance of sacred groves and other community owned forests.

3.2. *LAW KYNTANG KYNTOIT MAWRIANG*

3.2.1 Location



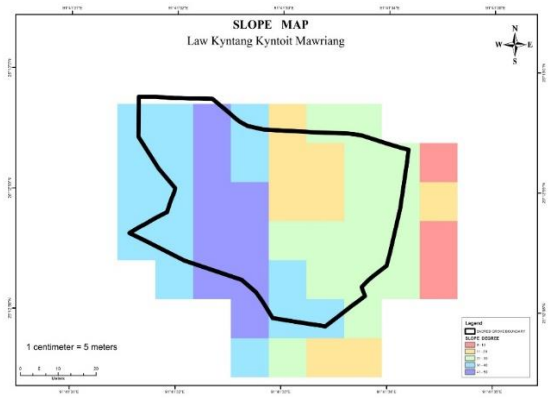
Law Kyntang Kyntoit Mawriang is situated in East Khasi Hills District of Meghalaya in *Mawlong* village under the *Mawlong* Sirdarship. It covers an area of 0.28 ha and lies between 25° 13′46" to 25° 13′ 50″ N latitude and 91° 41′ 52″ to 91° 41′ 56″ E longitude at an altitude of 430 m above mean sea level. It is bounded in the North and East by land of Smti Baloris Lyngdoh, West by land of Shri Arkret Allya and Smti Diora Nongbah and in the South by land of Smti Desmor Wahlang. The grove is accessible by road from Shillong which is about 74 km away.

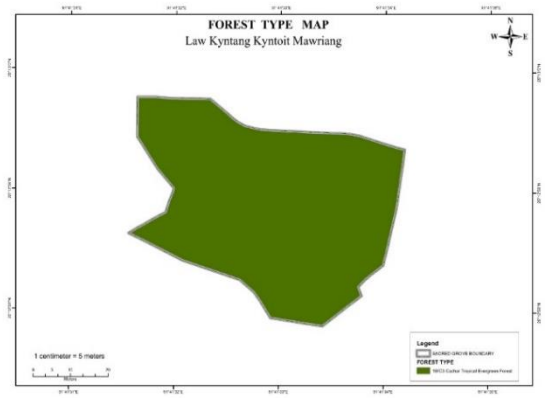
3.2.2 Brief History

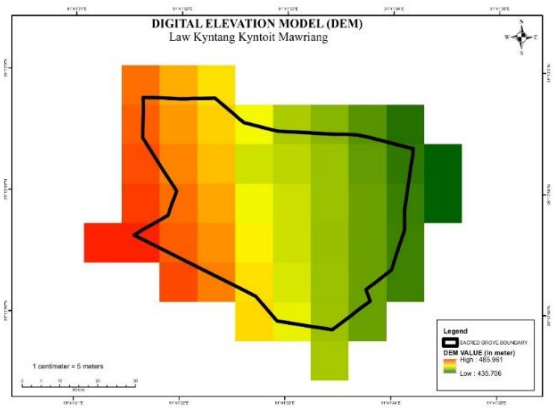
Law Kyntang Kyntoit Mawriang is in existence for several centuries. The grove is owned by the residents of *Kyntoit Mawriang* village. It is however managed and controlled by the *Lyngdoh*. Offerings and prayers are still performed every year by the *Lyngdoh*. Due to the spiritual significant, this grove is considered to house of various deities. Hence, the entry is strictly prohibited for the general public without the knowledge and prior permission of the *Lyngdoh.*

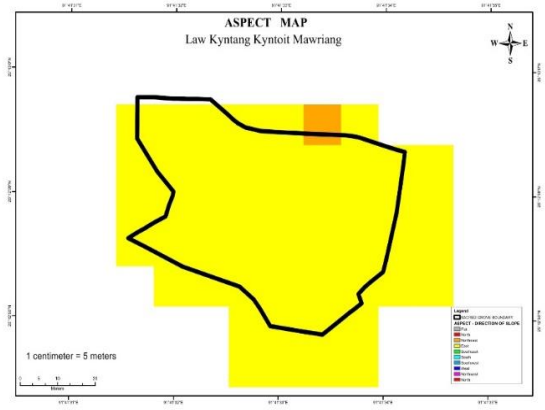


Offerings and prayers in this grove are performed by the *Lyngdoh*. Plucking of twigs or branches and up-rooting of any flora is strictly prohibited without prior permission from the *Lyngdoh*. Biotic pressures such as encroachments, hunting, poaching and illegal felling of trees are found to be absent in this forest.



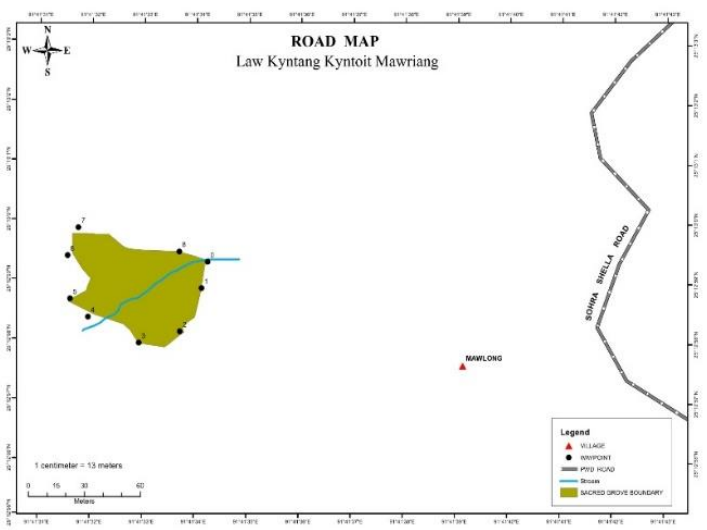






3.2.3 Geography and Climate

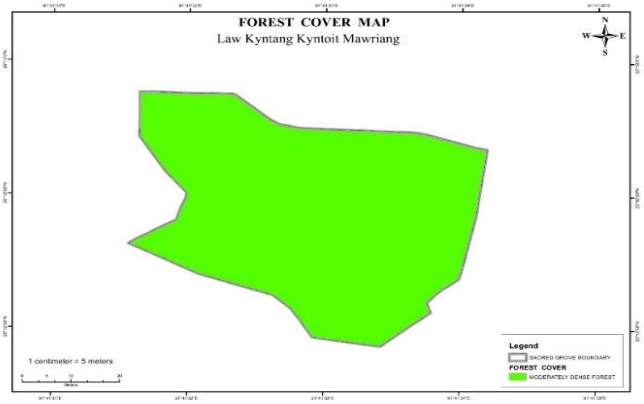
Topography of the grove is undulating in nature with slope varying from 0.2° to 40°. Major part of the *Law Kyntang Kyntoit Mawriang* falls under the eastern aspect. Small area in this forest falls under Western aspect. Soil texture is loamy with no coarse fragments. Soil consistency is slightly compact. Soil is black in colour and soil depth is shallow ranging from 15 cm to 30 cm. One perennial stream flow through this forest.



Winter season starts from end of October and lasts till March of the next year. It receives very high rainfall during the monsoon season from April to September.

3.2.4 Forest Type

As per the Champion and Seth classification (1968), forests found in the sacred grove are of the ***Type 1B/C3 Cachar Tropical Evergreen Forest.***



3.2.5 Forest Cover

As per the India State of Forest Report-2021 published by the Forest Survey of India, Dehradun, forest cover in the *Law Kyntang Kyntoit Mawriang* is as below:

Forest Cover	**Area (ha.)**	**% of total Area**
Very Dense Forest (> 70%)	0	0
Moderately Dense Forest (40 %-70 %)	0.28	100.0
Open Forest (10% - 40%)	0.00	0.00
Scrub Forest (<10%)	0	0
Non-Forest	0	0
Total	**0.28**	**100**

3.2.6 Flora and Fauna

The *Law Kyntang Kyntoit Mawriang* is home to a moderately dense forest of natural origin. *Symplocos chinensis* and *Michelia spp* are respectively 1st and 2nd dominant tree species. The forest is home to few rare, endangered and endemic plant species.

3.2.6.1. Floral species

Table 3.2.1: Trees found in *Law Kyntang Kyntoit Mawriang*

Sl No.	**Local Name**	**Botanical Name**	**Family**
1.	*Dieng sohphan*	*Artocarpus integrifolia*	*Moraceae*
2.	*Dieng sawramsong*	*Bergenia ciliate*	*Saxifragaceae*
3.	*Dieng latyrpad*	*Cinnamomum tamala*	*Lauraceae*
4.	*Dieng sohkyrngem*	*Clausena excavata*	*Rutaceae*
5.	*Dieng kyrbei*	*Dysoxylum hamiltonii*	*Meliaceae*
6.	*Dieng lamariong*	*Erioglossum edula*	*Sapindaceae*

7.	*Dieng sohum*	*Euginia jambolina*	*Myrtaceae*
8.	*Dieng sohryngiong*	*Eurya accuminata*	*Pentaphylacaceae*
9.	*Dieng lakhain*	*Ficus tinctoria*	*Moraceae*
10.	*Dieng phaniaw*	*Michelia spp*	*Magnoliaceae*
11.	*Dieng sohryndi*	*Moras laevigata*	*Moraceae*
12.	*Dieng iong*	*Symplocos chinensis*	*Symplocaceae*
13.	*Dieng shiah*	*Zanthoxylum ovalifolium*	*Rutaceae*

Table 3.2.2: Shrubs found in *Law Kyntang Kyntoit Mawriang*

Sl No.	Local Name	Botanical Name	Family
1.	*Jarem iong*	*Clerodendrum colebrookianum*	*Verbenaceae*
2.	*Synsar*	*Thysanolaena maxima*	*Poaceae*
3.	*Dieng sohrnong*	*Mahonia pycnophylla*	*Berberidaceae*
4.	*Soh lang*	*Viburnum foetidum*	*Caprifoliaceae*

Table 3.2.3: Herbs found in *Law Kyntang Kyntoit Mawriang*

Sl No.	Local Name	Botanical Name	Family
1.	*Tyrkhang*	*Asplenium nidus*	*Asplesiaceae*
2.	*Soh byrthit*	*Urena lobota*	*Malvaceae*
3.	*Wang khlaw*	*Esculenta spp.*	*Araceae*
4.	*Sla waitlam*	*Asplenium nidus*	*Aspliniaceae*
5.	*Sohtrunshiah*	*Ananus spp.*	*Bromiliaceae*
6.	*Phlang saw*	*Alpinia galanga*	*Zingiberaceae*
7.	*Phlang san*	*Kaempforia rotunda*	*Zingiberaceae*

Table 3.2.4: Climbers found in *Law Kyntang Kyntoit Mawriang*

Sl No.	Local Name	Botanical Name	Family
1.	*Jyrmikhlaw*	*Mucuna macrocarpa*	*Leguminaceae*
2.	*Sla kynda jyrmi*	*Pothos scandens*	*Araceae*
3.	*Soh shangkhlor*	*Elaeagnus pyriformis*	*Elaeagnaceae*
4.	*Pew shrieh*	*Hedera nepalensis*	*Araliaceae*
5.	*Jyrmi jasim*	*Maesa chisia*	*Premulaceae*
6.	*Jyrmi iwtung*	*Paederia scandens*	*Rubiaceae*

Table 3.2.5: Bamboos in *Law Kyntang Kyntoit Mawriang*

Sl No.	Local Name	Botanical Name	Family
1.	*Siej Skhen*	*Bambusa pallida*	*Poaceae*

Table 3.2.6: Grasses found in *Law Kyntang Kyntoit Mawriang*

Sl No.	Local Name	Botanical Name	Family
1.	*Phlang skei*	*Acarus calamus*	*Acoraceae*
2.	*Phlang*	*Salaria palmifolia*	*Poaceae*

3.2.6.2 Faunal Species

No scientific study to assess presence and abundance of wildlife in *Law Kyntang Kyntoit Mawriang* has been carried out so far. However, as per the local residents, presence of some wild animals including amphibians, reptile, bird and mammal has been reported in this forest.

3.2.7 Growing Stock

As per the methodology described in Chapter-II, enumeration was carried out in 100% area of the forest as its area is less than 2 ha. All the trees, having girth (over bark) at breast height more than 30 cm, were enumerated by measuring the top height (in meters) and the girth (in centimetres) at breast height. Data collected during the enumeration were entered in Sacred Grove Description Form and Plot Enumeration Form. During the enumeration data were collected for 58 trees consisting of 23 *Symplocos chinensis* (1st dominant), 11 *Michelia spp* (2nddominant), 5 *Clausena excavata* (3rd dominant), and 19 rest of species. Using the Local Volume Equations given in Chapter –II, girth class wise volume was calculated for each species for each of the 13 girth classes starting from 30-40 cm to 151 cm and above. Details of the same are given in the Table 3.2.9 below. As may be seen, total growing stock in this forest is 45.47 cubic metres.

Table 3.2.9: Species wise distribution of growing stock in different girth classes

(cum)

Girth class (cm)	*Symplocos chinensis* (1st dominant)	*Michelia spp* (2nd dominant)	*Clausena excavata* (3rd dominant)	Rest of species	Total growing stock	% of total growing stock
30-40	0.04	0.18	0.00	0.17	**0.39**	**0.86**
41-50	1.17	0.19	0.00	0.36	**1.72**	**3.78**
51-60	1.04	0.16	0.00	0.47	**1.67**	**3.67**
61-70	1.11	0.49	0.42	0.33	**2.35**	**5.17**
71-80	2.11	0.48	1.15	2.05	**5.79**	**12.73**
81-90	2.80	0.00	0.79	0.65	**4.24**	**9.32**

91-100	0.00	0.00	0.00	0.87	**0.87**	**1.91**
101-110	0.00	0.00	0.00	1.23	**1.23**	**2.71**
111-120	0.00	0.00	0.00	1.48	**1.48**	**3.25**
121-130	0.00	0.00	0.00	1.69	**1.69**	**3.72**
151 &	0.00	12.78	6.57	4.69	**24.04**	**52.87**
Total	**8.27**	**14.28**	**8.93**	**13.99**	**45.47**	**100.00**
% of total growing stock	18.19	31.41	19.64	30.77	100.00	

As may be seen, only 18.19% the total growing stock is contributed by the 1st dominant species (*Symplocos chinensis)* as it is a small size tree. The 2nd dominant species (*Michelia spp*) constitutes 31.41% of the total growing stock. Similarly, the 3rd dominant species *(Clausena excavata) constitutes* 19.64 % of the total growing stock. A major part of the growing stock (*i.e.* 30.77 %) is constituted by the rest of the species.

Figure 3.2.1:Girth class-wise distribution of growing stock

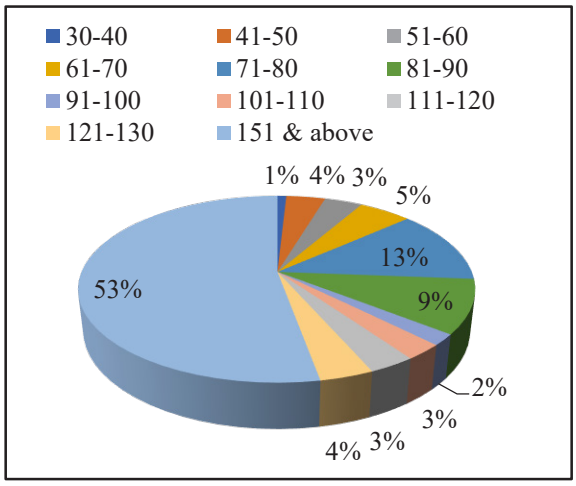


Figure 3.2.2: Species-wise distribution of growing stock

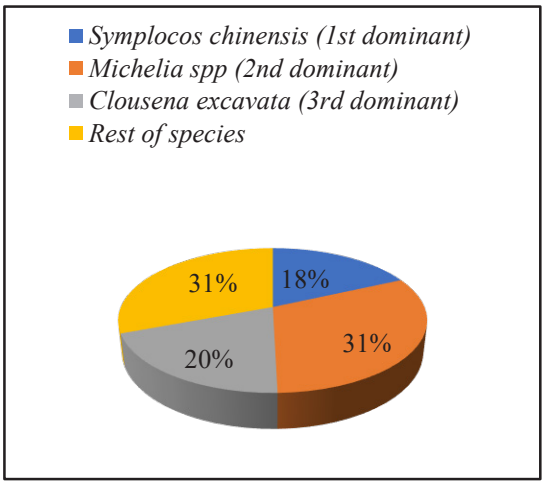


Figure 3.2.3:Girth class-wise distribution of growing stock

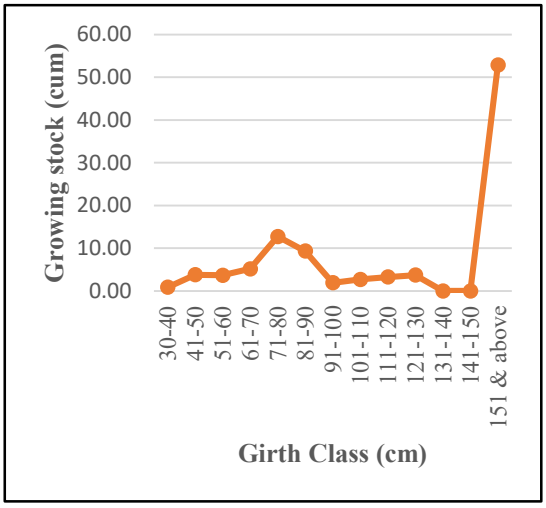


Figure 3.2.4: Overview of *Law Kyntang Kyntoit Mawriang*



3.2.8 Number of Stems

Species-wise number of stems in each girth class are given in Table 3.2.10 below. As may be seen maximum numbers of stems are found in lower girth classes *i.e.* from 30-40 cm to 81-90 cm as 1st dominant tree species is a small in size.

Table 3.2.10: Species-wise distribution of stems in different girth classes

(numbers of stems)

Girth class (cm)	*Symplocos chinensis* (1st dominant)	*Michelia spp* (2nd dominant)	*Clousena excavata* (3rd dominant)	Rest of the species	Total
30-40	1	3	0	4	**8**
41-50	7	2	0	2	**11**
51-60	4	1	0	2	**7**
61-70	3	2	1	1	**7**
71-80	4	1	2	4	**11**
81-90	4	0	1	1	**6**
91-100	0	0	0	1	**1**
101-110	0	0	0	1	**1**
111-120	0	0	0	1	**1**
121-130	0	0	0	1	**1**
131-140	0	0	0	0	**0**
141-150	0	0	0	0	**0**
151 & above	0	2	1	1	**4**
Total	**23**	**11**	**5**	**19**	**58**

Figure 3.2.5: Number of stems in different girth classes

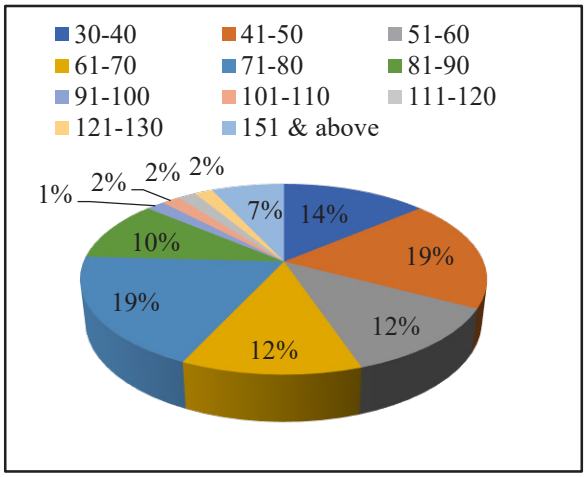


Figure 3.2.6: Species-wise distribution of stems

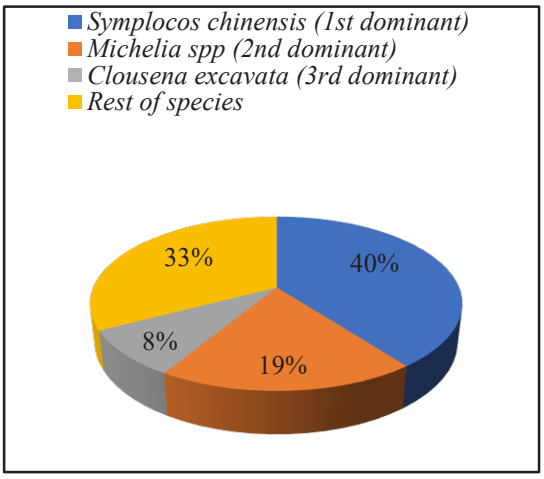


Figure 3.2.7:Number of stems in different girth classes



Figure 3.2.4: Inside view of *Law Kyntang Kyntoit Mawriang*



3.2.9 Prescriptions for Future Management

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Section 38C of the Wild Life (Protection) Act, 1972 provides that the State Government may, where the community or an individual has volunteered to conserve wild life and its habitat, declare any private or community land not comprised within a National Park, Wildlife Sanctuary or a Conservation Reserve, as a Community Reserve, for protecting fauna, flora and traditional or cultural conservation values and practices. Notification of an area as a Community Reserve accords it legal protection. It also makes it eligible to receive financial assistance under a Centrally Sponsored Scheme of 'Integrated Development of Wildlife Habitats'. The *Dorbar* of the *Mawlong* village *and* Wildlife Wing in the Forest and Environment Department, Government of Meghalaya may therefore take necessary actions for notification of the *Law Kyntang Kyntoit Mawriang* as a Community Reserve.

3.2.9.3 Boundary Demarcation

Boundary of the *Law Kyntang Kyntoit Mawriang* has not been physically demarcated on the ground. The same may result in intentional or unintentional encroachment. To prevent and to ensure early detection of encroachments, boundary of the *Law Kyntang Kyntoit Mawriang,* features of permanent naturefeatures of permanent nature may be demarcated by erection of RCC boundary pillars and painting of rings on stem of trees standing on the boundary.

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As per the Meghalaya Forest Fire Information System, during a period of 22 years (2002 - 2024) zero fire incident has occurred in the *Law Kyntang Kyntoit Mawriang.* As per the Meghalaya Forest Fire Information System developed by the North Eastern Space Application Centre (NESAC) a major part of the *Law Kyntang Kyntoit Mawriang* is moderately or highly vulnerable to forest fires. However, as per the said information system, a major part of *Law Kyntang Kyntoit Mawriang* is not prone to forest fire. To prevent damage to the *Law Kyntang Kyntoit Mawriang* from accidental forest fires, measures such as creation and periodic cleaning of fire line along the periphery and at critical locations within the *Law Kyntang Kyntoit Mawriang* and engagement of fire watchers during the critical months may be taken.

3.2.9.5 Construction of Soil Moisture Conservation and Water Harvesting Structures

One perrenial stream flows through the *Law Kyntang Kyntoit Mawriang.* To prevent and minimise soil erosion and to improve moisture regime appropriate soil and moisture conservation structures, such as check dam, contour trench, may be constructed in the *Law Kyntang Kyntoit Mawriang*, especially in the upper slope region.

3.2.9.6 Creation of Eco-Tourism Facilities

To create awareness about rich biodiversity of the *Law Kyntang Kyntoit Mawriang* and also to create livelihood opportunities for local residents, eco-tourism facilities such as rain shelter, footpath/ walking trail, sign board, washrooms *etc.* may be constructed to attract tourists.

3.2.9.7 Restocking of Degraded Areas

Efforts may be made to restock the degraded patches in *Law Kyntang Kyntoit Mawriang* by assisting and promoting natural regeneration of native species. Wherver required artificial regeneration by planting seedlings of native species should be undertaken.

3.2.9.8 Formulation of A Proposal and Registration Thereof on Carbon Registry to Earn Carbon Credits

To reward the local communities for their efforts in conservation and protection of *Law Kyntang Kyntoit Mawriang* for centuries, a proposal may be formulated and registered on an appropriate carbon registry to earn carbon credits for measures to be taken by the local communities for better protection and conservation of the *Law Kyntang Kyntoit Mawriang*.

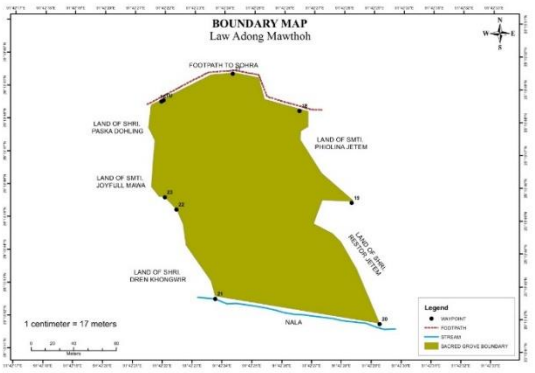
3.2.9.9 Awareness Campaign

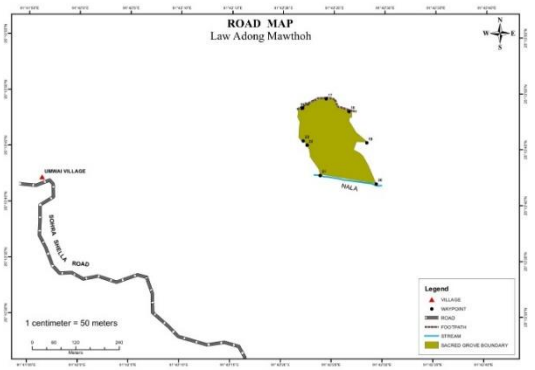
The *Law Kyntang Kyntoit Mawriang* has been protected by the local communities for centuries for spiritual, environmental and cultural beliefs. With gradual subordination of these beliefs, local communities concern for conservation and protection of sacred groves and other community owned forests is gradually declining. The same therefore need to be revived and strengthened by creating awareness among the local communities and grassroot level institutions about cultural, heritage and economic importance of sacred groves and other community owned forests.

3.3. *LAW ADONG MAWTHOH*

3.3.1 Location

Law Adong Mawthoh is situated in East Khasi Hills District of Meghalaya at *Umwai* village under *Mawlong* Sirdarship. It covers an area of 3.02 ha and lies between 25° 13′43" to 25° 13′ 49″ N latitude and 91° 42′ 22″ to 91° 42′ 29″ E longitude at an altitude of 564 m above mean sea level. It is bounded in the North by a footpath leading to *Sohra*, in the East by land of one Smti Phiolina Jetem and land of one Shri Restor Jetem, in West by the land of one Shri Paska Dohling, land of Smti Joyful Mawa and land of Shri Dwen Khongwir and in the South by a seasonal stream. The grove located at about 74 km from Shillong. It is accessible from the Shillong by an all weater





motorable road upto a point located at about 2 km from the forest from which one need to treck for about 2 km to reach the grove.

3.3.2 Brief History

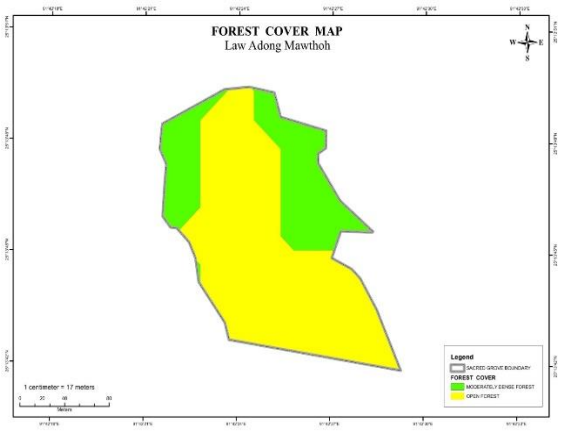


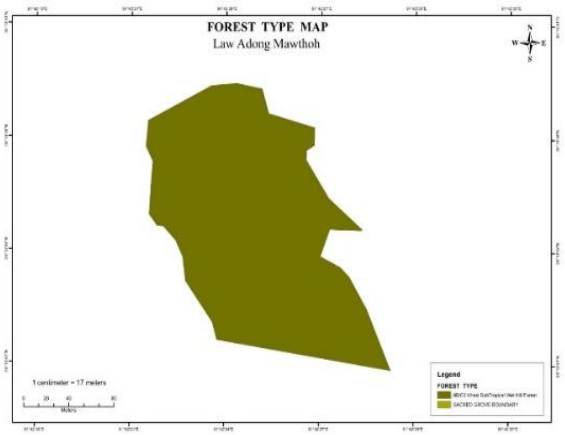
Law Adong Mawthoh is in existence for several centuries. Ritual and religious ceremonies are no longer performed in this grove as the local population has embraced Christianity. The local residents still preserve this relic forest for the environmental and ecological reasons. The *Law Adong Mawthoh* is managed by the village Headman and the ownership lies with the villagers. Entry inside this grove is not prohibited but felling of trees is strictly prohibited and punishable under the rules framed by the village *Dorbar*. Biotic pressures such as encroachments, hunting, poaching and illegal felling of trees area fround to be absent from this forest.

3.3.3 Geography and Climate

Topography of the grove is highly undulating in nature with slope varying from 0.3° to 57°. Major part of the *Law Adong Mawthoh* falls under the Southwest and western aspects with a small area in the Southeast aspect. Soil texture is sandy loam with no coarse fragments. Soil consistency is slightly compact. Soil is black in colour and soil depth is shallow ranging from 15 cm to 30 cm. One seasonal stream flow along the southern boundary.

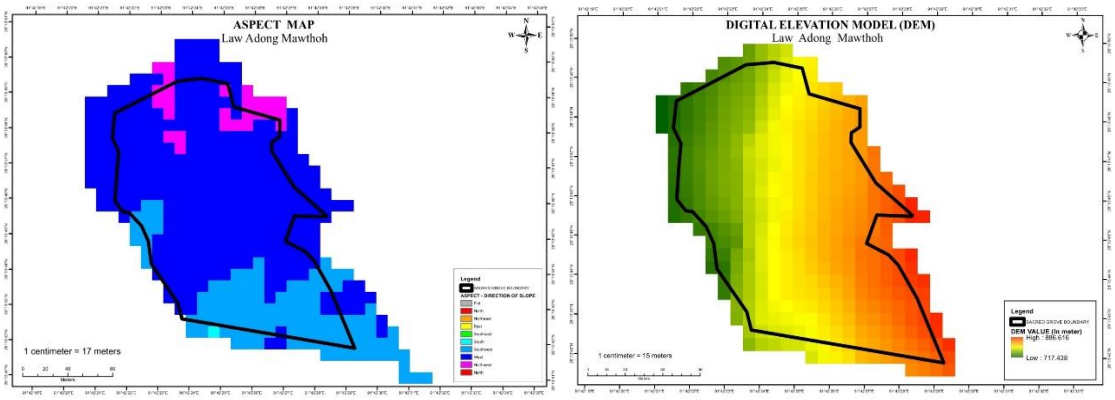
Winter season starts from end of October and lasts till March of the next year. It receives very high rainfall during the monsoon season.





3.3.4 Forest Type

As per the Champion and Seth classification (1968), forests found in the sacred grove are of the ***Type 8B/C2 Khasi Sub-Tropical Wet Hill Forest.***



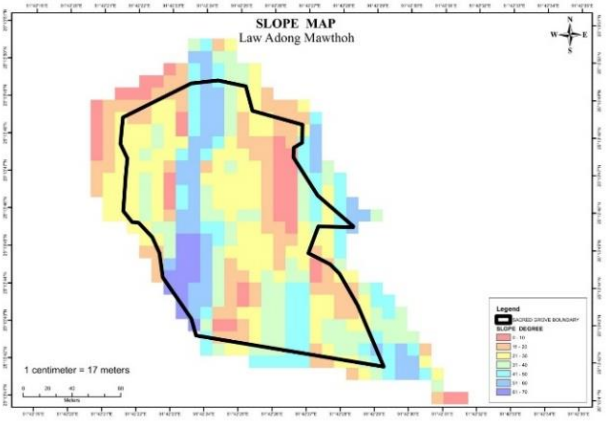
3.3.5 Forest Cover

As per the India State of Forest Report-2021 published by the Forest Survey of India, Dehradun, forest cover in the *Law Adong Mawthoh* is as below:

Forest Cover	**Area (ha.)**	**% of total Area**
Very Dense Forest (> 70%)	0	0
Moderately Dense Forest (40 %-70 %)	0.92	30.38
Open Forest (10% - 40%)	2.11	69.72
Scrub Forest (<10%)	0	0
Non-Forest	0	0
Total	**3.02**	**100**

3.3.6 Flora and Fauna

The *Law Adong Mawthoh* is home to moderately dense forest of natural origin. *Pentapanax racemosus* and *Caryota urens* are respectively 1st and 2nd dominant tree species. The forest is home to some rare, endangered and endemic plant species.



3.3.6.1: Floral species

Table 3.3.1: Trees found in *Law Adong Mawthoh*

Sl No.	Local Name	Botanical Name	Family
1.	*Dieng almari*	*Aphania lomura*	*Sapinolaceae*
2.	*Dieng sohkharoit*	*Aspidapterys nutans*	*Malpighiaceae*
3.	*Dieng sohtherlong*	*Bauhinia variegate*	*Fabaceae*
4.	*Dieng lapalam*	*Butea monosperma*	*Fabaceae*
5.	*Dieng sohumsaw*	*Cardia fragrantisssina*	*Boraginaceae*
6.	*Dieng tlai*	*Caryota urens*	*Arecaceae*
7.	*Dieng sohstap*	*Castanopsis spp*	*Fagaceae*
8.	*Dieng shangwaing*	*Cautleya spicata*	*Zingiberaceae*
9.	*Dieng phaniaw*	*Cepadoss fruicosa*	*Meliaceae*
10.	*Dieng jaremphew*	*Chloanthes parviflora*	*Lamiaceae*
11.	*Dieng latyrdop*	*Cinnamomum bejolghota*	*Lauraceae*
12.	*Dieng latyrpad*	*Cinnamomum tamala*	*Lauraceae*
13.	*Dieng sohkyrngem*	*Clausena excavate*	*Rutaceae*
14.	*Dieng iong*	*Diospyros kaki*	*Ebenaceae*
15.	*Dieng brah*	*Drimycarpus racemosus*	*Anacardiaceae*
16.	*Dieng lamariong*	*Ereoqlossum edula*	*Sapindaceae*
17.	*Dieng song*	*Erythrina indica*	*Fabaceae*
18.	*Dieng sohum*	*Eugenia jambolana*	*Myrtaceae*
19.	*Dieng sohrynkoh*	*Fagraea ceilanica*	*Gentianaceae*
20.	*Dieng jri*	*Ficus benjamina*	*Moraceae*
21.	*Dieng sohkhyllung*	*Garcinia pedunculata*	*Clusiaceae*
22.	*Dieng sohsnam*	*Haematocarpus validus*	*Menispermaceae*
23.	*Dieng skor khnai*	*Holmskioldia sanguinea*	*Lamiaceae*
24.	*Dieng sohsyrted*	*Itea chinensis*	*Iteaceae*
25.	*Dieng sohmanirkhlaw*	*Litsea laeta*	*Lauraceae*
26.	*Dieng lakhar*	*Macaranga denticulata*	*Euphorbiaceae*
27.	*Dieng sohkhyrwait*	*Machilus bambycina*	*Lauraceae*
28.	*Dieng stem*	*Marinda augustifolia*	*Rubiaceae*
29.	*Dieng sohsnait*	*Meliosma wallichii*	*Sabiaceae*
30.	*Dieng sohmon*	*Meyna laxiflora*	*Rubiaceae*
31.	*Dieng jarongsi*	*Pentapanax racemosus*	*Poaceae*
32.	*Dieng sohjadaw*	*Pierasma javanica*	*Simaroubaceae*
33.	*Dieng synsar*	*Pittosporum pedecarpum*	*Pittosporaceae*

34.	*Dieng klong*	*Pyrularia edulis*	*Santalaceae*
35.	*Dieng sohklapit*	*Sauropus androgynous*	*Phyllanthaceae*
36.	*Dieng ngan*	*Schima khasiana*	*Theaceae*
37.	*Dieng sohlangksan*	*Viburnum foetidum*	*Viburnaceae*
38.	*Dieng shadmoit*	*Wendlandia tinctoria*	*Rubiaceae*
39.	*Dieng sohshiah*	*Zanthoxylum ovaliafolium*	*Rutaceae*

Table 3.3.2: Shrubs found in *Law Adong Mawthoh*

Sl No.	Local Name	Botanical Name	Family
1.	*Dieng lakba*	*Polygata alata*	*Polygalaceae*
2.	*La jaremlieh*	*Clerodendrum viscosum*	*Verbenaceae*
3.	*Dieng sohpongkhlieh*	*Lantana camara*	*Verbenaceae*
4.	*Dieng shadmoit*	*Wendlandia wallichii*	*Rubiaceae*

Table 3.3.3: Herbs found in *Law Adong Mawthoh*

Sl No.	Local Name	Botanical Name	Family
1.	*Soh byrthit*	*Urina labata*	*Malvaceae*
2.	*Soh byrthit rit*	*Sida rhombifolia*	Chloranthaceae
3.	*Jalynthem*	*Polygonum chinense*	*Polygonaceae*
4.	*Tiew sharak*	*Gloriosa superba*	*Colchicaceae*
5.	*Tiew syieng*	*Gingirber purpeurium*	*Zingiberaceae*

Table 3.3.4: Climbers found in *Law Adong Mawthoh*

Sl No.	Local Name	Botanical Name	Family
1.	*Jermi siah sohkrot*	*Smilax glabra*	*Smilacaceae*
2.	*Jyrni pur*	*Byttneria aspera*	*Sterculiaceae*
3.	*Jermi japan*	*Ageratina adenophora*	*Asteraceae*
4.	*Jermi khlaw*	*Pisonia aculeate*	*Nyctaginaceae*
5.	*Jermi kharu*	*Cissampelos pareira*	*Menispermaceae*

Table 3.3.5: Grass found in *Law Adong Mawthoh*

Sl No.	Local Name	Botanical Name	Family
1.	*Phlang ot*	*Juncus effusus*	*Juncaceae*
2.	*Lang tylli*	*Arundinella khasiana*	*Poaceae*

3.	*Lang thyrnia*	*Arundinella pumila*	*Poaceae*
4.	*Latara*	*Dianthus chinensis*	*Caryophyllales*
5.	*Lakut*	*Plumbago zeylanica*	*Plumbaginaceae*

Table 3.3.6: Ferns found in *Law Adong Mawthoh*

Sl No.	Local Name	Botanical Name	Family
1.	*Tyrkhang khlaw*	*Asplenium nidus*	*Aspleniaceae*
2.	*Tyrkhang*	*Polypodium spp*	*Polypodiaceae*
3.	*Tyrkhang iong*	*Adiantum raddianum*	*Pteridaceae*
4.	*Tyrkhang maw*	*Cyathea gigantea*	*Cyatheaceae*
5.	*Tyrkhang snat*	*Cycas pectinata*	*Cycadaceae*

Table 3.3.7: Bamboos found in *Law Adong Mawthoh*

Sl No.	Local Name	Botanical Name	Family
1.	*Siej Shken*	*Bambusa nidus*	Poaceae
2.	*Siej skong*	*Bambusa tulda*	*Poaceae*
3.	*Seij iong*	*Chimonobambusa hookeriana*	*Poaceae*

3.3.6.2 Faunal Species

No scientific study to assess presence and abundance of wildlife in *Law Adong Mawthoh* has been carried out so far. However, as per the local residents, presence of some wild animals such as jungle fowls, pangolin and many amphibians, reptile, bird and mammal has been reported in this forest.

3.3.7 Growing Stock

As per the methodology described in Chapter-II, enumeration was carried out in 10 sample plots as its area is more than 2 ha. In each sample plots all the trees, having girth (over bark) at breast height more than 30 cm, were enumerated by measuring the top height (in meters) and the girth (in centimetres) at breast height. Data collected during the enumeration were entered in Sacred Groves Description Form and Plot Enumeration Form. During the enumeration within the grove, data were collected for 419 trees consisting of 54 *Pentapanax racemosus* (1st dominant), 30 *Caryota urens* (2nd dominant), 24 *Cinnamomum bejolghota* (3rd dominant), and 311 rest of species. Using the Local Volume Equations given in Chapter –II, girth class wise volume was calculated for each species for each of the 13 girth classes starting from 30-40 cm to 151 cm and above. Details of the same are given in the Table 3.3.9 and 3.3.10 below. As may be seen, total growing stock in this forest is 180.36 cubic metres.

Table 3.3.9: Species wise distribution of growing stock in different girth classes

(cum)

Girth Class (cm)	*Pentapanax racemosus* (1st dominant)	*Caryota urens* (2nd dominant)	*Cinnamomum bejolghota* (3rd dominant)	Rest of the species	Growing stock in 10 sample plots	Growing stock in entire Forest
30-40	0.57	0.00	0.15	1.51	**2.23**	3.37
41-50	0.91	0.92	0.15	2.44	**4.41**	6.66
51-60	1.15	0.67	0.28	5.62	**7.72**	11.65
61-70	2.06	0.71	0.87	5.47	**9.11**	13.76
71-80	1.07	1.05	0.00	6.77	**8.89**	13.43
81-90	0.95	0.94	0.23	6.87	**8.99**	13.58
91-100	1.26	0.55	0.00	7.36	**9.17**	13.85
101-110	0.71	2.28	0.52	4.26	**7.78**	11.75
111-120	1.85	1.21	0.00	6.85	**9.92**	14.98
121-130	0.00	0.00	0.00	2.20	**2.20**	3.32
131-140	0.00	0.00	0.00	1.21	**1.21**	1.83
141-150	0.00	1.37	0.00	0.00	**1.37**	2.07
151 & above	0.00	0.00	0.00	46.43	**46.43**	70.11
Total	**10.54**	**9.70**	**2.21**	**97.00**	**119.44**	180.36

Table 3.9.10: Species wise distribution of growing stock in different girth classes in the entire forest

(cum)

Girth Class (cm)	*Pentapanax racemosus* (1st dominant)	*Caryota urens* (2nd dominant)	*Cinnamomum bejolghota* (3rd dominant)	Rest of the species	Total	% of total growing stock
30-40	0.86	0.00	0.23	2.28	**3.37**	1.87
41-50	1.37	1.39	0.22	3.68	**6.66**	3.69
51-60	1.73	1.01	0.43	8.48	**11.65**	6.46
61-70	3.11	1.07	1.32	8.26	**13.76**	7.63
71-80	1.62	1.58	0.00	10.23	**13.43**	7.45
81-90	1.44	1.42	0.34	10.38	**13.58**	7.53
91-100	1.91	0.83	0.00	11.11	**13.85**	7.68
101-110	1.07	3.45	0.79	6.44	**11.75**	6.51
111-120	2.80	1.83	0.00	10.35	**14.98**	8.31
121-130	0.00	0.00	0.00	3.32	**3.32**	1.84

131-140	0.00	0.00	0.00	1.83	**1.83**	1.01
141-150	0.00	2.07	0.00	0.00	**2.07**	1.15
151 & above	0.00	0.00	0.00	70.11	**70.11**	38.87
Total	**15.91**	**14.65**	**3.33**	**146.47**	**180.36**	100.00
% of total growing stock	**8.82**	**8.12**	**1.85**	**81.21**	**100.00**	

As may be seen, 8.82%, the total growing stock is contributed by the 1st dominant species (*Pentapanax racemosus)*. The 2nd dominant species (*Caryota urens*) constitutes 8.12% of the total growing stock. Similarly, the 3rd dominant species *(Cinnamomum bejolghota)* constitutes 1.85 % of the total growing stock. A major part of the growing stock (*i.e.* 81.21%) is constituted by the rest of the species which indicates a greater diversity of tree species.

Figure 3.18.1:Girth class-wise distribution of growing stock

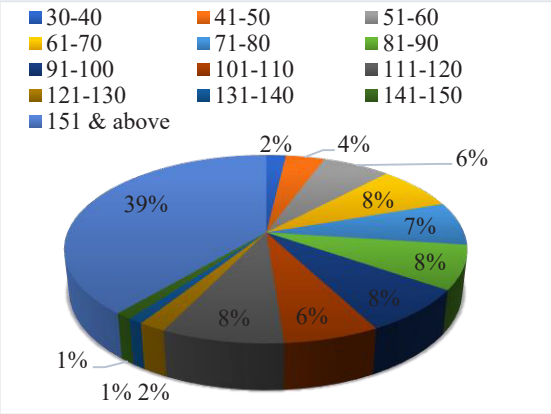


Figure 3.18.2: Species-wise distribution of growing stock

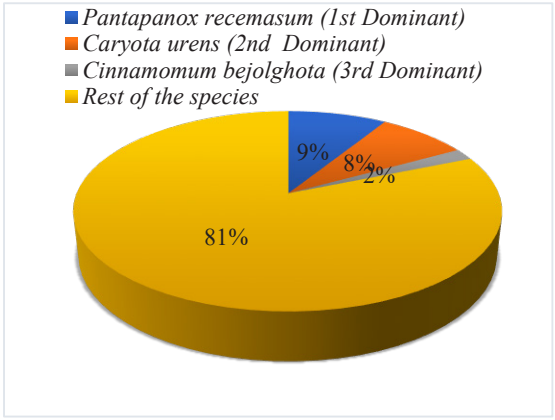


Figure 3.18.3: Girth class-wise distribution of growing stock

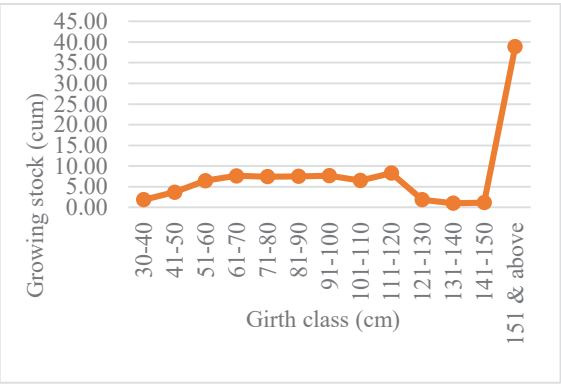


Figure 3.18.4: Inside view of *Law Adong Mawthoh*



3.3.8 Number of Stems

Species-wise number of stems in each girth class are given in Table 3.3.11 below. As may be seen maximum numbers of stems are found in lower girth classes *i.e.* from 30-40 cm to 71-80 cm. Number of stems are inversely proportional to mid-diameter of the girth class.

Table 3.3.11: Species-wise distribution of stems in different girth classes in the entire forest

(numbers of stems)

Girth Class (cm)	*Pentapanax racemosus* (1st dominant)	*Caryota urens* (2nd dominant)	*Cinnamomum bejolghota* (3rd dominant)	Rest of the species	Total
30-40	20	0	9	94	123
41-50	8	12	4	62	86
51-60	7	4	4	34	49
61-70	9	3	5	29	46
71-80	3	3	0	25	31
81-90	2	2	1	16	21
91-100	2	1	0	14	17
101-110	1	3	1	8	13
111-120	2	0	0	8	10
121-130	0	0	0	1	1
131-140	0	1	0	1	2
141-150	0	1	0	0	1
151 & above	0	0	0	19	19
Total	**54**	**30**	**24**	**311**	**419**

Figure 3.3.5:Number of stems in different girth classes

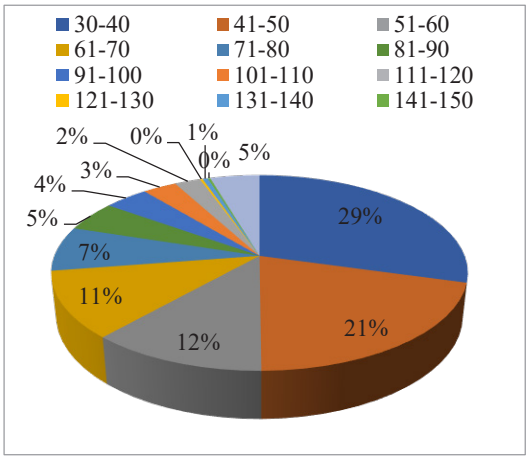


Figure 3.3.6: Species-wise distribution of stems

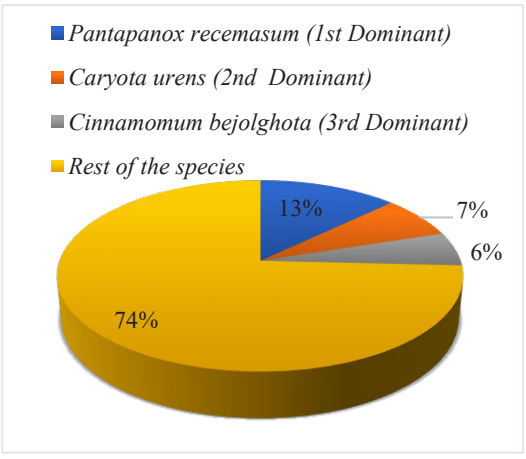


Figure 3.3.7:Number of Stems in different Girth Classes

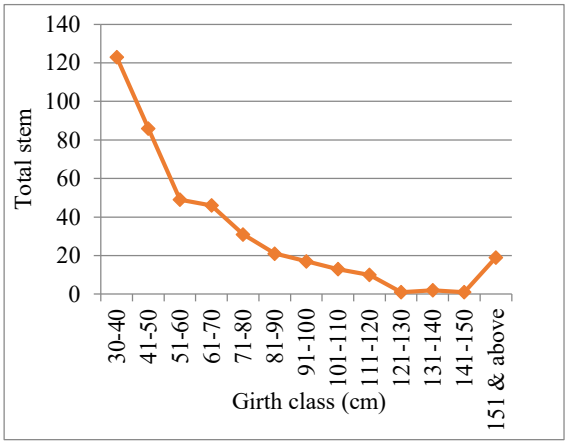


Figure 3.3.8:Overview of *Law Adong Mawthoh*



3.3.9 Prescriptions for Future Management

3.3.9.1 Registration with the Khasi Hills Autonomous District Council

The United Khasi-Jaintia Hills Autonomous District (Management and Control of Forests) Rules, 1960 provides for registration of each Law Adong located in areas falling under jurisdiction of the Khasi Hills Autonomous District Council (KHADC). Though these rules came into force about 65 years ago, the *Law Adong Mawthoh at Umwai* has not been registered with the KHADC. The Chief Forest Officer of the KHADC and the Village *Dorbar* of *Umwai* village may take immediate necessary actions, as provided in Chapter-I of the said rules to register the *Law Adong Mawthoh* with the KHADC. The same will accord legal recognition and protection from diversion for non-forestry purposes.

3.3.9.2 Notification as Community Reserve

Section 38C of the Wild Life (Protection) Act, 1972 provides that the State Government may, where the community or an individual has volunteered to conserve wild life and its habitat, declare any private or community land not comprised within a National Park, Wildlife Sanctuary or a Conservation Reserve, as a Community Reserve, for protecting fauna, flora and traditional or cultural conservation values and practices. Notification of an area as a Community Reserve accords it legal protection. It also makes it eligible to receive financial assistance under a Centrally Sponsored Scheme of 'Integrated Development of Wildlife Habitats'. The *Dorbar* of *Umwai village and* Wildlife Wing in the Forest and Environment Department, Government of Meghalaya may therefore take necessary actions for notification of the *Law Adong Mawthoh* as a Community Reserve.

3.3.9.3 Boundary Demarcation

Boundary of the *Law Adong Mawthoh* has not been physically demarcated on the ground. The grove is bounded in the North by footpath to *Sohra* and in the South, East and West by private land. To prevent and to ensure early detection of encroachment in all the boundaries of *Law Adong Mawthoh* where it is not constituted by the features of permanent nature, may be demarcated by erection of RCC boundary pillars and painting of rings on stem of trees standing along the boundary.

3.3.9.4 Fire Protection

As per the Meghalaya Forest Fire Information System, during a period of 22 years (2002 - 2024) zero fire incident has occurred in the *Law Adong Mawthoh.* As per the Meghalaya Forest Fire Information System developed by the North Eastern Space Application Centre (NESAC) a major part of the *Law Adong Mawthoh* is moderately or highly vulnerable to forest fires. However, as per the said information system, a major part of *Law Adong Mawthoh* at *Umwai* is not prone to forest fire. To prevent damage to the *Law Adong Mawthoh* from accidental forest fires, measures such as creation and periodic cleaning of fire line along the periphery and at critical locations within the *Law Adong Mawthoh* and engagement of fire watchers during the critical months may be taken.

3.3.9.5 Construction of Soil Moisture Conservation and Water Harvesting Structures

One seasonal stream flow along the southern boundary of *Law Adong Mawthoh*. To prevent and minimise soil erosion and to improve moisture regime, construction of appropriate soil and moisture conservation structures such as check dam, contour trench, may be constructed at suitable locations in the *Law Adong Mawthoh.*

3.3.9.6 Creation of Eco-Tourism Facilities

To create awareness about rich biodiversity of the *Law Adong Mawthoh* and also to create livelihood opportunities for local residents, eco-tourism facilities such as rain shelter cum view point, footpath/ walking trail, sign board, washrooms *etc.* may be built to attract tourists.

3.18.9.7 Restocking of Degraded Areas

Efforts may be made to restock the degraded patches in *Law Adong Mawthoh* by assisting and promoting natural regeneration of native species. Areas which cannot be restocked by natural regeneration alone, artificial regeneration by planting seedlings of native species should be undertaken.

3.3.9.8 Formulation of A Proposal and Registration Thereof on Carbon Registry to Earn Carbon Credits

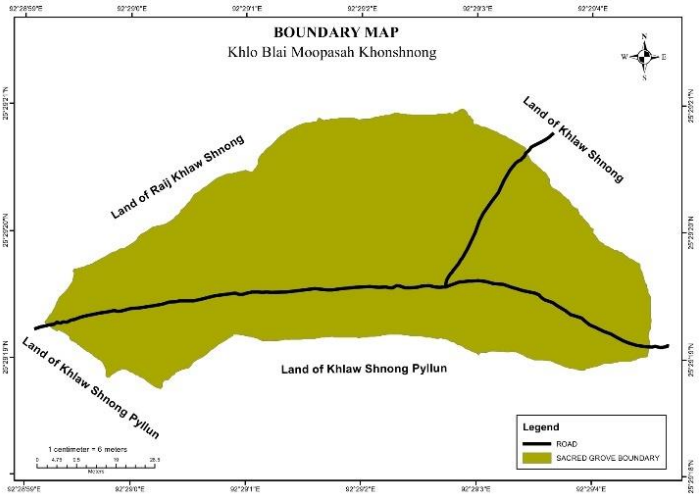
To reward the local communities for their efforts in conservation and protection of *Law Adong Mawthoh* for centuries, a proposal may be formulated and registered on an appropriate carbon registry to earn carbon credits for measures to be taken by the local communities for better protection and conservation of the *Law Adong Mawthoh*.

3.3.9.9 Awareness Campaign

The *Law Adong Mawthoh* has been protected by the local communities for centuries for spiritual, conservation and cultural beliefs. With gradual subordination of these beliefs, local communities concern for conservation and protection of sacred groves and other community owned forests is deteriorating. The same therefore need to be revived and strengthened by creating awareness among the local communities and grassroot level institutions about cultural, heritage and economic importance of sacred groves and other community owned forests.

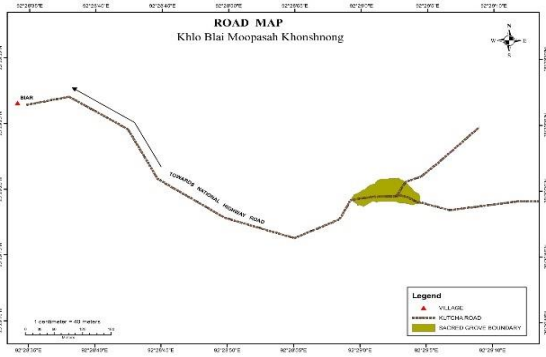
3.4. *KHLO BLAI MOOPASSAH*

3.4.1 Location



Khlo Blai Moopassah is situated in West Jaintia Hills District of Meghalaya at *Biar* village under *Elaka Raliang Doloiship*. It covers an area of 0.6 ha and lies between 25° 29′18" to 25° 29′ 21 N latitude and 92° 29′ 00″ to 92° 29′ 4″ E longitude at an altitude of 1,134 m above mean sea level. It is bounded in the North, East and North West by a *Khlaw Shnong* and in the South by a *Khlaw Shnong Pyllun*. The grove is accessible by road from Jowai to *Biar* village which is about 35 km away. The grove is under the lookout of the *Sein Raij*.



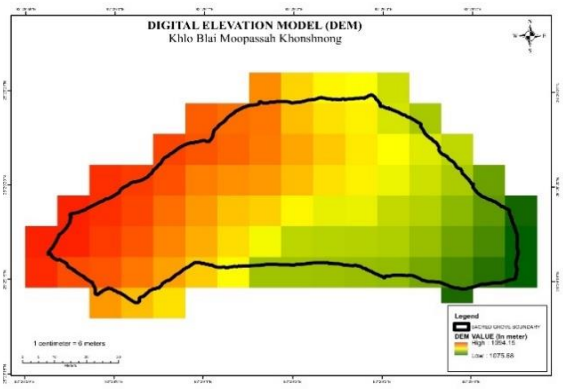


3.4.2 Brief History

Khlo Blai Moopassah is in existence for several centuries. Religious rituals are still performed every year by way of sacrificing poultry or livestock to gratify the *Basa* (Deiti) who, as per the traditional belief, in-turn bless and protect the Kingdom and its subject. Offering and prayer to deities are performed by the *Lyngdoh* of *Passah* clan. Entry to the grove is not prohibited but felling of trees is strictly prohibited. The grove is well known for its myriad of flora that adds to its beauty. Biotic pressures such as encroachments, hunting, poaching and illegal felling of trees are absent in this forest.

3.4.3 Geography and Climate

Topography of the grove is gentle rolling in nature which slope varying from 0.19° to 28°. Major part of the *Khlo Blai Moopassah* fall in the South-east and Southern aspects. Small area of this forest fall lies in the Eastern Aspect also. Soil texture is loamy with no coarse fragments. Soil consistency is slightly



compact. Soil is brown in colour and soil depth is shallow ranging from 15 cm to 30 cm. No sign of soil erosion has been observed in this grove.

Winter season starts from end of October and lasts till March of the next year. Rainfall varies from heavy to moderate.

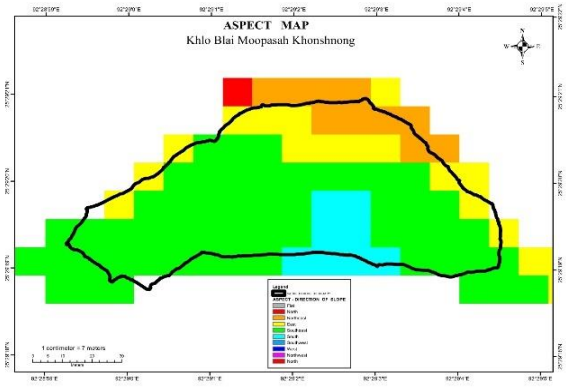
3.4.4 Forest Type

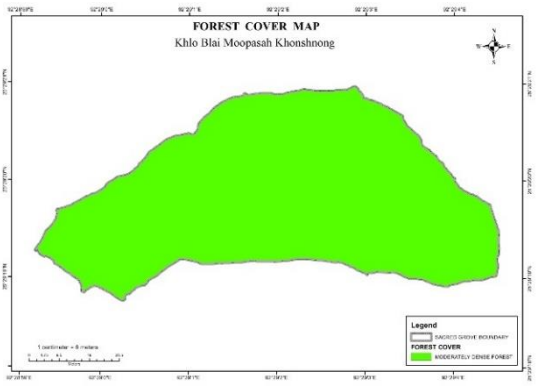
As per the Champion and Seth classification (1968), forests found in the sacred grove are of the ***Type 8B/C2 Khasi Sub Tropical Wet Hill Forest*** and ***Type Assam Sub Tropical Pine Forest.***

3.4.5 Forest Cover

As per the India State of Forest Report-2021 published by the Forest Survey of India, Dehradun, forest cover in the *Khlo Blai Moopassah* is as below:

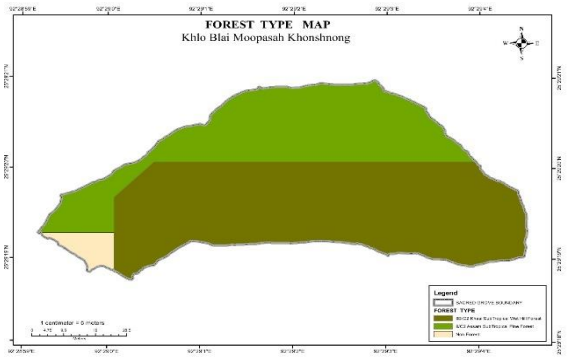
Forest Cover	**Area (ha.)**	**% of total Area**
Very Dense Forest (> 70%)		0
Moderately Dense Forest (40 %-70 %)	0.61	100
Open Forest (10% - 40%)	0	0
Scrub Forest (<10%)	0	0
Non-Forest	0	0
Total	**0.61**	**100**

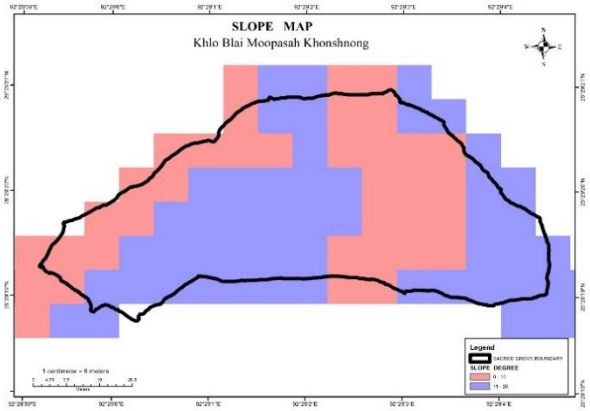




3.4.6 Flora and Fauna

The *Khlo Blai Moopassah* is home of moderately dense forest of natural origin. *Pasania fenestrata and Alstonia scholaris* are respectively 1st and 2nd dominant tree species. The forest is home to some rare, endangered and endemic plant species.





3.4.6.1: Floral species

Table 3.4.1: Trees found in *Khlo Blai Moopassah*

Sl. No.	Local Name	Botanical Name	Family
1.	*Dieng rteng*	*Alstonia scholaris*	*Apocynaceae*
2.	*Dieng somaru*	*Cassia fistula*	*Fabaceae*
3.	*Dieng lasaw*	*Eleocarpus robusta*	*Eleocarpaceae*
4.	*Dieng sohmylleng*	*Embelica officinalis*	*Phyllanthaceae.*
5.	*Dieng stem*	*Morinda augustifolia*	*Rubiaceae*
6.	*Dieng sohliya*	*Myrica nagi*	*Myricaceae*
7.	*Dieng sasei*	*Pasania fenestrata*	*Fagaceae*
8.	*Dieng kseh*	*Pinus kesiya*	*Pinaceae*
9.	*Dieng sohkynpit*	*Sauropus androgynus*	*Phyllanthaceae*
10.	*Dieng ngan*	*Schima khasiana*	*Theaceae*

Table 3.4.2: Shrubs found in *Khlo Blai Moopassah*

Sl No.	Local Name	Botanical Name	Family
1.	*Dieng tyrnem khynthei*	*Lagerstroemia*	*Lythraceae*
2.	*Dieng tyrnem*	*Camelia caudula*	*Fagaceae*
3.	*Dieng jalynsim*	*Debregeasia longifolia*	*Urticaceae*
4.	*Dieng soh pyrsit*	*Eurya acuminata*	*Theaceae*
5.	*Slajarem iong*	*Clerodendrum colebrookianum*	*Verbenaceae*

Table 3.4.3: Herbs found in *Khlo Blai Moopassah*

Sl No.	Local Name	Botanical Name	Family
1.	Synrai khlaw	*Alpinia spp.*	Gingiberaceae
2.	*Syieng khlaw*	*Zengiber purpureum*	*Zingiberaceae*
3.	*Phud wang*	*Colocasia spp.*	Araceae
4.	*Wang khlaw*	*Esculenta spp.*	Araceae
5.	*Bat eroplain*	*Inula cappa*	*Asteraceae*
6.	*Jajew khlaw*	*Begonia roxburghii*	*Begoniaceae*

Table 3.4.4: Climbers found in *Khlo Blai Moopassah*

Sl No.	Local Name	Botanical Name	Family
1.	*Jermi siah sohkrot*	*Smilax glabra*	*Smilacaceae*
2.	*Jermi ruin*	*Derris elliptica*	*Fabaceae*
3.	*Jermi pew shrieh*	*Hedera nepalensis*	*Araliaceae*
4.	*Jermi Siah nepbah*	*Ampelocissus latifolia*	*Vitaceae*
5.	*Jyrni pur*	*Cocculus hirsutus*	*Menispermaceae*

Table 3.4.5: Grasses found in *Khlo Blai Moopassah*

Sl No.	Local Name	Botanical Name	Family
1.	*Phlang tylli*	*Arundinella khasiana*	*Poaceae*
2.	*Phlang thyrnia*	*Arundinella pumila*	*Poaceae*
3.	*Phlang ot*	*Juncus effusus*	*Juncaceae*
4.	*Synsar*	*Thysanolaena maxima*	*Poaceae*

Table 3.4.6: Ferns found in *Khlo Blai Moopassah*

Sl No.	Local Name	Botanical Name	Family
1.	*Tyrkhang iong*	*Adiantum raddianum*	*Pteridaceae*
2.	*Tyrkhang khlaw*	*Asplenium nidus*	*Aspleniaceae*
3.	*Tyrkhang maw*	*Cyathea gigantea*	*Cyatheaceae*

Table 3.4.7: Bamboos found in *Khlo Blai Moopassah*

Sl No.	Local Name	Botanical Name	Family
1.	*Siej Shken*	*Bambusa nidus*	*Poaceae*
2.	*Siej skong*	*Bambusa tulda*	*Poaceae*

3.4.6.2 Faunal Species

No scientific study to assess presence and abundance of wildlife in *Khlo Blai Moopassah* has been carried out so far. However, as per the local residents, presence of some wild animals has been reported in this forest.

3.4.7 Growing Stock

As per the methodology described in Chapter-II, enumeration was carried out in 100% area of the forest as its area is less than 2 ha. All the trees, having girth (over bark) at breast height more than 30 cm, were enumerated by measuring the top height (in meters) and the girth (in centimetres) at breast height. Data collected during the enumeration were entered in Sacred Groves Description Form and Plot Enumeration Form. During the enumeration within the grove, data were collected for 156 trees consisting of 57 *Pasania fenestrata* (1st dominant), 34 *Alstonia scholaris* (2nddominant), 27 *Schima khasiana (*3rd dominant), and 38 rest of species. Using the Local Volume Equations given in Chapter –II, girth class wise volume was calculated for each species for each of the 13 girth classes starting from 30-40 cm to 151 cm and above. Details of the same are given in the Table 3.18.9 below. As may be seen, total growing stock in this forest is 52.43 cubic metres.

Table 3.4.9: Species wise distribution of growing stock in different girth classes in the entire forest

(cum)

Girth Class (cm)	*Pasania fenestrata* (1stdominant)	*Alstonia scholaris* (2nddominant)	*Schima khasiana* (3rddominant)	Rest of the species	Total	% of total growing stock
30-40	0.84	0.22	0.42	0.90	**2.38**	4.54
41-50	4.11	0.98	0.46	1.20	**6.75**	12.87
51-60	2.47	2.10	0.98	0.22	**5.77**	11.01
61-70	2.18	2.04	1.43	1.14	**6.79**	12.95
71-80	0.00	2.13	0.56	1.09	**3.78**	7.21
81-90	0.00	0.72	2.16	2.12	**5.00**	9.54
91-100	0.00	1.81	1.69	2.79	**6.29**	12.00
101-110	0.00	1.09	0.00	2.20	**3.29**	6.28
111-120	0.00	0.00	0.00	1.27	**1.27**	2.42
121-130	0.00	1.66	1.53	0.00	**3.19**	6.08
131-140	0.00	0.00	0.00	0.00	**0.00**	0.00

141-150	0.00	0.00	0.00	0.00	**0.00**	0.00
151 & above	0.00	7.92	0.00	0.00	**7.92**	15.11
Total	**9.60**	**20.67**	**9.23**	**12.93**	**52.43**	100.00
% of total growing stock	**18.31**	**39.42**	**17.60**	**24.66**	**100.00**	

As may be seen, only 18.31%, the total growing stock is contributed by the 1st dominant species (*Pasania fenestrata)* as this is a small-sized tree. The 2nd dominant species (*Alstonia scholaris*) constitutes 39.42% of the total growing stock. Similarly, the 3rd dominant species *(Schima khasiana)* constitutes 17.60 % of the total growing stock. The remaining part of the growing stock (*i.e.* 24.66 %) is constituted by the rest of the species.

Figure 3.18.1:Girth class-wise distribution of growing stock

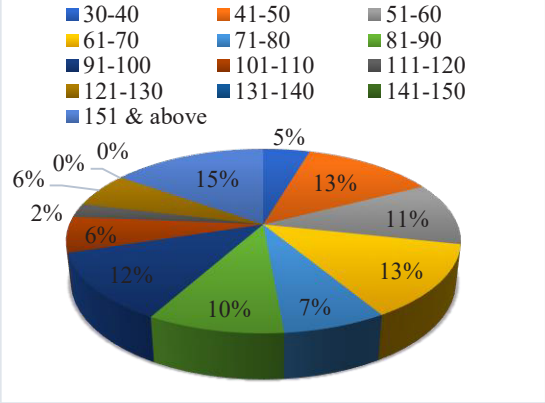


Figure 3.18.2: Species-wise distribution of growing stock

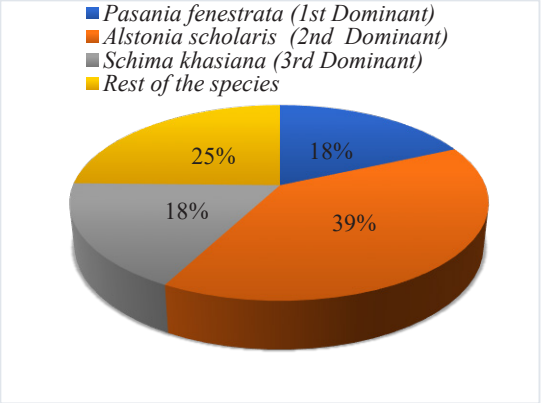


Figure 3.4.3:Girth class-wise distribution of growing stock



Figure 3.4.4: Inside view of *Khlo Blai Moopassah*



3.4.8 Number of Stems

Species-wise number of stems in each girth class are given in Table 3.4.10 below. As may be seen maximum numbers of stems are found in lower girth classes *i.e.* from 30-40 cm to 71-80 cm. Number of stems are more or less inversely proportional to mid-diameter of the girth class.

Table 3.4.10: Species-wise distribution of stems in different girth classes in the entire forest

(numbers of stems)

Girth Class (cm)	*Pasania fenestrata* (1st dominant)	*Alstonia scholaris* (2nd dominant)	*Schima khasiana* (3rd dominant)	Rest of the species	Total
30-40	14	4	9	15	42
41-50	27	7	3	8	45
51-60	10	8	4	1	23
61-70	6	5	4	3	18
71-80	0	4	1	2	7
81-90	0	1	3	3	7
91-100	0	2	2	3	7
101-110	0	1	0	2	3
111-120	0	0	0	1	1
121-130	0	1	1	0	2
131-140	0	0	0	0	0
141-150	0	0	0	0	0
151 & above	0	1	0	0	1
Total	**57**	**34**	**27**	**38**	**156**

Figure 3.4.5: Number of stems in different girth classes

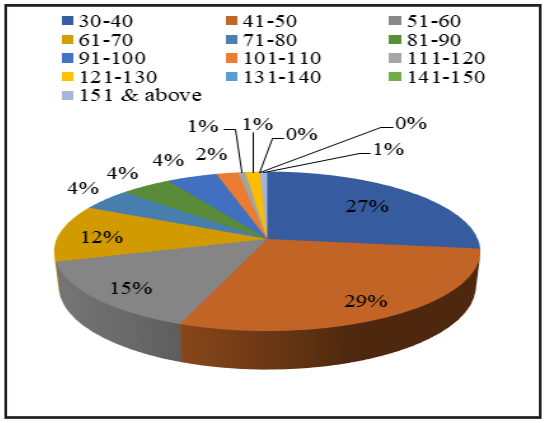


Figure 3.4.6: Species-wise distribution stems

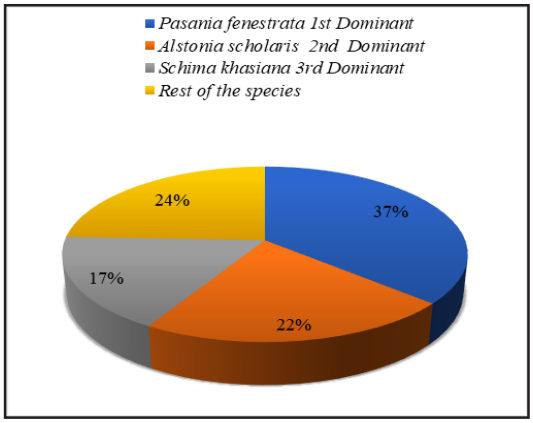


Figure 3.4.7:Number of stems in different girth classes

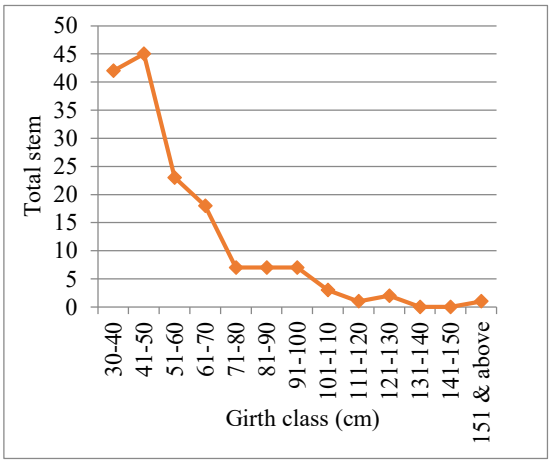


Figure 3.4.4: Overview of *Khlo Blai Moopassah*



3.4.9 Prescriptions for Future Management

3.4.9.1 Registration with the Jaintia Hills Autonomous District Council

The United Khasi-Jaintia Hills Autonomous District (Management and Control of Forests) Rules, 1960 provides for registration of sacred groves located in areas falling under jurisdiction of the Jaintia Hills Autonomous District Council (JHADC). Though these rules came into force about 65 years ago, the *Khlo Blai Moopassah* has not been registered with the JHADC. The Chief Forest Officer of the JHADC and the *Sein Raij* of *Khlo Blai Moopassah* may take immediate necessary actions, as provided in Chapter-I of the said rules to register the *Khlo Blai Moopassah* with the JHADC. The same will accord legal recognition and protection from diversion for non-forestry purposes.

3.4.9.2 Notification as Community Reserve

Section 38C of the Wild Life (Protection) Act, 1972 provides that the State Government may, where the community or an individual has volunteered to conserve wild life and its habitat, declare any private or community land not comprised within a National Park, Wildlife Sanctuary or a Conservation Reserve, as a Community Reserve, for protecting fauna, flora and traditional or cultural conservation values and practices. Notification of an area as a Community Reserve accords it legal protection. It also makes it eligible to receive financial assistance under a Centrally Sponsored Scheme of 'Integrated Development of Wildlife Habitats'. The *Sein Raij* of *Khlo Blai Moopassah* and Wildlife Wing in the Forest and Environment Department, Government of Meghalaya may therefore take necessary actions for notification of the *Khlo Blai Moopassah* as a Community Reserve.

3.4.9.3 Boundary Demarcation

Boundary of the *Khlo Blai Moopassah* has not been physically demarcated on the ground. The same may result in intentional or unintentional encroachment. To prevent and to ensure early detection of encroachments, boundary of the *Khlo Blai Moopassah*, wherever it is not constituted by

features of permanent naturefeatures of permanent nature may be demarcated by erection of RCC boundary pillars and painting of rings on stem of trees standing on the boundary.

3.4.9.4 Fire Protection

As per the Meghalaya Forest Fire Information System, during a period of 22 years (2002 - 2024) zero fire incident has occurred in the *Khlo Blai Moopassah*. As per the Meghalaya Forest Fire Information System developed by the North Eastern Space Application Centre (NESAC) a major part of the *Khlo Blai Moopassah* is moderately or highly vulnerable to forest fires. However, as per the said information system, a major part of *Khlo Blai Moopassah* is not prone to forest fire. To prevent damage to the *Khlo Blai Moopassah* from accidental forest fires, measures such as creation and periodic cleaning of fire line along the periphery and at critical locations within the *Khlo Blai Moopassah* and engagement of fire watchers during the critical months may be taken.

3.4.9.5 Construction of Soil Moisture Conservation and Water Harvesting Structures

No stream flows through *Khlo Blai Moopassah*. To prevent and minimise soil erosion and to improve moisture regime, water harvesting structures such as check dam, contour trench, may be constructed at suitable locations in the *Khlo Blai Moopassah.*

3.4.9.6 Creation of Eco-Tourism Facilities

To create awareness about rich biodiversity of the *Khlo Blai Moopassah* and also to create livelihood opportunities for local residents, eco-tourism facilities such as rain shelter cum view point, footpath, walking trail, sign board, washrooms *etc.* may be constructed to attract tourists.

3.4.9.7 Restocking of Degraded Areas

Efforts may be made to restock the degraded patches in *Khlo Blai Moopassah* by assisting and promoting natural regeneration of native species. In areas where natural regeneration is not feasible, artificial regeneration by planting seedlings of native species should be undertaken.

3.4.9.8 Formulation of A Proposal and Registration Thereof on Carbon Registry to Earn Carbon Credits

To reward the local communities for their efforts in conservation and protection of *Khlo Blai Moopassah* for centuries, a proposal may be formulated and registered on an appropriate carbon registry to earn carbon credits for measures to be taken by the local communities for better protection and conservation of the *Khlo Blai Moopassah*.

3.4.9.9 Awareness Campaign

The *Khlo Blai Moopassah has* been protected by the local communities for centuries for spiritual, conservation and cultural beliefs. With gradual subordination of these beliefs, concern of the local communities for conservation and protection of sacred groves and other community owned forests is gradually declining. The same therefore need to be revived and strengthened by creating awareness among the local communities and grassroot level institutions about cultural, heritage and economic importance of sacred groves and other community owned forests.

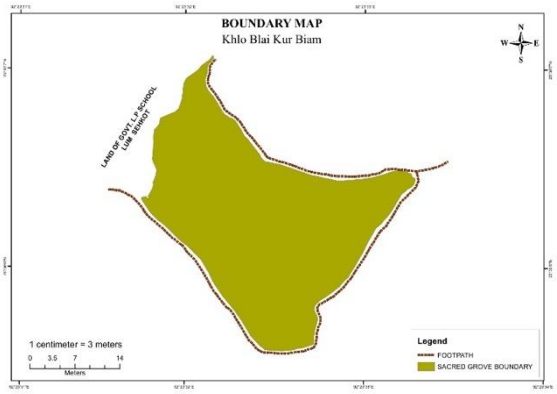
3.5. *KHLO BLAI KUR BIAM*

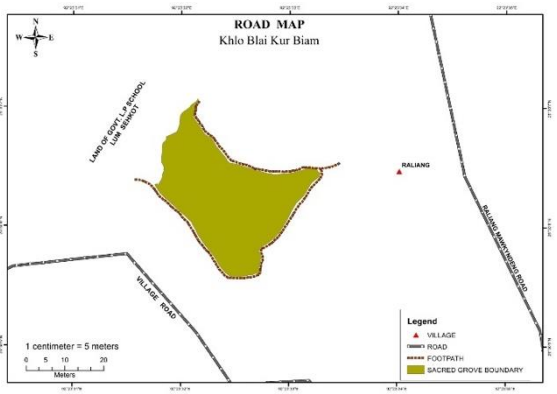
3.5.1 Location



Khlo Blai Kur Biam is situated in West Jaintia Hills District of Meghalaya at *Raliang* village under *Elaka Raliang Dolloiship*. It covers an area of 0.08 ha and lies between 25° 30. 4" to 25° 30′ 7 N latitude and 92° 23′ 30″ to 92° 23′ 34″ E longitude at an altitude of 1326 m above mean sea level. It is bounded in the North, East and South West by internal road and in the North West by Government Lower Primary School, *Lumsehkot*, *Raliang*. The grove is accessible by *Jowai* - *Raliang* Road. It is located at 26 km from the Jowai. The grove is managed and administred by the local tribal residents belonging to *Biam* Clan.

3.5.2 Brief History

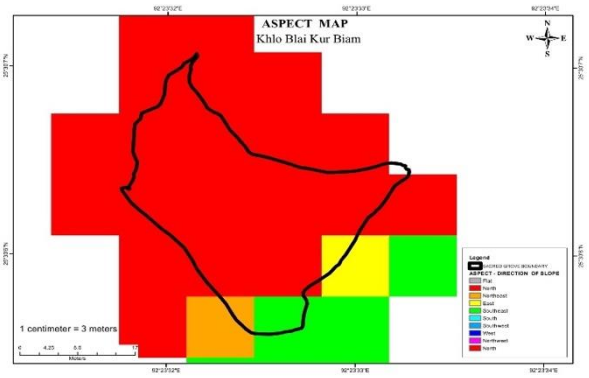




Khlo Blai Kur Biam is in existence for several centuries. Religious rituals are still performed in this grove till date by way of sacrificing poultry and livestock; to please the *Basa* (Deiti) who in-turn bless and protect the Kingdom and its subject. Offering and prayer to deities are made by the *Lyngdoh* of *Biam* Clan. Beside religious significance, the grove is well known for its myriad of flora which adds to its natural beauty. Felling of trees, hunting, poaching, grazing and and even entry into the grove is strictly prohibited.

Biotic pressures such as encroachments, hunting, poaching and illegal felling of trees are found to be absent in this forest.

3.5.3 Geography and Climate

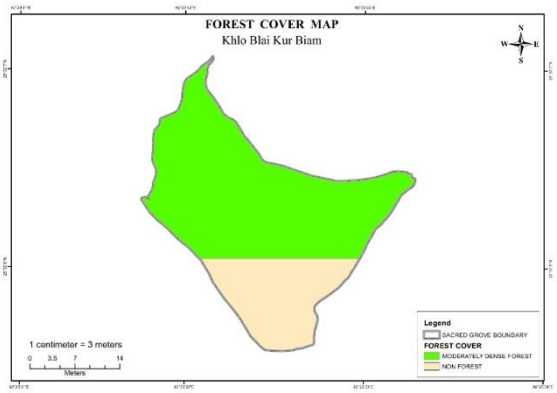


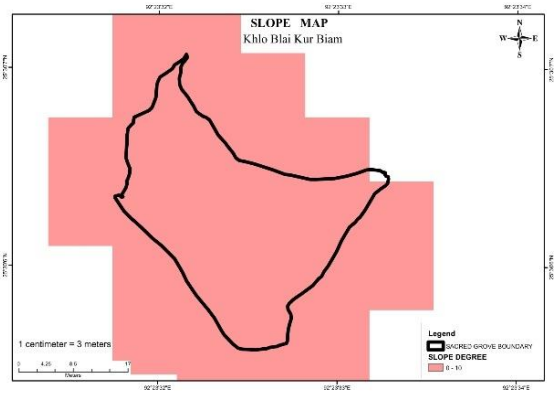
Topography of the grove is gentle rolling in nature which slope varying from 0.2° to 28°. Major part of the *Khlo Blai Kur Biam* falls in the northern aspect. Small area of this forest fall in the North-east aspect. Soil texture is loamy in nature with no coarse fragments. Soil consistency is slightly compact. Soil is black in colour and the soil depth is shallow ranging from 15 cm to 30 cm. Soil erosion has not been observed in this grove.

Winter season starts from end of October and lasts till March of the next year. Rainfall during monsoon season varies from heavy to moderate. Winter months receive very little rain. The summer season is from March to May, while the monsoon season starts from May and ends around October - November.

3.5.4 Forest Type

As per the Champion and Seth classification (1968), forests found in the sacred grove are of the ***Type 8B/C2 Khasi Sub Tropical Wet Hill Forest.***





3.5.5 Forest Cover

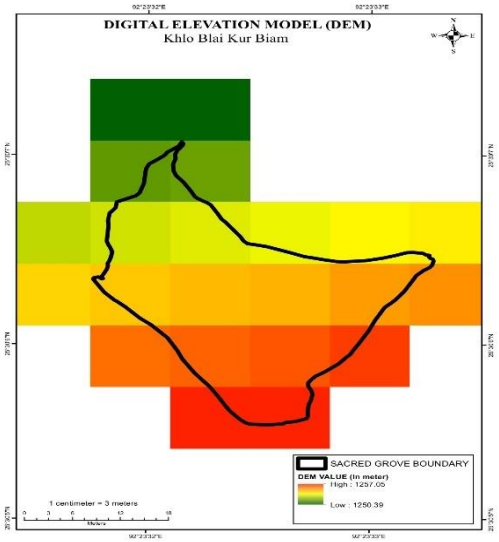
As per the India State of Forest Report-2021 published by the Forest Survey of India, Dehradun, forest cover in the *Khlo Blai Kur Biam* is as below:

Forest Cover	Area (ha.)	% of total Area
Very Dense Forest (> 70%)	0	0
Moderately Dense Forest (40 %-70 %)	0.06	74.20
Open Forest (10% - 40%)	0.00	0.00

Scrub Forest (<10%)	0	0
Non-Forest	0.02	25.80
Total	**0.08**	**100**

3.5.6 Flora and Fauna

The *Khlo Blai Kur Biam* is home of a moderately dense forest of natural origin. *Castanopsis armata* and *Engelhardtia roxburghiana* are respectively 1st and 2nd dominant tree species. The forest is home to a few rare, endangered and endemic plant species.



3.5.6.1 Floral species

Table 3.5.1: Trees found in *Khlo Blai Kur Biam*

Sl. No.	Local Name	Botanical Name	Family
1.	*Dieng stap*	*Castanopsis armata*	*Fagaceae*
2.	*Dieng sning*	*Castanopsis tribuloides*	*Fagaceae*
3.	*Dieng btah*	*Engelhardtia roxburghiana*	*Juglandaceae*
4.	*Dieng lba*	*Engelhardtia spicata*	*Juglandaceae*
5.	*Dieng sohmanir khlaw*	*Gluta wallichii*	*Anacardiaceae*
6.	*Dieng ngan*	*Schima khasiana*	*Theaceae*

Table 3.5.2: Shrubs found in *Khlo Blai Kur Biam*

Sl No.	Local Name	Botanical Name	Family
1.	*Dieng sohtait*	*Cyanotis vaga*	*Commelinaceae*
2.	*La jaremlieh*	*Clerodendrum viscosum*	*Verbenaceae*
3.	*Dieng jamyrait*	*Gaultheria fragranitissima*	*Ericaceae*
4.	*Dieng soh pyrsit*	*Eurya acuminata*	*Theaceae*
5.	*Dieng sohjabuit*	*Phlogacanthus thyrsiflorus*	*Acanthaceae*
6.	*Dieng sohmylleng*	*Phlogacabthus thyrsiflora*	*Acanthaceae*

Table 3.5.3: Herbs found in *Khlo Blai Kur Biam*

Sl No.	Local Name	Botanical Name	Family
1.	*Jajew maw*	*Begonia spp*	*Begoniaceae*
2.	*Jaremlieh*	*Clerodendrum viscosum*	*Verbenaceae*
3.	*Latara*	*Alpinia colacarata*	*Zingiberaceae*
4.	*Tyrkhang*	*Aspemium nidus*	*Asteraceae*
5.	*Bat japan*	*Agevatina adenofara*	*Asteraceae*
6.	*Soh tynriew*	*Calamus erectus*	Arecaceae
7.	*Longniang*	*Potentilla gracilis*	*Rosaceae*

Table 3.5.4: Bamboos found in *Khlo Blai Kur Biam*

Sl No.	Local Name	Botanical Name	Family
1.	*Siej sylli*	*Melocanna baccifera*	*Poaceae*
2.	*Siej sken*	*Bambusa pallida*	*Poaceae*

Table 3.5.5: Ferns found in *Khlo Blai Kur Biam*

Sl No.	Local Name	Botanical Name	Family
1.	*Tyrkhang iong*	*Adiantum raddearnum*	*Pleridaceae*
2.	*Tyrkhang maw*	*Cyathea giganta*	*Cyatheaceae*
3.	*Tyrkhang khlaw*	*Asplinia nidus*	*Aspliniaceae*

Table 3.5.6: Grasses found in *Khlo Blai Kur Biam*

Sl No.	Local Name	Botanical Name	Family
1.	*Phlang thyrnia*	*Arendenella pumila*	*Poaceae*
2.	*Phlang tylli*	*Arendenella khasiana*	*Poaceae*
3.	*Phlang jem*	*Hedyotis uncinalla*	*Rubeaceae*
4.	*Phlang ot*	*Juncus effusus*	*Juncaceae*

3.5.6.2 Faunal Species

No scientific study to assess presence and abundance of wildlife in *Khlo Blai Kur Biam* has been carried out so far. However, as per the local residents some species amphibians, reptile, and bird has been reported in this forest.

3.5.7 Growing Stock

As per the methodology described in Chapter-II, enumeration was carried out in 100% area of the forest as its area is less than 2 ha. All the trees, having girth (over bark) at breast height more than 30 cm, were enumerated by measuring the top height (in meters) and the girth (in centimetres) at breast height. Data collected during the enumeration were entered in Sacred Grove Description Form and Plot Enumeration Form. During the enumeration within the grove, data were collected for 28 trees consisting of 14 *Castanopsis armata* (1st dominant), 7 *Engelhardtia roxburghiana* (2nddominant), 4 *Engelhardtia spicata* (3rd dominant), and 3 rest of Species. Using the Local Volume Equations given in Chapter –II, girth class wise volume was calculated for each species for each of the 13 girth classes starting from 30-40 cm to 151 cm and above. Details of the same are given in the Table 3.5.7 below. As may be seen, total growing stock in this forest is 62.46 cubic metres.

Table 3.5.7: Species wise distribution of growing stock in different girth classes

(cum)

Girth class (cm)	*Castanopsis armata* (1st dominant)	*Engelhardtia roxburghiana* (2nd dominant)	*Engelhardtia spicata* (3rd dominant)	Rest of the species	Total	% of the total growing stock
30-40	0.09	0.00	0.00	0.00	**0.09**	**0.14**
41-50	0.00	0.00	0.00	0.00	**0.00**	**0.00**
51-60	0.21	0.00	0.00	0.00	**0.21**	**0.34**
61-70	0.00	0.42	0.00	0.00	**0.42**	**0.67**
71-80	0.00	0.00	0.00	1.1	**1.10**	**1.76**
81-90	0.68	0.68	0.00	0.00	**1.36**	**2.18**
91-100	0.00	0.00	0.00	0.00	**0.00**	**0.00**
101-110	0.00	0.00	1.20	0.00	**1.20**	**1.92**
111-120	4.00	2.82	1.40	0.00	**8.22**	**13.16**
121-130	1.55	1.66	1.60	0.00	**4.81**	**7.70**
131-140	3.93	0.00	0.00	1.90	**5.83**	**9.33**
141-150	0.00	2.07	0.00	0.00	**2.07**	**3.31**
151 & above	26.57	3.08	7.50	0.00	**37.15**	**59.48**
Total	**37.03**	**10.73**	**11.70**	**3.00**	**62.46**	**100.00**
% of Total growing stock	59.29	17.18	18.73	4.80	100.00	

As may be seen, 59.29%, the total growing stock is contributed by the 1st dominant species (*Castanopsis armata)*. The 2nd dominant species (*Engelhardtia roxburghiana*) constitutes 17.18% of the total growing stock. Similarly, the 3rd dominant species *(Engelhardtia spicata)* constitutes 18.73 % of the total growing stock (*i.e.* 4.80 %) is constituted by the rest of the species.

Figure 3.5.1:Girth class-wise distribution of growing stock

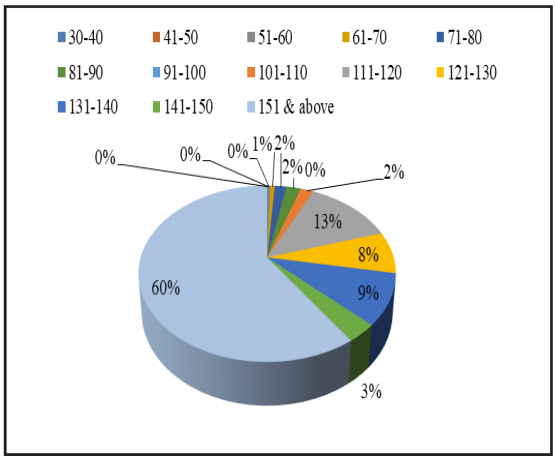


Figure 3.5.2: Species-wise distribution of growing stock

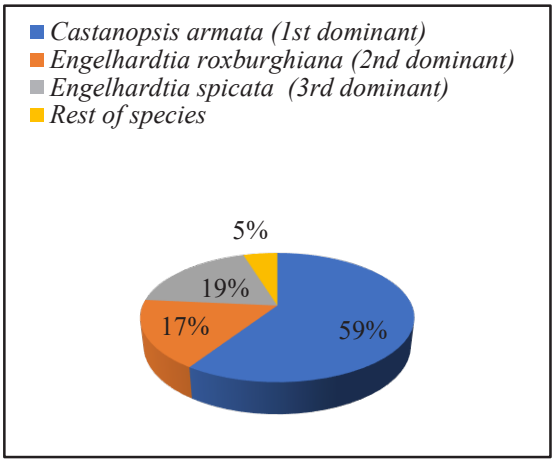


Figure 3.5.3:Girth class-wise Distribution of Growing stock

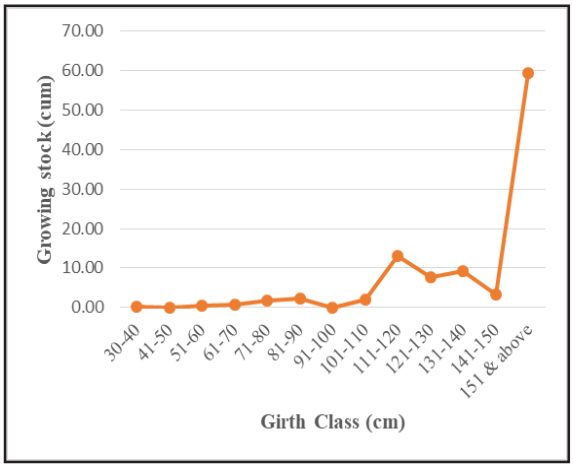


Figure 3.5.4: Overview of *Khlo Blai Kur Biam*



3.5.8 Number of Stems

Species-wise number of stems in each girth class are given in Table 3.5.8 below. As may be seen maximum numbers of stems are found in higher girth classes *i.e.* from 111-120 cm to 151 cm and above. It indicates that majority of trees in this forest are old matured 'heritage trees'.

Table 3.5.8: Species-wise distribution of stems in different girth classes

(numbers of stems)

Girth class (cm)	*Castanopsis armata* (1st dominant)	*Engelhardtia roxburghiana* (2nd dominant)	*Engelhardtia spicata* (3rd dominant)	Rest of the species	Total
30-40	1	0	0	0	**1**
41-50	0	0	0	0	**0**
51-60	1	0	0	0	**1**
61-70	0	1	0	0	**1**
71-80	0	0	0	2	**2**
81-90	1	1	0	0	**2**
91-100	0	0	0	0	**0**
101-110	0	0	1	0	**1**
111-120	3	2	1	0	**6**
121-130	1	1	1	0	**3**
131-140	2	0	0	1	**3**
141-150	0	1	0	0	**1**
151 & above	5	1	1	0	**7**
Total	**14**	**7**	**4**	**3**	**28**

Figure 3.5.5:Number of stems in different girth classes

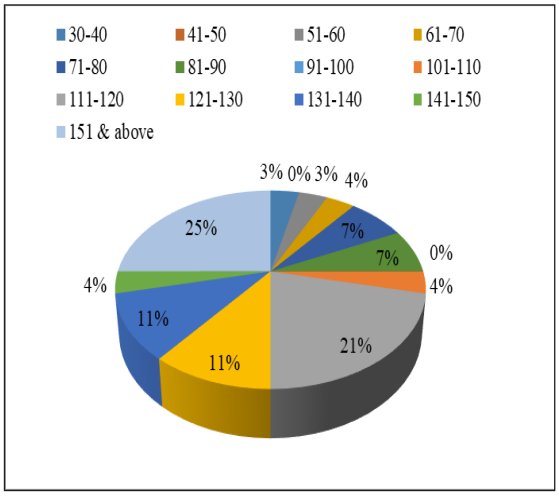


Figure 3.5.6: Species-wise distribution of stems

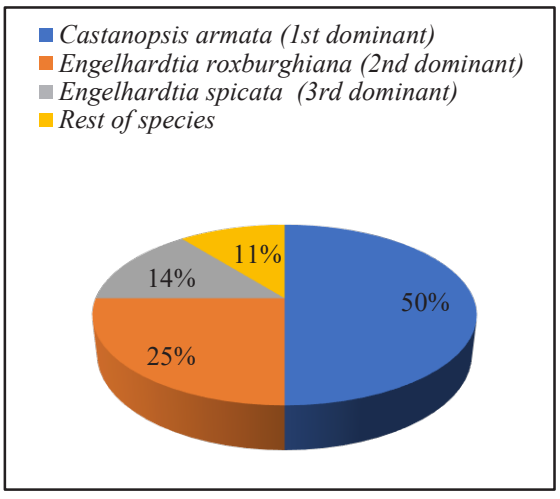


Figure 3.5.7:Number of stems in different girth classes

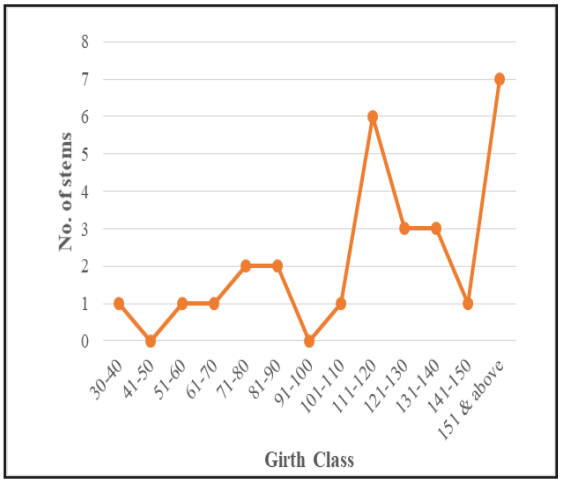


Figure 3.5.8: Inside view of *Khlo Blai Kur Biam*



3.5.9 Prescriptions for Future Management

3.5.9.1 Registration with the Jaintia Hills Autonomous District Council

The United Khasi-Jaintia Hills Autonomous District (Management and Control of Forests) Rules, 1960 provides for registration of each sacred grove located in areas falling under jurisdiction of the Jaintia Hills Autonomous District Council (JHADC). Though these rules came into force about 65 years ago, the *Khlo Blai Kur Biam* has not been registered with the JHADC. The Chief Forest Officer of the JHADC and the *Biam* Clan may take immediate necessary actions, as provided in Chapter-I of the said rules to register the *Khlo Blai Kur Biam* with the JHADC. The same will accord legal recognition and protection from diversion for non-forestry purposes.

3.5.9.2 Notification as Community Reserve

Section 38C of the Wild Life (Protection) Act, 1972 provides that the State Government may, where the community or an individual has volunteered to conserve wild life and its habitat, declare any private or community land not comprised within a National Park, Wildlife Sanctuary or a Conservation Reserve, as a Community Reserve, for protecting fauna, flora and traditional or cultural conservation values and practices. Notification of an area as a Community Reserve accords it legal protection. It also makes it eligible to receive financial assistance under a Centrally Sponsored Scheme of 'Integrated Development of Wildlife Habitats'. The *Biam* Clan of *Khlo Blai Kur Biam* and Wildlife Wing in the Forest and Environment Department, Government of Meghalaya may therefore take necessary actions for notification of the *Khlo Blai Kur Biam* as a Community Reserve.

3.5.9.3 Boundary Demarcation

Boundary of the *Khlo Blai Kur Biam* is constituted by permanent features such as roads and schools. It may be fenced by erection of RCC boundary pillar along the boundary to preserve the ancient nature of this forest.

3.5.9.4 Fire Protection

As per the Meghalaya Forest Fire Information System, during a period of 22 years (2002 - 2024) zero fire incident has occurred in the *Khlo Blai Kur Biam*. As per the Meghalaya Forest Fire Information System developed by the North Eastern Space Application Centre (NESAC) a major part of the *Khlo Blai Kur Biam* is moderately to highly vulnerable to forest fires. However, as per the said information system, *Khlo Blai Kur Biam* is not prone to forest fire. To prevent damage to the *Khlo Blai Kur Biam* from accidental forest fires, measures such as creation and periodic cleaning of fire line along the periphery and at critical locations within the *Khlo Blai Kur Biam* and engagement of fire watchers during the critical months may be undertaken.

3.5.9.5 Construction of Soil Moisture Conservation and Water Harvesting Structures

Khlo Blai Kur Biam does not have any perennial water source. To prevent and minimise soil erosion and to improve moisture regime, appropriate soil and water harvesting structures may be constructed at suitable locations in the *Khlo Blai Kur Biam.*

3.5.9.6 Creation of Eco-Tourism Facilities

To create awareness about rich biodiversity of the *Khlo Blai Kur Biam* and also to create livelihood opportunities for local residents, eco-tourism facilities such as rain shelter cum view point, walking trail, sign board, washrooms *etc.* may be constructed to attract tourists.

3.5.9.7 Restocking of Degraded Areas

Efforts may be made to restock the degraded patches in *Khlo Blai Kur Biam* by assisting and promoting natural regeneration of native species. Parts of the sacred grove which cannot be restocked by assisted natural regeneration alone may be afforested by planting seedlings of native species.

3.5.9.8 Formulation of A Proposal and Registration Thereof on Carbon Registry to Earn Carbon Credits

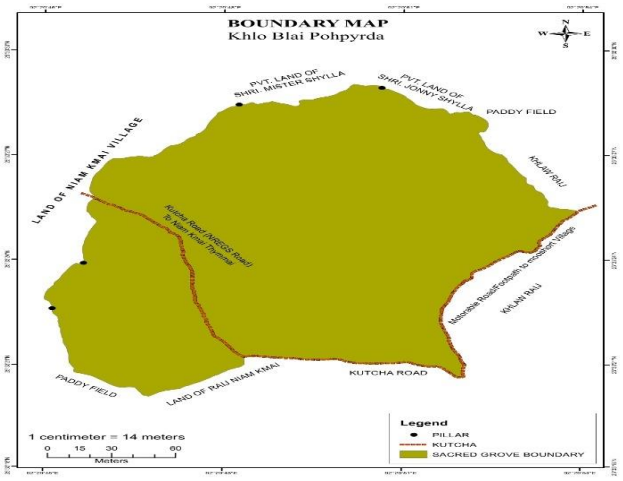
To reward the local communities for their efforts in conservation and protection of *Khlo Blai Kur Biam for* centuries, a proposal may be formulated and registered on an appropriate carbon registry to earn carbon credits for measures to be taken by the local communities for better protection and conservation of the *Khlo Blai Kur Biam*.

3.5.9.9 Awareness Campaign

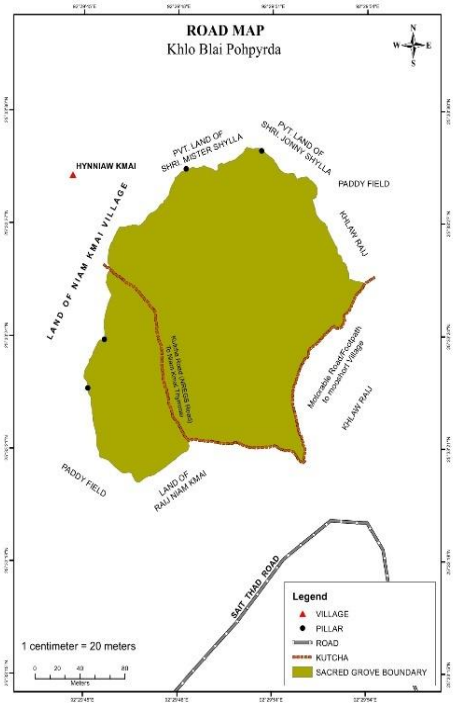
The *Khlo Blai Kur Biam* has been protected by the Biam Clan for centuries for spiritual, conservation and cultural beliefs. With gradual subordination of these beliefs, local communities concern for conservation and protection of sacred groves and other community owned forests is gradually declining. The same therefore need to be revived and strengthened by creating awareness among the local communities and grassroot level institutions about cultural, heritage and economic importance of sacred groves and other community owned forests.

3.6. *KHLO BLAI POHPYRDA*

3.6.1 Location

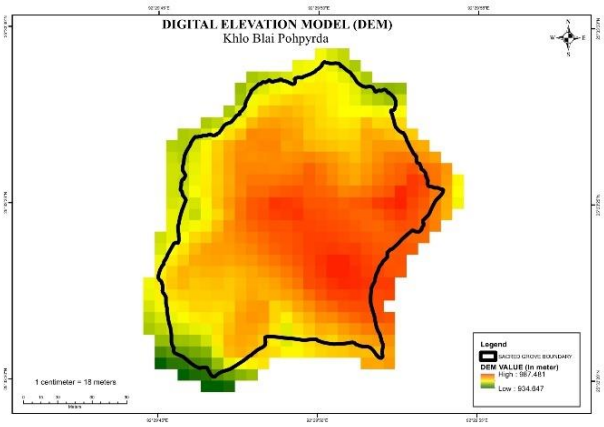


Khlo Blai Pohpyrda is situated in West Jaintia Hills District of Meghalaya at *Niawkmai* village in Elaka *Raliang Dolloiship*. It covers an area of 4.36 ha and lies between 25° 33. 21" to 25° 33′ 27 N latitude and 92° 29′ 45″ to 92° 29′ 53″ E Longitude at an altitude of 1021 m above mean sea level. It is bounded in the North by private land of Shri. Mister Shylla, Private land of Shri Jonny Shylla and paddy field, in the East by *Khlaw Raij* and a motorable road to *Mooshrat* Village, in the West by land of *Niawkmai* village and paddy field and in the South by Land of *Raij Niaw Kmai* and a *Kutcha* Road. The grove is accessible by road from *Jowai* to *Niawkmai* village. It is located at a distance of about 50 km from the *Jowai*. This grove is managed by village dorbar of *Niawkmai* village with the help of the *Lyngdoh* (priest).

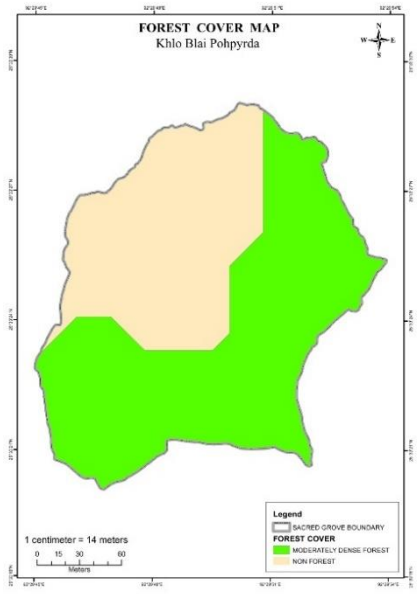




3.6.2 Brief History



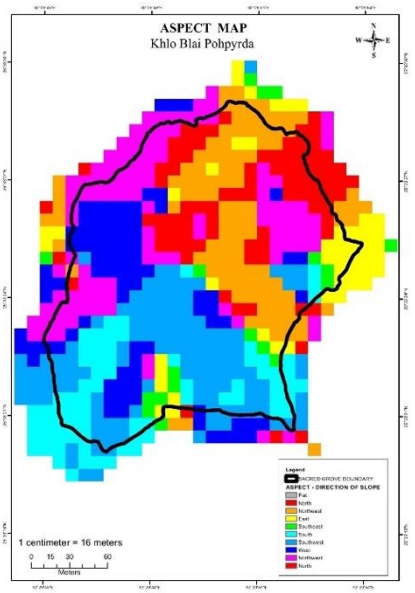
Khlo Blai Pohpyrda has in existence for several decades. Offerings and prayers are still performed in this grove by way of sacrificing poultry/livestock; to appease the *Basa* (Deiti) who in-turn bless and protect the Kingdom and its subject. The grove is located in Niawkmai village. The same is managed by village dorbar of *Niawkmai* village with the help of the *Lyngdoh* (priest). Offering and prayer to deities are offered by the *Lyngdoh* of *Niawkmai* village. Beside the spiritual significant, the grove is well known for its rich floral diversity that adds to its beauty. Entry in this grove is strictly prohibited without prior permission from the *Lyngdoh*.



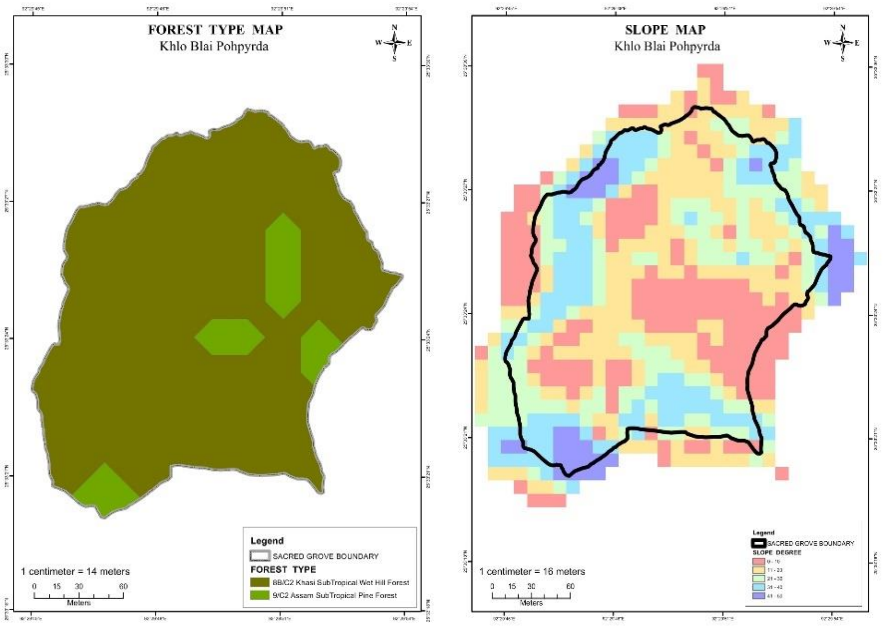
Felling of trees, hunting, poaching and grazing are strictly prohibited. Biotic pressures such as encroachments, hunting, poaching and illegal felling of trees found to be absent from this forest.

3.6.3 Geography and Climate

Topography of the grove is gentle rolling in nature which slope varying from 0.5° to 30°. *Khlo Blai Pohpyrda* falls under different aspects as shown in the 'Aspect Map'. Soil texture is loamy in nature with no coarse fragments. Soil consistency is slightly compact. Soil is black in colour and the soil depth is moderate ranging from 25 cm to 40 cm. No soil erosion has been observed in this grove.



Winter season starts from end of October and lasts till March of the next year. Rainfall varies from heavy to moderate. The summer season is from March to May, while the monsoon season starts from May and end around October-November.



3.6.4 Forest Type

As per the Champion and Seth classification (1968), forests found in the sacred grove are of the ***Type 8B/C2 Khasi Sub Tropical Wet Hill Forest***. A small portion in the grove belongs to **Type *9/C2 Assam Sub Tropical Pine Forest.***

3.6.5 Forest Cover

As per the India State of Forest Report-2021 published by the Forest Survey of India, Dehradun, a major part of *Khlo Blai Pohpyrda* falls under 'Moderately Dense Forest' category.

3.6.6 Flora and Fauna

The *Khlo Blai Pohpyrda* is home to moderately dense forest of natural origin. *Castanopsis hystrix* and *Schima khasiana species* are respectively 1st and 2nd dominant tree species. The forest is home to some rare, endangered and endemic plant species.

3.6.6.1: Floral species

Table 3.6.1: Trees found in *Khlo Blai Pohpyrda*

Sl. No.	Local Name	Botanical Name	Family
1.	*Dieng kreit*	*Albizzia lebbek*	*Fabaceae*
2.	*Dieng shyrmi*	*Apodytes dimidiata*	*Icacinaceae*
3.	*Dieng latymphu*	*Aralia armata*	*Araliaceae*
4.	*Dieng lieng*	*Betula alnoides*	*Betulaceae*

5.	*Dieng kya*	*Bombax ceiba*	*Malvaceae*
6.	*Dieng sohsyllei*	*Carallia brachiate*	*Carallia brachiata*
7.	*Dieng tlai*	*Caryota urens*	*Arecacea*
8.	*Dieng stap*	*Castanopsis hystrix*	*Fagaceae*
9.	*Dieng sning*	*Castanopsis tribuloides*	*Fagaceae*
10.	*Dieng jarymphew*	*Chloanthes parviflora*	*Lamiaceae*
11.	*Dieng thyrthia*	*Cinnamomum pauciflorum*	*Lauraceae*
12.	*Unknown*	*Ecclenusa ramiflora*	*Sapotaceae*
13.	*Dieng bsiang*	*Ehretia wallichiana*	*Boraginaceae*
14.	*Dieng ruin*	*Eleocarpus prunifolius*	*Elaeocarpaceae*
15.	*Dieng lasaw*	*Eleocarpus robusta*	*Elaeocarpaceae*
16.	*Dieng sohmylleng*	*Emblica officcinalis*	*Phyllanthaceae*
17.	*Dieng mattah*	*Engelhardia roxburghiana*	*Juglandaceae*
18.	*Dieng song*	*Erythrina indica*	*Fabaceae*
19.	*Dieng sohum*	*Eugenia jambolana*	*Myrtaceae*
20.	*Dieng jri*	*Ficus benjamina*	*Moraceae*
21.	*Dieng sohmeblang*	*Grewia abutilifolia*	*Myrtaceae*
22.	*Dieng sohliang*	*Gynocardia odorata*	*Clusiaceae*
23.	*Dieng sohshyieng*	*Ilex venulosa*	*Aquifoliaceae*
24.	*Dieng sohsying*	*Litsea cubeba*	*Lauraceae*
25.	*Dieng tler*	*Litsea laeta*	*Lauraceae*
26.	*Dieng sohpingiong*	*Magnifera sylvatica*	*Anacardiaceae*
27.	*Dieng ngai*	*Mesua ferrea*	*Calophyllaceae*
28.	*Dieng rai*	*Michelia champaca*	*Magnoliaceae*
29.	*Dieng sohliya*	*Myrica nagi*	*Myricaceae*
30.	*Dieng sasei*	*Pasania fenestrata*	*Fagaceae*
31.	*Dieng pdem*	*Persea patiolaris*	*Lauraceae*
32.	*Dieng myllen*	*Phyllanthus emblica*	*Phyllanthaceae*
33.	*Dieng kseh*	*Pinus khasiana /kesiya*	*Pinaceae*
34.	*Dieng jakba*	*Polygata arillata*	*Polygalaceae*
35.	*Dieng lakhoh*	*Pterospermum acerifolium*	*Malvaceae*
36.	*Dieng sai*	*Quercus dealbata*	*Fagaceae*
37.	*Dieng sari*	*Quercus glauca*	*Fagaceae*
38.	*Dieng rtiang*	*Quercus sereta*	*Fagaceae*
39.	*Dieng sohmatan*	*Randia griffithii*	*Rubiaceae*
40.	*Dieng kain*	*Rhus succedanea*	*Anacardiaceae*
41.	*Dieng sohkyndid*	*Sauropus androgynus*	*Phyllanthaceae*
42.	*Dieng ngan*	*Schima khasiana*	*Theaceae*
43.	*Dieng sohlait*	*Spondias axillaris*	*Anacardiaceae*
44.	*Dieng psiar*	*Stereospermum chelonoides*	*Bignoniaceae.*

45.	*Unknown*	*Swietenia mahagoni*	*Meliaceae*
46.	*Dieng iong*	*Symplocos chinensis*	*Symplocaceae*
47.	*Dieng sir (Deing pei)*	*Symplocus theaefolia*	*Symplocaceae*
48.	*Dieng sohliwa*	*Syzygium aqueum*	*Myrtaceae*
49.	*Dieng bti*	*Toona ciliata*	*Meliaceae*
50.	*Dieng kreit*	*Albizzia lebbek*	*Fabaceae*
51.	*Dieng shyrmi*	*Apodytes dimidiata*	*Icacinaceae*

Table 3.6.2: Shrubs found in *Khlo Blai Pohpyrda*

Sl No.	Local Name	Botanical Name	Family
1.	*Lamet*	*Phrynium*	*Pubinevve*
2.	*La jaremlieh*	*Clerodendrum viscosum*	*Verbenaceae*
3.	*Dieng sohjabuit*	*Phlogacanthus thyrsiflorus*	*Acanthaceae*
4.	*Jarem iong*	*Clerodendrum colebrookianum*	*Verbenaceae*
5.	*Dieng ranong*	*Mahonia pycnophylla*	*Berberidaceae*
6.	*Dieng lari-ria*	*Cinnamomum spp*	*Lauraceae*
7.	*Dieng tyrnem*	*Camelia camdula*	*Theaceae*
8.	*Dieng sohlaper*	*Pinanga gracilis*	*Arecaceae*
9.	*Dieng tluh*	*Sterculia villosa*	*Malvaceae*

Table 3.6.3: Herbs found in *Khlo Blai Pohpyrda*

Sl No.	Local Name	Botanical Name	Family
1.	*Jajew khlaw*	*Begonia roxburghii*	*Begoniaceae*
2.	*Syieng khlaw*	*Zengiber purpureum*	*Zingiberaceae*
3.	*Synrai khlaw*	*Alpinia spp.*	*Gingiberaceae*
4.	*Phud wang*	*Colocasia spp.*	*Araceae*
5.	*Wang khlaw*	*Esculenta spp.*	*Araceae*
6.	*Jajewla*	*Aconitum ferox*	*Ranunculaceae*
7.	*Latara*	*Dianthus chinensis*	*Caryophyllaceae*
8.	*Syieng ja*	*Allium hookeri*	*Amaryllidaceae*
9.	*Jalyngthem*	*Polygonum chinense*	*Polygonaceae*
10.	*Tyrkhang maw*	*Cyathea gigantea*	*Cyatheaceae*
11.	*Tyrkhang khlaw*	*Asplenium nidus*	*Aspleniaceae*
12.	*Tiew syieng*	*Zingiber purpureum*	*Zingiberaceae*
13.	*Jajew khlaw*	*Begonia roxburghii*	*Begoniaceae*

Table 3.6.4: Climbers found in *Khlo Blai Pohpyrda*

Sl No.	Local Name	Botanical Name	Family
1.	*Jyrni lieh*	*Passiflora edulis*	*Passifloraceae*
2.	*Jyrni khlaw*	*Pisonia aculeate*	*Nyctaginaceae*
3.	*Jyrni pur*	*Byttneria aspera*	*Sterculiaceae*
4.	*Lapadong*	*Monochoria vaginalis*	*Pontederiaceae*
5.	*Jyrni niun*	*Ampelocissus latifolia*	*Vitaceae*
6.	*Jyrni lieh*	*Passiflora edulis*	*Passifloraceae*
7.	*Soh shangkhlaw*	*Thunbergia laurifolia*	*Acanthaceae*
8.	*Shiah krot*	*Niselose zeylanica*	*Smilaceceae*
9.	*Soh nepbah*	*Rubus rugosus*	*Rosaceae*
10.	*Pew shrieh*	*Hedera nepalensis*	*Araliaceae*
11.	*Jyrni nup*	*Vitis vinifera*	*Vitaceae*
12.	*Loapla*	*Rhaphidophora decursiva*	*Araceae*
13.	*Jyrni pur*	*Cocculus hirsutus*	*Menispermaceae*
14.	*Siah nepbah*	*Ampelocissus latifolia*	*Vitaceae*
15.	*Siah sohkrot*	*Smilax glabra*	*Smilacaceae*
16.	*Scharu*	*Cissampelos pareira*	*Menispermaceae*

Table 3.6.5: Grasses found in *Khlo Blai Pohpyrda*

Sl No.	Local Name	Botanical Name	Family
1.	*Phlang ot*	*Juncus effusus*	*Juncaceae*
2.	*Synsar*	*Thysanolaena maxima*	*Poaceae*
3.	*Phlang tylli*	*Arundinella khasiana*	*Poaceae*
4.	*Phlang thyrnia*	*Arundinella pumila*	*Poaceae*

Table 3.6.6: Ferns found in *Khlo Blai Pohpyrda*

Sl No.	Local Name	Botanical Name	Family
1.	*Tyrkhang*	*Asplenium nidus*	*Aspleniaceae*
2.	*Tyrkhang maw*	*Cyathea gigantea*	*Cyatheaceae*
3.	*Tyrkhang nar*	*Lophosoria quadripinnata*	*Dicksoniaceae*
4.	*Tyrkhang khlaw*	*Asplenium nidus*	*Aspleniaceae*
5.	*Tyrkhang syieng*	*Adiantum raddianum*	*Pteridaceae*

3.6.6.2 Faunal Species

No scientific study to assess presence and abundance of wildlife in *Khlo Blai Pohpyrda* has been carried out so far. However, as per the local residents, presence of some wild animals such as jungle fowls, jackal, and numerous amphibians, reptile, bird and mammal has been reported from this forest.

3.6.7 Growing Stock

As per the methodology described in Chapter-II, enumeration was carried out in 10 sample plots as its area is more than 2 ha. In each sample plots all the trees, having girth (over bark) at breast height more than 30 cm, were enumerated by measuring the top height (in meters) and the girth (in centimetres) at breast height. Data collected during the enumeration were entered in Sacred Groves Description Form and Plot Enumeration Form. During the enumeration within the grove, data were collected for 578 trees consisting of 105 *Castanopsis hystrix* (1st dominant), 51 *Schima khasiana* (2nddominant), 48 *Ehretia wallichiana* (3rd dominant), and 374 rest of species. Using the Local Volume Equations given in Chapter –II, girth class wise volume was calculated for each species for each of the 13 girth classes starting from 30-40 cm to 151 cm and above. Details of the same are given in the Table 3.6.7 below. As may be seen, total growing stock in this forest is 1,524.18 cubic metres.

Table 3.6.7: Species-wise distribution of growing stock in different girth classes in the entire forest

(cum)

Girth Class (cm)	*Castanopsis lystric* (1st dominant)	*Schima khasiana* (2nd dominant)	*Ehretia wallichiana* (3rd dominant)	Rest of the species	Total	% of total growing stock
30-40	0.73	0.38	0.17	3.28	**4.56**	0.30
41-50	1.33	0.10	0.51	8.52	**10.46**	0.69
51-60	2.83	0.99	1.75	11.08	**16.65**	1.09
61-70	5.63	1.19	3.27	9.33	**19.42**	1.27
71-80	4.30	0.96	4.93	14.15	**24.34**	1.60
81-90	5.26	2.99	0.68	10.49	**19.42**	1.27
91-100	6.02	0.96	2.71	16.15	**25.84**	1.70
101-110	6.85	1.13	6.44	13.72	**28.14**	1.85
111-120	16.04	1.48	0.00	28.49	**46.01**	3.02
121-130	9.84	3.38	5.01	22.42	**40.65**	2.67
131-140	7.47	0.00	2.04	16.98	**26.49**	1.74
141-150	4.32	10.93	2.16	17.64	**35.05**	2.30
151 & above	311.16	118.73	4.92	792.34	**1227.15**	80.51
Total	**381.78**	**143.22**	**34.59**	**964.59**	**1524.18**	100.00
% of total growing stock	**25.05**	**9.40**	**2.27**	**63.29**	**100.00**	

As may be seen, 25.05%, the total growing stock is contributed by the 1st dominant species (*Castanopsis hystrix)*. The 2nd dominant species (*Schima khasiana*) constitutes 9.40% of the total growing stock. Similarly, the 3rd dominant species *(Ehretia wallichiana)* constitutes 2.27 % of the total growing stock. A major part of the growing stock (*i.e.*63.29 %) is constituted by the rest of the species.

Figure 3.6.1:Girth class-wise distribution of growing stock

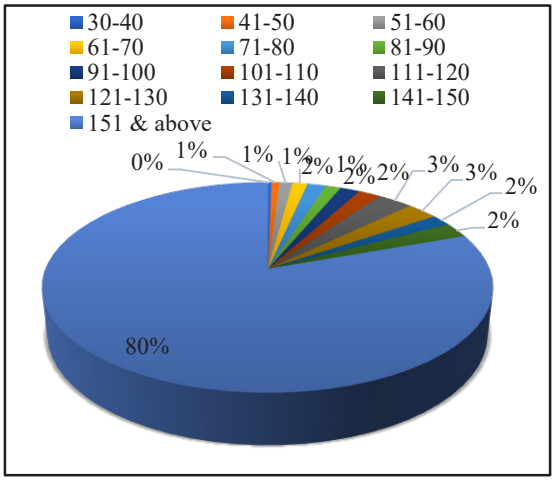


Figure 3.6.2: Species-wise distribution of growing stock

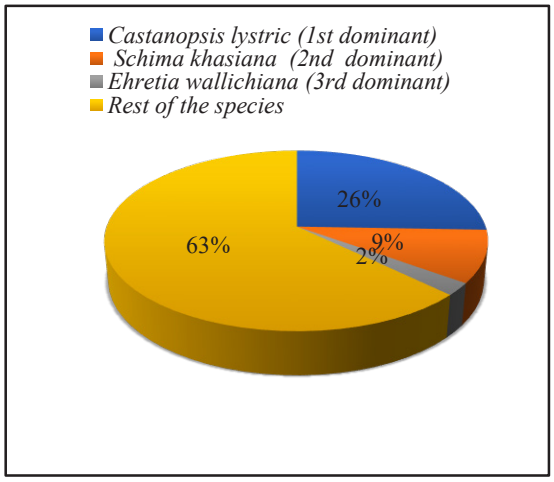


Figure 3.6.3: Girth class-wise distribution of growing stock

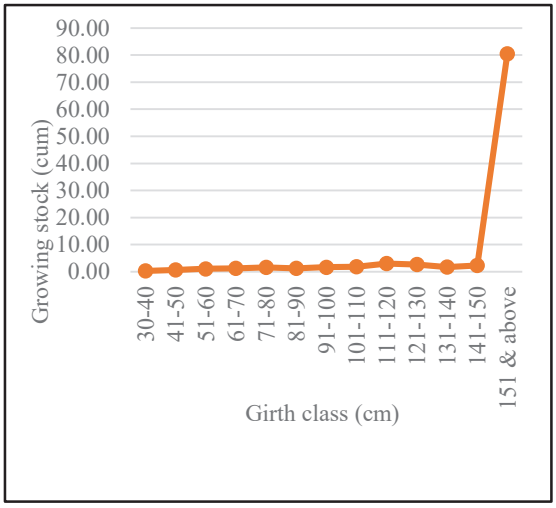
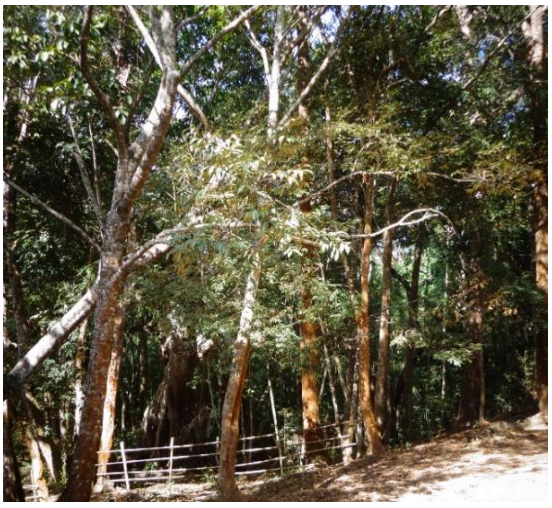


Figure 3.6.4: Overview of *Khlo Blai Pohpyrda*



3.6.8 Number of Stems

Species-wise number of stems in each girth class are given in Table 3.6.8 below. As may be seen, stem population is distributed across all the girth classes which depicts a mature forest ecosystem with overgrown trees.

Table 3.6.8: Species-wise distribution of stems in different girth classes in the entire forest

(numbers of stems)

Girth Class (cm)	*Castanopsis lystric* (1st dominant)	*Schima khasiana* (2nd dominant)	*Ehretia wallichiana* (3rd dominant)	Rest of the species	Total
30-40	14	5	4	61	84
41-50	9	1	4	62	76
51-60	10	4	7	45	66
61-70	16	3	8	24	51
71-80	9	2	9	26	46
81-90	7	4	1	15	27
91-100	7	1	3	18	29
101-110	6	1	6	12	25
111-120	12	1	0	21	34
121-130	6	2	3	14	25
131-140	4	0	1	9	14
141-150	2	5	1	8	16
151 & above	3	22	1	59	85
Total	**105**	**51**	**48**	**374**	**578**

Figure 3.6.5:Number of stems in different girth classes

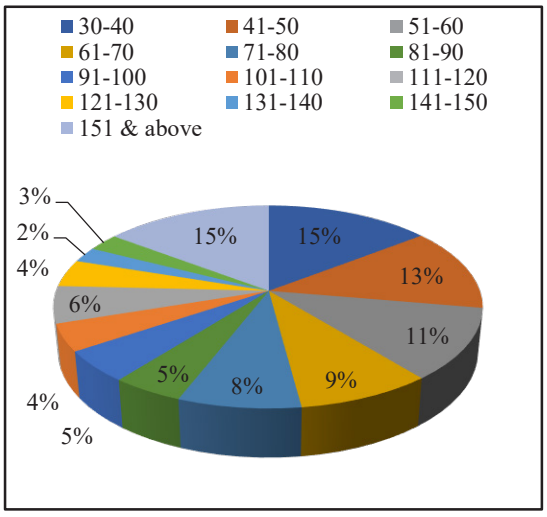


Figure 3.6.6: Species-wise distribution of stems

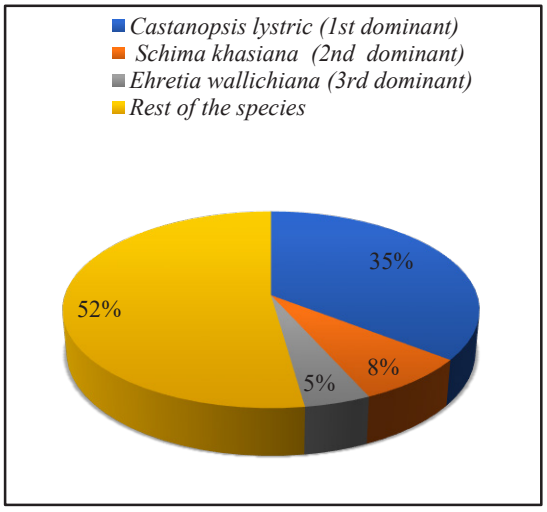


Figure 3.6.7:Number of stems in different girth classes

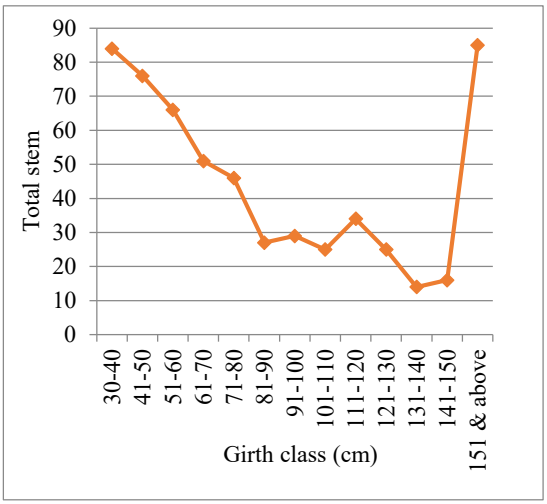


Figure 3.6.8: Inside view of *Khlo Blai Pohpyrda*



3.6.9 Prescriptions for Future Management

3.6.9.1 Registration with the Jaintia Hills Autonomous District Council

The United Khasi-Jaintia Hills Autonomous District (Management and Control of Forests) Rules, 1960 provides for registration of each *Khlo Blai* located in areas falling under jurisdiction of the Jaintia Hills Autonomous District Council (JHADC). Though these rules came into force about 65 years ago, the *Khlo Blai Pohpyrda* has not been registered with the JHADC. The Chief Forest Officer of the JHADC, Village *Dorbar* of *Niawkmai* village and *Lyngdoh* of *Khlo Blai Pohpyrda* may take immediate necessary actions, as provided in Chapter-I of the said rules to register the *Khlo Blai Pohpyrda* with the JHADC. The same will accord legal recognition and protection from diversion for non-forestry purposes.

3.6.9.2 Notification as Community Reserve

Section 38C of the Wild Life (Protection) Act, 1972 provides that the State Government may, where the community or an individual has volunteered to conserve wild life and its habitat, declare any private or community land not comprised within a National Park, Wildlife Sanctuary or a Conservation Reserve, as a Community Reserve, for protecting fauna, flora and traditional or cultural conservation values and practices. Notification of an area as a Community Reserve accords it legal protection. It also makes it eligible to receive financial assistance under a Centrally Sponsored Scheme of 'Integrated Development of Wildlife Habitats'. The Village *Dorbar* of *Niawkmai* village, *Lyngdoh* of *Khlo Blai Pohpyrda* and Wildlife Wing in the Forest and Environment Department, Government of Meghalaya may therefore take necessary actions for notification of the *Khlo Blai Pohpyrda* as a Community Reserve.

3.6.9.3 Boundary Demarcation

Boundary of the *Khlo Blai Pohpyrda* has not been physically demarcated on the ground. The same may result in intentional or unintentional encroachment. Since the grove is bounded in North East by private land and a motorable road and in the North West by land of *Niawkmai* Village and in the South by Kutcha Road, it may be demarcated by erection of RCC boundary pillar and painting of rings on stem of trees standing on the boundary.

3.6.9.4 Fire Protection

As per the Meghalaya Forest Fire Information System, developed by the North Eastern Space Application Centre (NESAC) during a period of 22 years (2002 -2024) no fire incident has occurred in the *Khlo Blai Pohpyrda*. As per the said information system a major part of the *Khlo Blai Pohpyrda* is moderately vulnerable to forest fires. A major part of *Khlo Blai Pohpyrda,* as per the said information system is however not prone to forest fire. To prevent damage to the *Khlo Blai Pohpyrda* from accidental forest fires, measures such as creation and periodic cleaning of fire line along the periphery and at critical locations within the *Khlo Blai Pohpyrda* and engagement of fire watchers during the critical months may be taken.

3.6.9.5 Construction of Soil Moisture Conservation and Water Harvesting Structures

No perennial stream flows through the *Khlo Blai Pohpyrda*. To prevent and minimise soil erosion and to improve moisture regime, water harvesting structures such as check dam, contour trench, may be constructed at suitable locations in the *Khlo Blai Pohpyrda.*

3.6.9.6 Creation of Eco-Tourism Facilities

To create awareness about rich biodiversity of the *Khlo Blai Pohpyrda* and also to create livelihood opportunities for local residents, eco-tourism facilities such as rain shelter cum view point, footpath/ walking trail, sign board, washrooms *etc.* may be constructed to attract tourists.

3.6.9.7 Restocking of Degraded Areas

Efforts may be made to restock the degraded patches in *Khlo Blai Pohpyrda* by assisting and promoting natural regeneration of native species. Areas which can not be restocked by the natural regeneration alone seedlings of native species should be planted.

3.6.9.8 Formulation of A Proposal and Registration Thereof on Carbon Registry to Earn Carbon Credits

To reward the local communities for their efforts in conservation and protection of *Khlo Blai Pohpyrda* for centuries, a proposal may be formulated and registered on an appropriate carbon registry to earn carbon credits for measures to be taken by the local communities for better protection and conservation of the *Khlo Blai Pohpyrda*.

3.6.9.9 Awareness Campaign

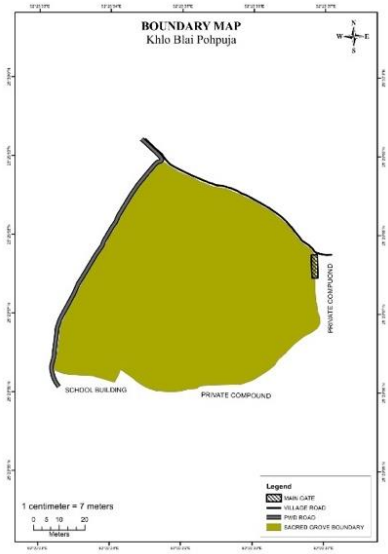
The *Khlo Blai Pohpyrda* has been protected by the *Niawkmai Lyngdoh* for centuries for spiritual, conservation and cultural beliefs. With gradual subordination of these beliefs, local

communities' concern for conservation and protection of sacred groves and other community owned forests is deteriorating. The same therefore needs to be revived and strengthened by creating awareness among the local communities and grassroot level institutions about cultural, heritage and economic importance of sacred groves and other community owned forests.

3.7. *KHLO BLAI POHPUJA*

3.7.1 Location

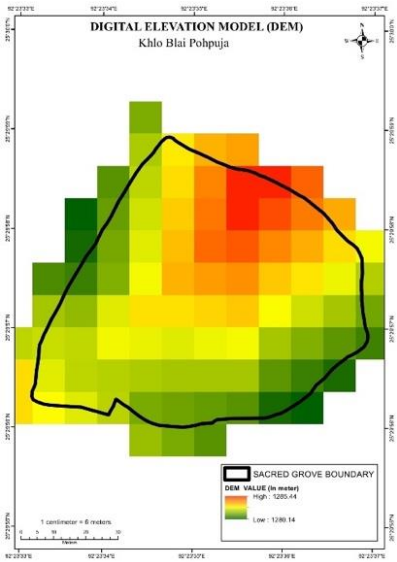
Khlo Blai Pohpuja is situated in West Jaintia Hills District of Meghalaya at *Raliang* village under the *Elaka Raliang* Daloiship. It covers an area of 0.63 ha and lies between 25° 29. 56" to 25° 29′ 59 N latitude and 92° 23′33″ to 92° 23′ 36″ E longitude at an altitude of 1,340 m above mean sea level. It is bounded in the North-East by village road and in the South by school building, private compound and in the West by village road. The grove is located on *Jowai- Raliang* road at about 27 km from *Jowai*.





3.7.2 Brief History

Khlo Blai Pohpuja is in existence for centuries. Since the majority of the villagers are *Niam Tre* believers, the religious significance of the grove has not diminished as offerings and prayers are still being practiced in the form of annual animal sacrifice. This grove has been managed and controlled by the *Lyngdoh* of *Sein Raij*. The grove houses a sanctum sanctorum in which religious rituals are performed. Due its religious significance, the grove is considered to house various deities and thus entry to the grove is strictly prohibited for the general public. Felling of trees, hunting and poaching, grazing is also strictly prohibited.

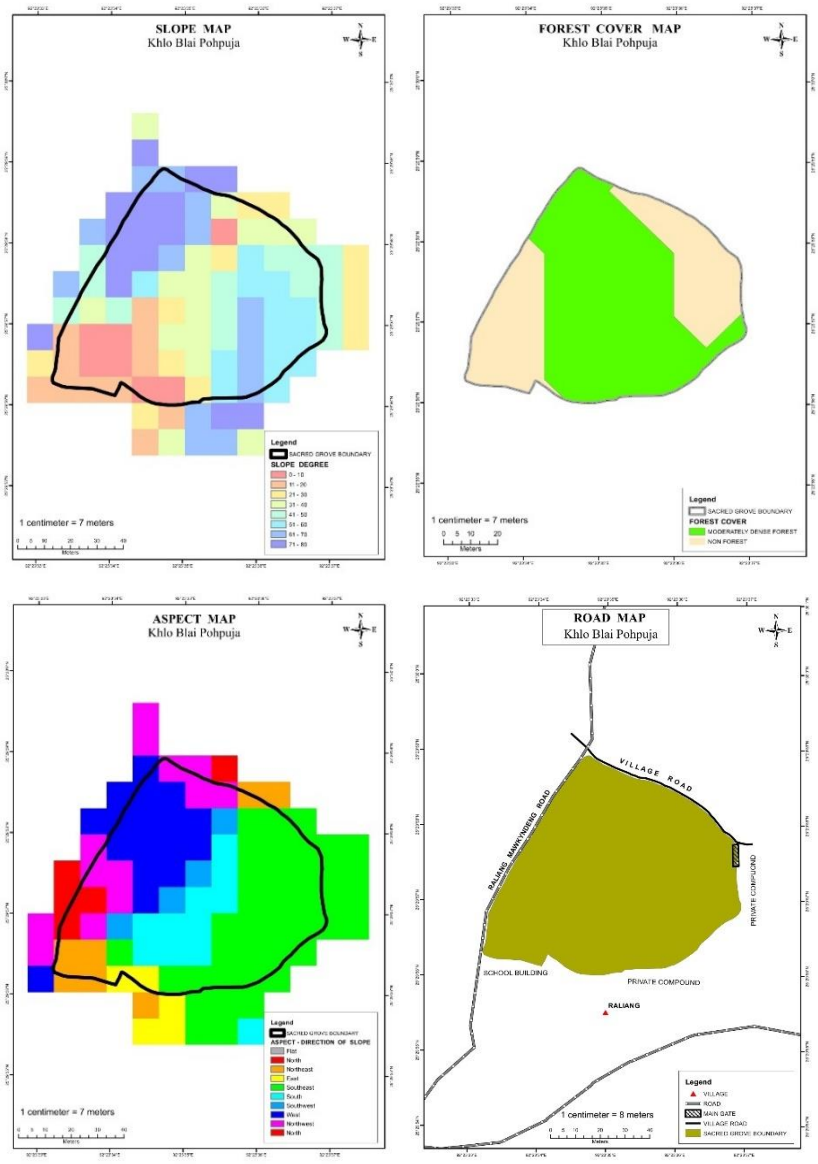


Biotic pressures such as encroachments, hunting, poaching and illegal felling of trees are found to be absent absent in this forest.

3.7.3 Geography and Climate

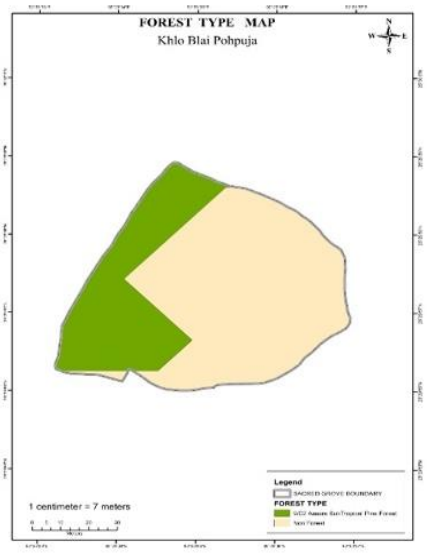
Topography of the grove is flat in nature which slope varying from 0.1° to 5°. Major part of the *Khlo Blai Pohpuja* fall in the Western and South-West aspects. Soil texture is loamy in nature with no coarse fragments. Soil consistency is slightly compact. Soil is black in colour and the soil depth is moderate ranging from 25 cm to 40 cm. No soil erosion was observed in this grove.

Winter season starts from end of October and lasts till March of the next year. Rainfall varies from heavy to moderate.



3.7.4 Forest Type

As per the Champion and Seth classification (1968), forests found in the sacred grove include the ***Type 9/C2 Assam Sub Tropical Pine Forest.***



3.7.5 Forest Cover

As per the India State of Forest Report-2021 published by the Forest Survey of India, Dehradun, forest cover in the *Khlo Blai Pohpuja* is as below:

Forest Cover	**Area (ha.)**	**% of total Area**
Very Dense Forest (> 70%)	0	0
Moderately Dense Forest (40 %-70 %)	0.40	62.61
Open Forest (10% - 40%)	0	0
Scrub Forest (<10%)	0	0
Non-Forest	0.24	37.39
Total	**0.64**	**100**

3.7.6 Flora and Fauna

The *Khlo Blai Pohpuja* is home to moderately dense forest of natural origin. *Caryota urens* and *Pasania fenestrata* are respectively 1st and 2nd dominant tree species. The forest is home to some rare, endangered and endemic plant species.

3.7.6.1: Floral species

Table 3.7.1: Trees found in *Khlo Blai Pohpuja*

Sl. No.	**Local Name**	**Botanical Name**	**Family**
1.	*Dieng tlai*	*Caryota urens*	*Arecaceae*
2.	*Dieng stap*	*Castanopsis armata*	*Fagaceae*
3.	*Dieng sning*	*Castanopsis tribuloides*	*Fagaceae*
4.	*Dieng lasaw*	*Eleocarpus robusta*	*Eleocarpaceae*
5.	*Dieng btah*	*Engelhardtia roxburghiana*	*Juglandaceae*
6.	*Dieng lba*	*Engelhardtia spicata*	*Juglandaceae*

7.	*Dieng sohum*	*Eugenia jambolana*	*Myrtaceae*
8.	*Dieng jri*	*Ficus hispida*	*Moraceae*
9.	*Dieng sohmanir khlaw*	*Gluta wallichii*	*Anacardiaceae*
10.	*Dieng lakhar*	*Macaranga denticulate*	*Euphorbiaceae*
11.	*Dieng sasei*	*Pasania fenestrate*	*Fagaceae*

Table 3.7.2: Shrubs found in *Khlo Blai Pohpuja*

Sl No.	Local Name	Botanical Name	Family
1.	*Dieng jalynsim*	*Debregeasia longifolia*	*Urticaceae*
2.	*Dieng shiah iong*	*Hiptage bengalensis*	*Malpighiaceae*
3.	*Sla jaremiong*	*Clerodendrum colabrooknum*	*Lamiaceae*
4.	*Dieng jaiur*	*Zanthoxylum armatum*	*Rutaceae*

Table 3.7.3: Herbs found in *Khlo Blai Pohpuja*

Sl No.	Local Name	Botanical Name	Family
1.	*Wang khlaw*	*Esculenta spp.*	*Araceae*
2.	*Bat eroplain*	*Inual cappa*	*Asteraceae*
3.	*Sying khlaw*	*Zingibr perpurum*	*Zingiberaceae*
4.	*Jalymoh*	*Polygonum Chinese*	*Polygonaceae*
5.	*Jalyngap iong*	*Inual cappa*	*Asteraceae*
6.	*Jangew*	*Emilia sonchifoli*	*Asteraceae*

Table 3.7.4: Climbers found in *Khlo Blai Pohpuja*

Sl No.	Local Name	Botanical Name	Family
1.	*Jyrmikhlaw*	*Mucuna macrocarpa*	*Leguminaceae*
2.	*Jyrmi shiahnepbah*	*Ampelocissus latifolia*	*Vitaceae*
3.	*Jyrmi ruin*	*Derris elleplica*	*Fabaceae*
4.	*Jyrmi batrifugi*	*Mikania micrantha*	*Asteraceae*

Table 3.7.5: Bamboos found in *Khlo Blai Pohpuja*

Sl No.	Local Name	Botanical Name	Family
1.	*Siej sylli*	*Melocanna baccifera*	*Poaceae*
2.	*Siej sken*	*Bamusa nidus*	*Poaceae*

Table 3.7.6: Ferns found in *Khlo Blai Pohpuja*

Sl No.	Local Name	Botanical Name	Family
1.	*Tyrkhang iong*	*Adiantum raddearnum*	*Pleridaceae*
2.	*Tyrkhang maw*	*Cyathea giganta*	*Cyatheaceae*
3.	*Tyrkhang khlaw*	*Asplinia nidus*	*Aspliniaceae*

Table 3.7.7: Grasses found in *Khlo Blai Pohpuja*

Sl No.	Local Name	Botanical Name	Family
1.	*Phlang thyrnia*	*Arendenella pumila*	*Poaceae*
2.	*Phlang tylli*	*Arendenella khasiana*	*Poaceae*
3.	*Phlang jem*	*Hedyotis uncinalla*	*Rubeaceae*
4.	*Phlang ot*	*Juncus effuses*	*Juncaceae*
5.	*Synsar*	*Thysanolaena maxima*	*Poaceae*

3.7.6.2 Faunal Species

No scientific study to assess presence and abundance of wildlife in *Khlo Blai Pohpuja* has been carried out so far. However, as per the local residents, presence of some wild animals such as jungle fowls and various species of amphibians, reptile, bird and mammal has been reported in this forest.

3.7.7 Growing Stock

As per the methodology described in Chapter-II, enumeration was carried out in 100% area of the forest as its area is less than 2 ha. All the trees, having girth (over bark) at breast height more than 30 cm, were enumerated by measuring the top height (in meters) and the girth at breast height (in centimetres). Data collected during the enumeration were entered in Sacred Groves Description Form and Plot Enumeration Form. During the enumeration within the grove, data were collected for 33 trees these include 10 *Caryota urens* (1st dominant), 6 *Pasania fenestrata* (2nddominant), 4 *Ficus hispida* (3rd dominant), and 13 trees of rest of species. Using the Local Volume Equations given in Chapter – II, girth class wise volume was calculated for each species for each of the 13 girth classes starting from 30-40 cm to 151 cm and above. Details of the same are given in the Table 3.7.8 below. As may be seen, total growing stock in this forest is 52.56 cubic metres.

Table 3.7.8: Species wise distribution of growing stock in different girth classes

(cum)

Girth class (cm)	*Caryota urens* (1st dominant)	*Pasania fenestrata* (2nd dominant)	*Ficus hispida* (3rd dominant)	Rest of the species	Total	% of total growing stock
30-40	0.00	0.02	0.00	0.09	**0.11**	**0.21**
41-50	0.19	0.00	0.00	0.00	**0.19**	**0.36**

51-60	0.31	0.00	0.00	0.00	**0.31**	**0.59**
61-70	0.74	0.42	0.00	0.45	**1.61**	**3.06**
71-80	0.46	0.00	0.00	1.22	**1.68**	**3.20**
81-90	0.79	0.00	1.49	0.00	**2.28**	**4.34**
91-100	0.00	1.00	0.00	0.00	**1.00**	**1.90**
101-110	0.00	1.23	0.00	0.00	**1.23**	**2.34**
111-120	2.82	1.48	0.00	2.93	**7.23**	**13.76**
121-130	0.00	1.75	0.00	3.24	**4.99**	**9.49**
131-140	0.00	0.00	0.00	1.83	**1.83**	**3.48**
141-150	0.00	2.35	2.35	0.00	**4.70**	**8.94**
151 & above	4.70	0.00	3.82	16.88	**25.40**	**48.33**
Total	**10.01**	**8.25**	**7.66**	**26.64**	**52.56**	**100.00**
% of total growing stock	19.04	15.70	14.57	50.68	100.00	

As may be seen, 19.04% of the total growing stock is contributed by the 1st dominant species (*Caryota urens)*. The 2nd dominant species (*Pasania fenestrata*) constitutes 15.70% of the total growing stock. Similarly, the 3rd dominant species *(Ficus hispida)* constitutes 14.57 % of the total growing stock., A major part of the growing stock (*i.e.* 50.68 %) is constituted by the rest of the species.

Figure 3.7.1:Girth class-wise distribution of growing stock

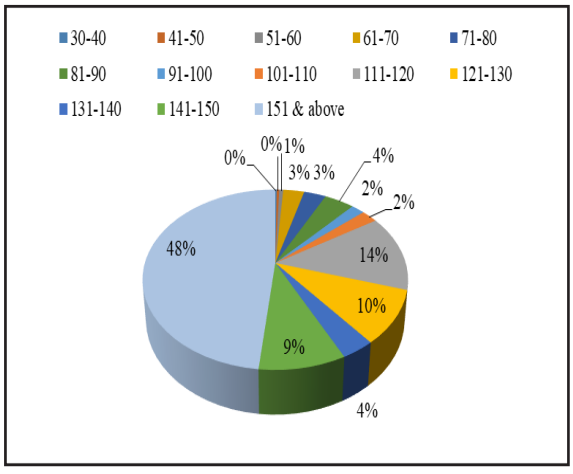


Figure 3.7.2: Species-wise distribution of growing stock

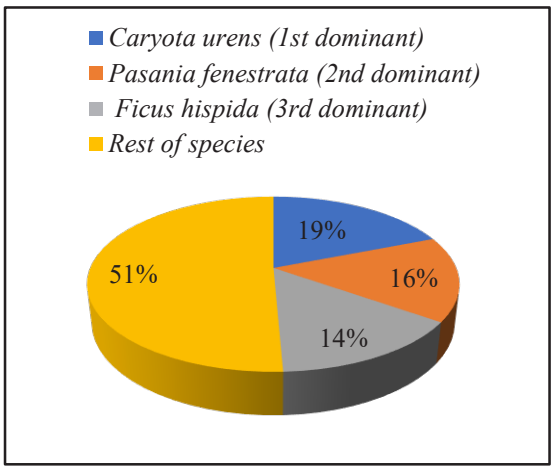


Figure 3.7.3:Girth class-wise distribution of growing stock

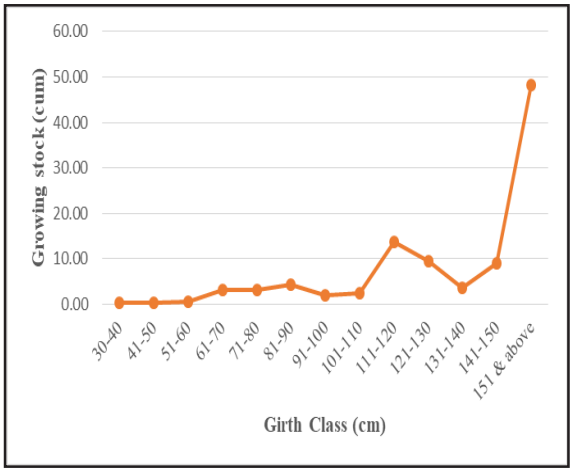


Figure 3.7.4: Overview of *Khlo Blai Pohpuja*



3.7.8 Number of Stems

Species-wise number of stems in each girth class are given in Table 3.7.9 below. As may be seen maximum numbers of stems are found in higher girth classes *i.e.* from 111-120 cm to 150 cm and above. It indicates a mature forest stand.

Table 3.7.9: Species-wise distribution of stems in different girth classes

(numbers of stems)

Girth class (cm)	*Caryota urens* (1st dominant)	*Pasania fenestrate* (2nd dominant)	*Ficus hispida* (3rd dominant)	Rest of the species	Total
30-40	0	1	0	1	**2**
41-50	1	0	0	0	**1**
51-60	1	0	0	0	**1**
61-70	2	0	0	1	**3**
71-80	1	0	0	2	**3**
81-90	1	0	2	0	**3**
91-100	0	1	0	0	**1**
101-110	0	1	0	0	**1**
111-120	2	1	0	2	**5**
121-130	0	1	0	2	**3**
131-140	0	0	0	1	**1**
141-150	0	1	1	0	**2**
151 & above	2	0	1	4	**7**
Total	**10**	**6**	**4**	**13**	**33**

Figure 3.7.5: Number of stems in different girth classes

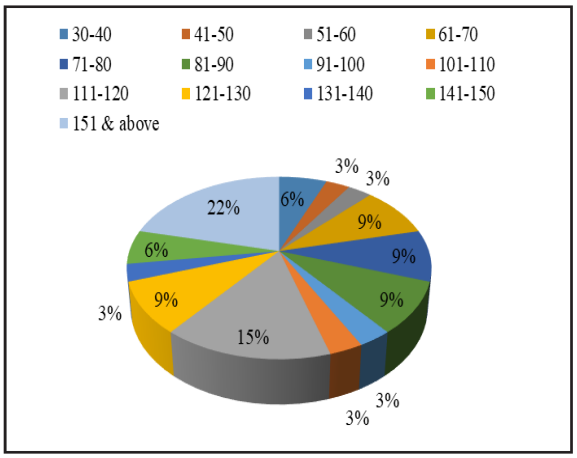


Figure 3.7.6: Species-wise distribution of stems

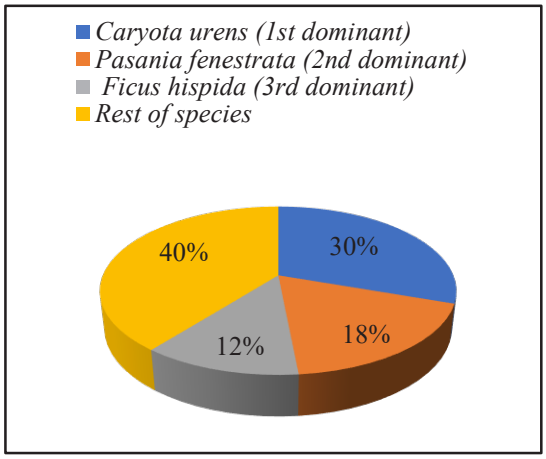


Figure 3.7.7:Number of stems in different girth classes



Figure 3.7.8: Inside view of *Khlo Blai Pohpuja*



3.7.9 Prescriptions for Future Management

3.7.9.1 Registration with the Jaintia Hills Autonomous District Council

The United Khasi-Jaintia Hills Autonomous District (Management and Control of Forests) Rules, 1960 provides for registration of each *Khlo Blai* located in areas falling under jurisdiction of the Jaintia Hills Autonomous District Council (JHADC). Though these rules came into force about 65 years ago, the *Khlo Blai Pohpuja* has not been registered with the JHADC. The Chief Forest Officer of the JHADC and the *Lyngdoh* of *Khlo Blai Pohpuja* may take immediate necessary actions, as provided in Chapter-I of the said rules to register the *Khlo Blai Pohpuja* with the JHADC. The same will accord legal recognition and protection from diversion for non-forestry purposes.

3.7.9.2 Notification as Community Reserve

Section 38C of the Wild Life (Protection) Act, 1972 provides that the State Government may, where the community or an individual has volunteered to conserve wild life and its habitat, declare any private or community land not comprised within a National Park, Wildlife Sanctuary or a Conservation Reserve, as a Community Reserve, for protecting fauna, flora and traditional or cultural conservation values and practices. Notification of an area as a Community Reserve accords it legal protection. It also makes it eligible to receive financial assistance under a Centrally Sponsored Scheme of 'Integrated Development of Wildlife Habitats'. The *Lyngdoh* of *Khlo Blai Pohpuja* and Wildlife Wing in the Forest and Environment Department, Government of Meghalaya may therefore take necessary actions for notification of the *Khlo Blai Pohpuja* as a Community Reserve.

3.7.9.3 Boundary Demarcation

Boundary of the *Khlo Blai Pohpuja* has not been physically demarcated on the ground. The same may result in intentional or unintentional encroachment. Since the grove is bounded in North-East and North-West by a village road and in the South and South-East by School building and private land it's boundary may be demarcated on the ground by erection of RCC boundary pillar and painting of rings on stem of trees standing along the boundary.

3.7.9.4 Fire Protection

As per the Meghalaya Forest Fire Information System, developed by the North Eastern Space Application Centre (NESAC), during a period of 22 years (2002 -2024) zero fire incident has occurred in the *Khlo Blai Pohpuja*. As per the said system Meghalaya Forest Fire Information System a major part of the *Khlo Blai Pohpuja* is hight to moderately vulnerable to forest fires. However, as per the said information system, a major part of *Khlo Blai Pohpuja* is less prone to forest fires. However, to prevent damage to the *Khlo Blai Pohpuja* from accidental forest fires, measures such as creation and periodic cleaning of fire line along the periphery and at critical locations within the *Khlo Blai Pohpuja* and engagement of fire watchers during the critical months may be taken.

3.7.9.5 Construction of Soil Moisture Conservation and Water Harvesting Structures

To prevent and minimise soil erosion and to improve moisture regime, water harvesting structures such as check dam, contour trench, may be constructed at suitable locations in the *Khlo Blai Pohpuja.*

3.7.9.6 Creation of Eco-Tourism Facilities

To create awareness about rich biodiversity of the *Khlo Blai Pohpuja* and also to create livelihood opportunities for local residents, eco-tourism facilities such as rain shelter cum view point, footpath/ walking trail, sign board, washrooms *etc.* may be built to attract tourists.

3.7.9.7 Restocking of Degraded Areas

Efforts may be made to restock degraded patches in *Khlo Blai Pohpuja* by assisting and promoting natural regeneration of native species. Areas which can not be restocked by natural regeneration alone may be restocked by planting seedlings of native species.

3.7.9.8 Formulation of A Proposal and Registration Thereof on Carbon Registry to Earn Carbon Credits

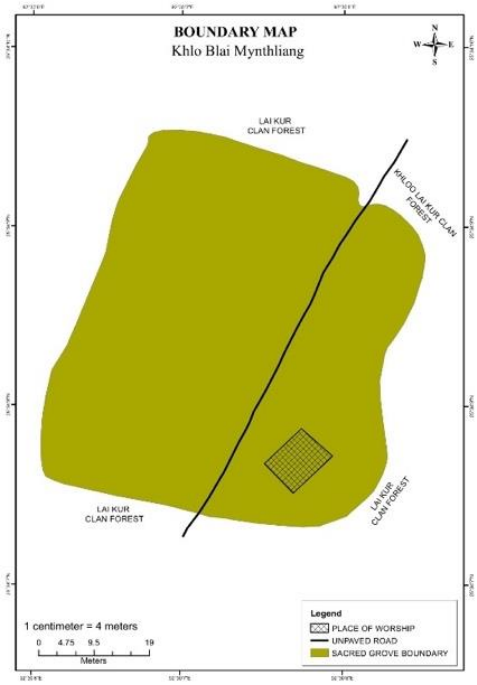
To reward the local communities for their efforts in conservation and protection of *Khlo Blai Pohpuja* for centuries, a proposal may be formulated and registered on an appropriate carbon registry to earn carbon credits for measures to be taken by the local communities for better protection and conservation of the *Khlo Blai Pohpuja*.

3.7.9.9 Awareness Campaign

The *Khlo Blai Pohpuja* has been protected by the *Pohpujai Lyngdoh* for centuries for religious, conservation and cultural beliefs. Since the grove is located in the heart of the *Raliang* village, therefore this need to be rejuvenated and strengthened by creating awareness among the local communities and grassroot level institutions about cultural, heritage and economic importance of sacred groves and other community owned forests.

3.8. *KHLO BLAI MYNTHIANG*

3.8.1 Location



Khlo Blai Mynthiang is situated in West Jaintia Hills District of Meghalaya at *Niawkmai* village in *Elaka Raliang* Daloiship. It covers an area of 0.33 ha and lies between 25° 34. 7" to 25° 34′ 9 N latitude and 92° 30.6″ to 92° 30.8″ E Longitude at an altitude of 1012 m above mean sea level. It is bounded in the North, East, South and West by *Lai Kur* Clan forest, the grove is accessible by road from *Jowai* to *Raliang* village which is about 50 km away and followed by motorable village road for 1 km distance.

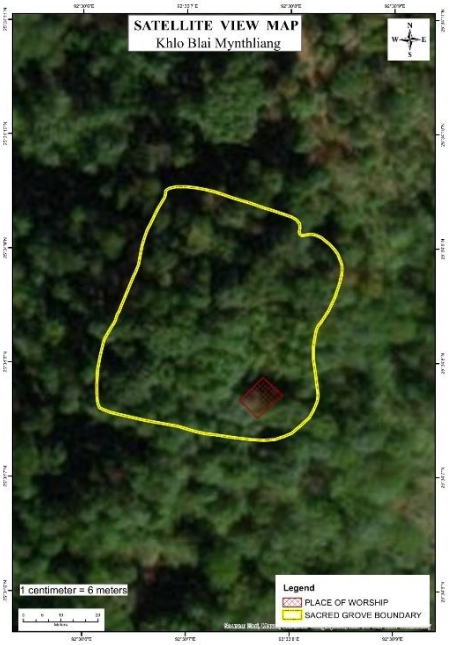
3.8.2 Brief History

Khlo Blai Mynthiang has been in existence for several centuries. Since the majority of the villagers are *Niam Tre* believers, the religious significance of the grove has not diminished as offerings and prayers and religious rituals such as annual animal sacrifice *etc.* are still performed in this grove. It has been managed and controlled by the Lyngdoh of *Niawkmai*. Due its spiritual significance, the grove is considered to house various deities and thus trespassing is strictly prohibited. Felling of trees, hunting and poaching, grazing is also strictly prohibited. Biotic pressures such as encroachments, hunting, poaching and illegal felling of trees are found to be absent from this forest.

3.8.3 Geography and Climate

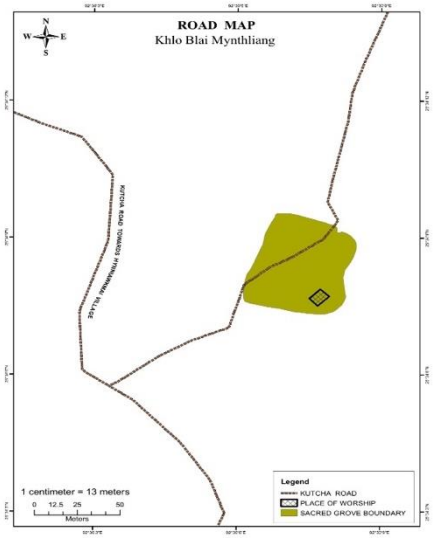
Topography of the grove is gentle rolling in nature with slope varying from 0.19° to 28°. Major part of the *Khlo Blai Mynthiang* falls in the Southern and South-East aspects. Soil texture is loamy in nature with no coarse fragments. Soil consistency is slightly compact. Soil is black in colour and the soil is moderate in depth ranging from 20 cm to 40 cm. No soil erosion has been observed in the grove.

Winter season starts from end of October and last still March of the next year. Rainfall varies from heavy to moderate and there is hardly any month without rain.



3.8.4 Forest Type

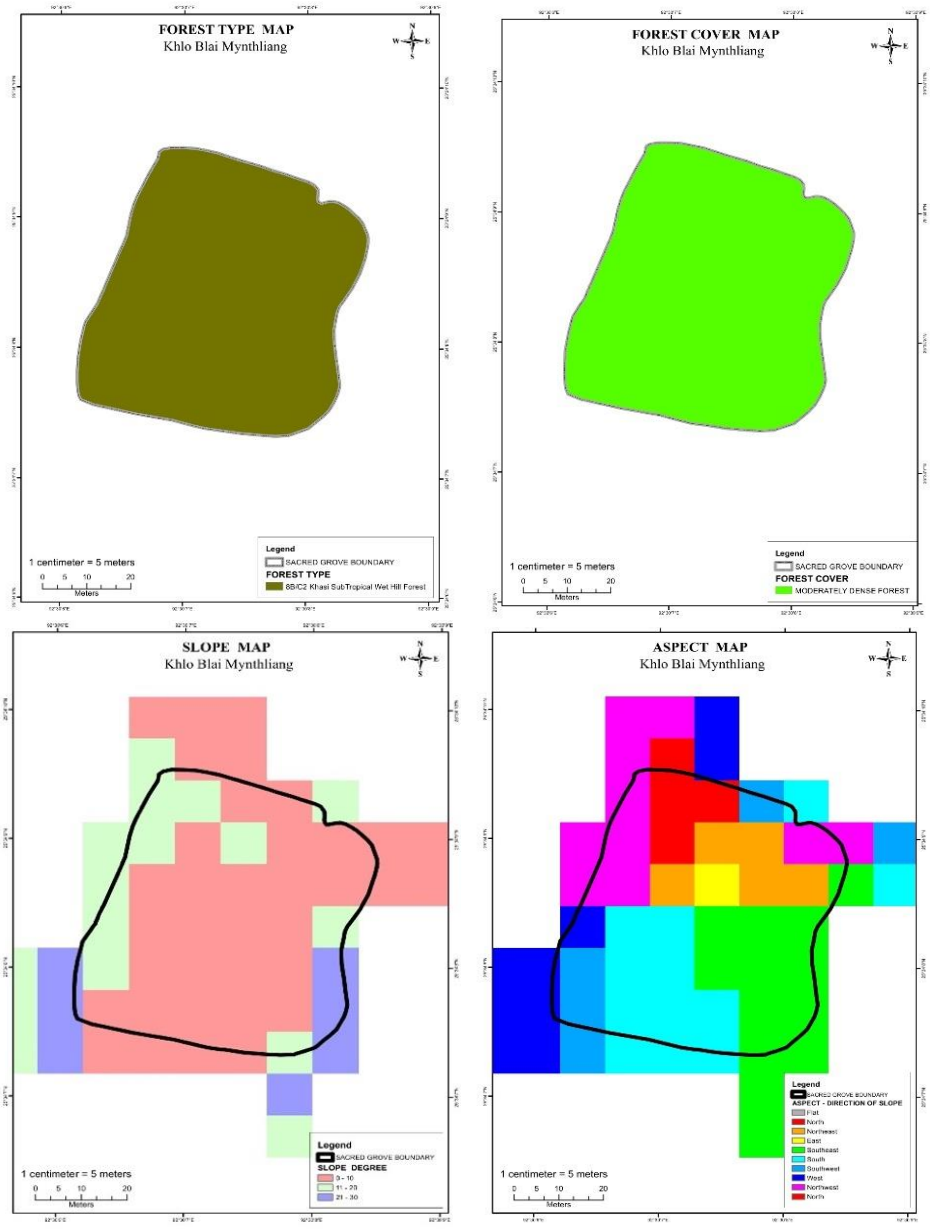
As per the Champion and Seth classification (1968), forests found in the sacred grove are of the ***Type 8B/C2 Khasi Sub Tropical Wet Hill Forest.***



3.8.5 Forest Cover

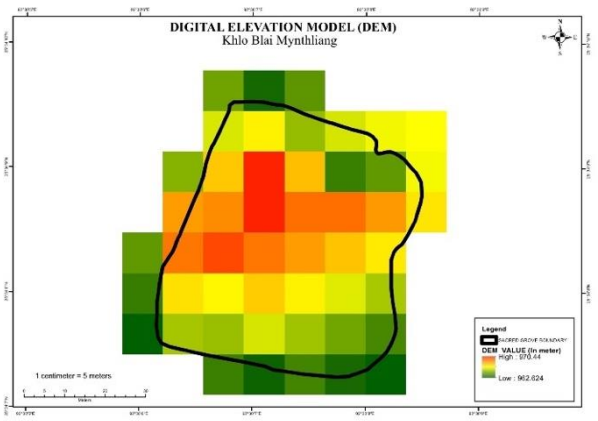
As per the India State of Forest Report-2021 published by the Forest Survey of India, Dehradun, forest cover in the *Khlo Blai Mynthiang* is as below:

Forest Cover	Area (ha.)	% of total Area
Very Dense Forest (> 70%)	0	0
Moderately Dense Forest (40 %-70 %)	0.33	100
Open Forest (10% - 40%)	0	0
Scrub Forest (<10%)	0	0
Non-Forest	0	0
Total	**0.33**	**100**


FOREST TYPE MAP
Khlo Blai Mynthliang
1 centimeter = 5 meters
Legend
SACRED GROVE BOUNDARY
FOREST TYPE
FOREST COVER MAP
Khlo Blai Mynthliang
1 centimeter = 5 meters
Legend
SACRED GROVE BOUNDARY
FOREST COVER
MODERATELY DENSE FOREST
SLOPE MAP
Khlo Blai Mynthliang
1 centimeter = 5 meters
Legend
SACRED GROVE BOUNDARY
SLOPE DEGREE
ASPECT MAP
Khlo Blai Mynthliang
1 centimeter = 5 meters
Legend
ASPECT - DIRECTION OF SLOPE
Flat
North
Northeast
East
Southeast
South
Southwest
West
Northwest
North

3.8.6 Flora and Fauna

The *Khlo Blai Mynthiang* is home to moderately dense forest of natural origin. *Castanopsis hystrix* and *Castanopsis indica* are respectively 1st and 2nd dominant tree species. The forest is home to some rare, endangered and endemic plant species.



3.8.6.1: Floral species

Table 3.8.1: Trees found in *Khlo Blai Mynthiang*

Sl. No.	Local Name	Botanical Name	Family
1.	*Dieng kreit*	*Albizia lebbeck*	*Mimosaceae*
2.	*Dieng shyrmi*	*Apodytes dimidiata*	*Metteniusaceae*
3.	*Dieng latymphu*	*Aralia armata*	*Arialiaceae*
4.	*Dieng lakhiat*	*Callicaspa arbarea*	*Verbanaceae*
5.	*Dieng sning*	*Castanopsis armata*	*Fagaceae*
6.	*Dieng sohot*	*Castanopsis indica*	*Fagaceae*
7.	*Dieng stap*	*Castanopsis hystrix*	*Fagaceae*
8.	*Dieng basier*	*Ehretia acuminata*	*Boraginaceae*
9.	*Dieng sohkhyllam*	*Elaeocarpus robustus*	*Elaeocarpaceae*
10.	*Dieng ruin*	*Eleocarpus prunifolius*	*Asteraceae*
11.	*Dieng sohmylleng*	*Emblica officinalis*	*Euphorbiaceae*
12.	*Dieng tingiong*	*Engelhardia roxburghiana*	*Juglandaceae*
13.	*Dieng btah*	*Engelhardtia roxburghiana*	*Juglandaceae*
14.	*Dieng song*	*Erythrina indica*	*Fabaceae*
15.	*Dieng jem*	*Glochidiona cuminatum*	*Phyllanthaceae*
16.	*Dieng sohmeblang*	*Grewia abutilifolia*	*Tiliaceae*
17.	*Dieng lasnam*	*Knema agustfolia*	*Myristicaceae*
18.	*Dieng thyrma*	*Maesa chisia*	*Primulaceae*
19.	*Dieng sohpingiong*	*Mangifera sylvatica*	*Anacardiaceae*
20.	*Dieng lari*	*Magnolia liliiflora*	*Magnoliaceae*
21.	*Dieng shap (bausin)/rai*	*Michelia champaca*	*Magnoliaceae*
22.	*Dieng btah*	*Michelia spp*	*Magnoliaceae*
23.	*Dieng sohrei/stem*	*Morinda angustifolia*	*Rubiaceae*
24.	*Dieng sasei*	*Pasania fenestrata*	*Fagaceae*
25.	*Dieng rtiang*	*Quercus serata*	*Fagaceae*

26.	*Dieng kain*	*Rhus succedanea*	*Anacardiaceae*
27.	*Dieng sohkyndid*	*Sauropus androgynus*	*Phyllanthaceae*
28.	*Dieng ngan*	*Shcima khasiana*	*Theaceae*
29.	*Dieng sohlait*	*Spondias axillaris*	*Anacardiaceae*
30.	*Dieng soheitblang*	*Styrax serrulatus*	*Styracaceae*

Table 3.8.2: Shrubs found in *Khlo Blai Mynthiang*

Sl No.	Local Name	Botanical Name	Family
1.	*Dieng jalynsim*	*Debregeasia longifolia*	*Urticaceae*
2.	*Dieng tyrnem synrang*	*Camellia caudata*	*Theaceae*
3.	*Dieng soh pyrsit*	*Eurya acuminata*	*Theaceae*
4.	*Dieng rnong*	*Moleonia pycenophylla*	*berberidaceae*
5.	*Sla jarem iong*	*Clerodendrum colebrookianum*	*Lamiaceae*

Table 3.8.3: Herbs found in *Khlo Blai Mynthiang*

Sl No.	Local Name	Botanical Name	Family
1.	*Synrai khlaw*	*Alpinia spp.*	*Gingiberaceae*
2.	*Syieng khlaw*	*Zengiber purpureum*	*Zingiberaceae*
3.	*Jajew khlaw*	*Begonia roxburghii*	*Begoniaceae*
4.	*Phud wang*	*Colocasia spp.*	*Araceae*
5.	*Wang khlaw*	*Colocasia Esculenta*	*Araceae*
6.	*Bat eroplain*	*Inula cappa*	*Asteraceae*

Table 3.8.4: Climbers found in *Khlo Blai Mynthiang*

Sl No.	Local Name	Botanical Name	Family
1.	*Jermi siah sohkrot*	*Smilax glabra*	*Smilacaceae*
2.	*Jermi ruin*	*Derris elliptica*	*Fabaceae*
3.	*Jermi pew shrieh*	*Hedera nepalensis*	*Araliaceae*
4.	*Jyrni pur*	*Cocculus hirsutus*	*Menispermaceae*
5.	*Jermi Siah nepbah*	*Ampelocissus latifolia*	*Vitaceae*

Table 3.8.5: Grasses found in *Khlo Blai Mynthiang*

Sl No.	Local Name	Botanical Name	Family
1.	*Phlang tylli*	*Arundinella khasiana*	*Poaceae*
2.	*Phlang thyrnia*	*Arundinella pumila*	*Poaceae*
3.	*Phlang ot*	*Juncus effusus*	*Juncaceae*
4.	*Synsar*	*Thysanolaena maxima*	*Poaceae*

Table 3.8.6: Bamboos found in *Khlo Blai Mynthiang*

Sl No.	Local Name	Botanical Name	Family
1.	*Siej Shken*	*Bambusa nidus*	Poaceae
2.	*Siej skong*	*Bambusa tulda*	Poaceae

3.8.6.2 Faunal Species

No scientific study to assess presence and abundance of wildlife in *Khlo Blai Mynthiang* has been carried out so far. However, as per the local residents, presence of some wild amphibians, reptiles, birds and mammals has been reported in this forest.

3.8.7 Growing Stock:

As per the methodology described in Chapter-II, enumeration was carried out in 100% area of the forest as its area is less than 2 ha. All the trees, having girth (over bark) at breast height more than 30 cm, were enumerated by measuring the top height (in meters) and the girth (in centimetres) at breast height. Data collected during the enumeration were entered in Sacred Groves Description Form and Plot Enumeration Form. During the enumeration within the grove, data was collected for 159 trees consisting of 40 *Castanopsis hystrix* (1st dominant), 20 *Castanopsis indica* (2nddominant), 13 *Schima khasiana* (3rd dominant), and 159 rest of species. Using the Local Volume Equations given in Chapter –II, girth class wise volume was calculated for each species for each of the 13 girth classes starting from 30-40 cm to 151 cm and above. Details of the same are given in the Table 3.8.7 below. As may be seen, total growing stock in this forest is 155.7 cubic metres.

Table 3.8.7: Species wise distribution of growing stock in different girth classes in the entire forest *(cum)*

Girth Class (cm)	*Castanopsis lystric* (1st dominant)	*Castanopsis indica* (2nd dominant)	*Shcima khasiana* (3rd dominant)	Rest of the species	Total	% of total growing stock
30-40	0.29	0.07	0.00	0.57	**0.93**	0.60
41-50	0.35	0.00	0.34	1.49	**2.18**	1.40
51-60	1.31	0.00	0.21	2.02	**3.54**	2.27
61-70	1.60	0.70	0.00	6.43	**8.73**	5.61
71-80	2.11	0.00	0.46	4.24	**6.81**	4.37
81-90	2.97	2.21	0.65	4.54	**10.37**	6.66
91-100	2.62	2.75	0.00	6.20	**11.57**	7.43
101-110	5.44	4.72	0.00	6.81	**16.97**	10.90
111-120	1.25	2.80	2.67	6.85	**13.57**	8.72
121-130	3.27	5.01	0.00	0.00	**8.28**	5.32
131-140	0.00	0.00	0.00	1.98	**1.98**	1.27

141-150	0.00	2.19	0.00	2.19	**4.38**	2.81
151 & above	27.32	0.00	24.62	14.44	**66.38**	42.64
Total	**48.53**	**20.45**	**28.95**	**57.76**	**155.69**	100.00
% of total growing stock	**31.17**	**13.14**	**18.59**	**37.10**	**100.00**	

As may be seen,31.17%, the total growing stock is contributed by the 1st dominant species (*Castanopsis hystrix)*. The 2nd dominant species (*Castanopsis indica*) constitutes 13.14% of the total growing stock. Similarly, the 3rd dominant species *(Schima khasiana)* is 9.07 % of the total growing stock., A major part of the growing stock (*i.e*.37.10 %) is constituted by the rest of the species.

Figure 3.8.1:Girth class-wise distribution of growing stock

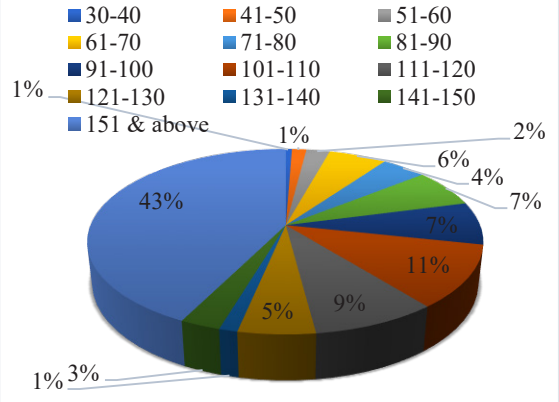


Figure 3.8.2: Species-wise distribution of growing stock

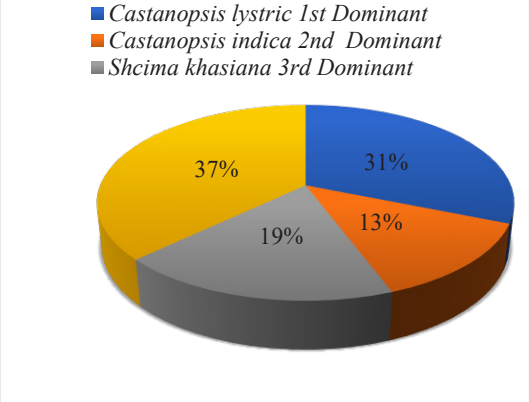


Figure 3.8.3:Girth class-wise distribution of growing

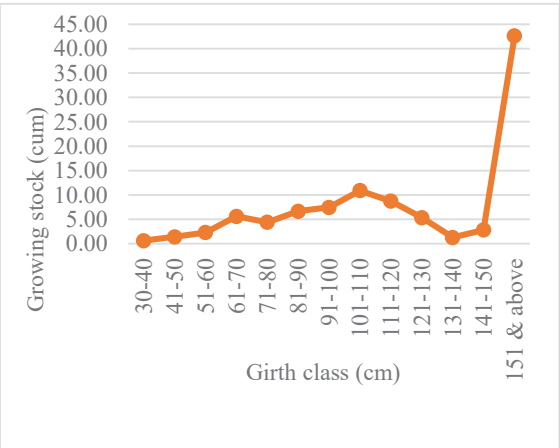


Figure 3.8.8: Inside view of *Khlo Blai Mynthiang*



3.8.8 Number of Stems

Species-wise number of stems in each girth class are given in Table 3.8.8 below. As may be seen maximum numbers of stems are found in mid girth classes *i.e.* from 61-70 cm to 101-110 cm.

Table 3.8.8: Species-wise distribution of stems in different girth classes in the entire forest

(numbers of stems)

Girth Class (cm)	*Castanopsis lystric* (1st dominant)	*Castanopsis indica* (2nd dominant)	*Shcima khasiana* (3rd dominant)	Rest of the species	Total
30-40	4	2	0	15	21
41-50	2	0	2	10	14
51-60	5	0	1	8	14
61-70	4	2	0	16	22
71-80	4	0	1	8	13
81-90	4	3	1	6	14
91-100	3	3	0	7	13
101-110	5	4	0	6	15
111-120	1	2	2	5	10
121-130	2	3	0	0	5
131-140	0	0	0	1	1
141-150	0	1	0	1	2
151 & above	6	0	6	3	15
Total	**40**	**20**	**13**	**86**	**159**

Figure 3.8.5:Number of stems in different girth classes

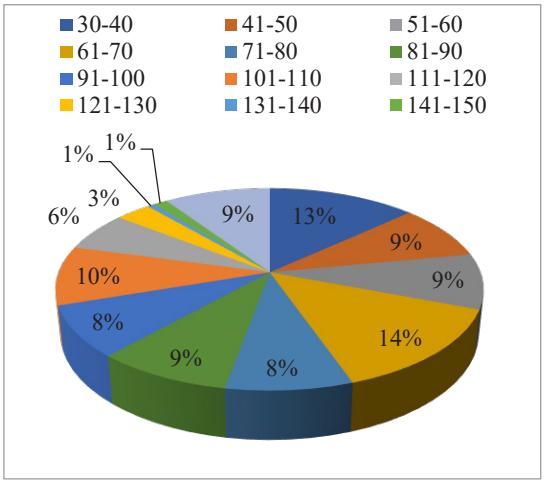


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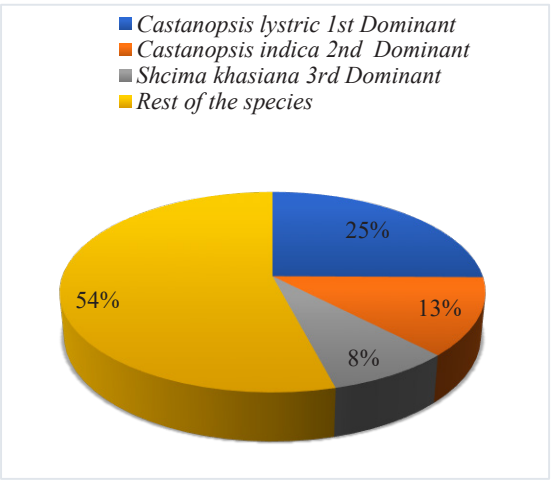


Figure 3.8.7:Number of stems in different girth classes

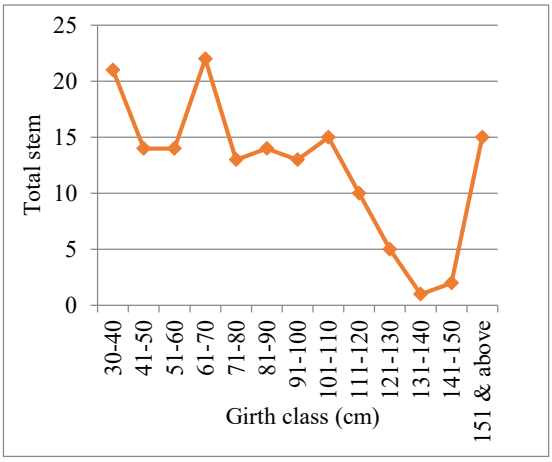


Figure 3.8.8: Overview of *Khlo Blai Mynthiang*



3.8.9 Prescriptions for Future Management

3.8.9.1 Registration with the Jaintia Hills Autonomous District Council

The United Khasi-Jaintia Hills Autonomous District (Management and Control of Forests) Rules, 1960 provides for registration of each *Khlo Blai* located in areas falling under jurisdiction of the Jaintia Hills Autonomous District Council (JHADC). Though these rules came into force about 65 years ago, the *Khlo Blai Mynthiang* has not been registered with the JHADC. The Chief Forest Officer of the JHADC and the *Niawkmai Lyngdoh* of *Khlo Blai Mynthiang* may take immediate necessary actions, as provided in Chapter-I of the said rules to register the *Khlo Blai Mynthiang* with the JHADC. The same will accord legal recognition and protection from diversion for non-forestry purposes.

3.8.9.2 Notification as Community Reserve

Section 38C of the Wild Life (Protection) Act, 1972 provides that the State Government may, where the community or an individual has volunteered to conserve wild life and its habitat, declare any private or community land not comprised within a National Park, Wildlife Sanctuary or a Conservation Reserve, as a Community Reserve, for protecting fauna, flora and traditional or cultural conservation values and practices. Notification of an area as a Community Reserve accords it legal protection. It also makes it eligible to receive financial assistance under a Centrally Sponsored Scheme of 'Integrated Development of Wildlife Habitats'. The *Niawkmai Lyngdoh* of *Khlo Blai Mynthiang* and Wildlife Wing in the Forest and Environment Department, Government of Meghalaya may therefore take necessary actions for notification of the *Khlo Blai Mynthiang* as a Community Reserve.

3.8.9.3 Boundary Demarcation

Boundary of the *Khlo Blai Mynthiang* has not been physically demarcated on the ground. The same may result in intentional or unintentional encroachment. This forest may be demarcated by erection of RCC boundary pillar and painting of rings on stem of trees standing on the boundary.

3.8.9.4 Fire Protection

As per the Meghalaya Forest Fire Information System, during a period of 22 years (2002 -2024) zero fire incident has occurred in the *Khlo Blai Mynthiang*. As per the Meghalaya Forest Fire Information System developed by the North Eastern Space Application Centre (NESAC) a major part of the *Khlo Blai Mynthiang* is highly vulnerable to forest fires. However, as per the said information system, a major part of *Khlo Blai Mynthiang* has 'Low' proneness to forest fires. To prevent damage to the *Khlo Blai Mynthiang* from accidental forest fires, measures such as creation and periodic cleaning of fire line along the periphery and at critical locations within the *Khlo Blai Mynthiang* and engagement of fire watchers during the critical months may be taken.

3.8.9.5 Construction of Soil Moisture Conservation and Water Harvesting Structures

No stream flows through *Khlo Blai Mynthiang*. To prevent and minimise soil erosion and to improve moisture regime, water harvesting structures such as check dam, contour trench, may be constructed at suitable locations in the *Khlo Blai Mynthiang.*

3.8.9.6 Creation of Eco-Tourism Facilities

To create awareness about rich biodiversity of the *Khlo Blai Mynthiang* and also to create livelihood opportunities for local residents, eco-tourism facilities such as rain shelter cum view point, footpath/ walking trail, sign board, washrooms *etc.* may be built to attract tourists.

3.8.9.7 Restocking of Degraded Areas

Efforts may be made to restock the open degraded patches in *Khlo Blai Mynthiang* by assisting and promoting natural regeneration of native species. In areas where natural regeneration is not feasible, artificial regeneration by planting seedlings of native species should be undertaken.

3.8.9.8 Formulation of A Proposal and Registration Thereof on Carbon Registry to Earn Carbon Credits

To reward the local communities for their efforts in conservation and protection of *Khlo Blai Mynthiang* for centuries, a proposal may be formulated and registered on an appropriate carbon registry to earn carbon credits for measures to be taken by the local communities for better protection and conservation of the *Khlo Blai Mynthiang*.

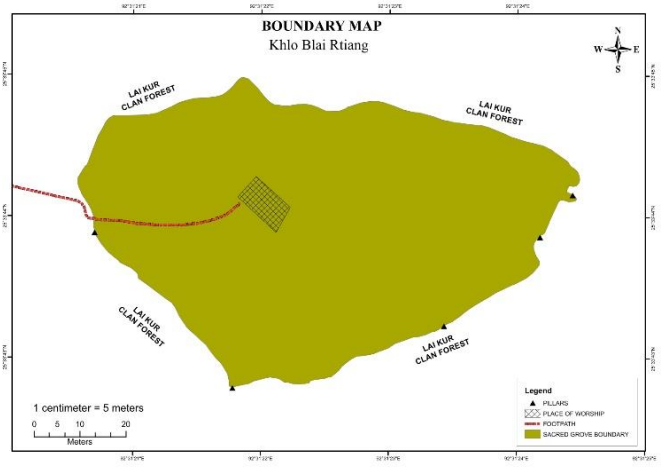
3.8.9.9 Awareness Campaign

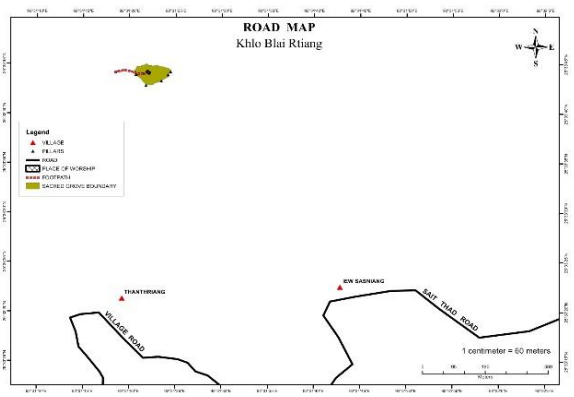
The *Khlo Blai Mynthiang* has been protected by the *Niawkmai Lyngdoh* for centuries for spiritual, conservation and cultural beliefs. Public awareness can be taken up in the area for the local and non-local individual to augment the future environmental protection endeavours. Special programme for school children should be conducted for long term conservation of forests.

3.9. *KHLO BLAI RTIANG*

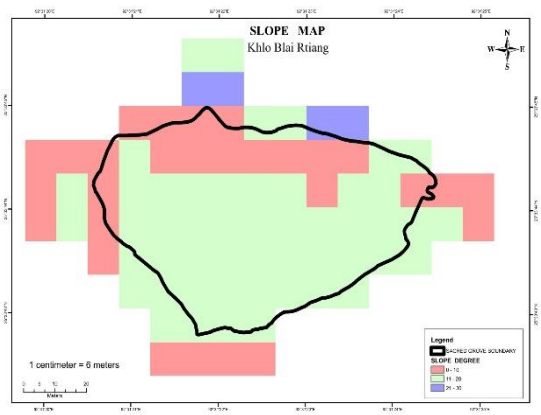
3.9.1 Location

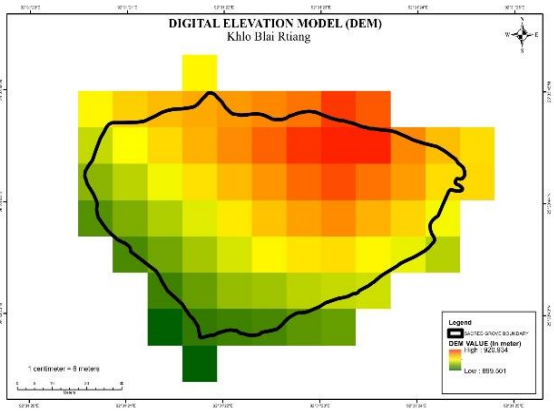
Khlo Blai Rtiang is situated in West Jaintia Hills District of Meghalaya at *Niawkmai* village *Elaka Raliang Dolloiship*. It covers an area of 0.47 ha and lies between 25° 33′43" to 25° 33′ 45 N latitude and 92° 31′ 20″ to 92° 31′ 25″ E longitude at an altitude of 964 m above mean sea level. It is bounded in the North, East and South West by *Lai Kur* Clan Forest. The grove is accessible by road from *Jowai* to *Niawkmai* village which is about 70 km away, it is followed by Motorable *Kutcha* Road for 1.5 Km.





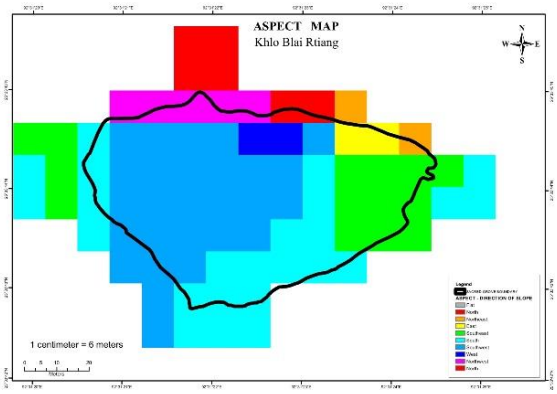






3.9.2 Brief History

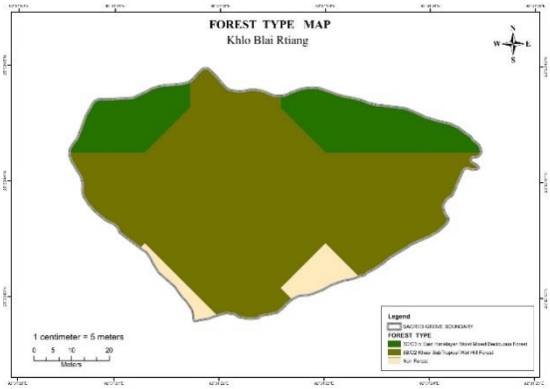
Khlo Blai Rtiang has been in existence for several centuries. Religious rituals in the form of animal sacrifice are still performed every year by the *Lyngdoh* of *Sein Raij Niawkmai* to appease the *Basa* (Deiti) who in-turn bless and protect the Kingdom and its subject. The area is considered as a sanctum sanctorum. Entry for the general public is prohibited. Entry by permission requires the offering of prayer to deities by the *Lyngdoh* of *Sein Raij*. Felling of trees, hunting, poaching and grazing are strictly prohibited.



Biotic pressures such as encroachments, hunting, poaching and illegal felling of trees are found to be absent in this forest.

3.9.3 Geography and Climate

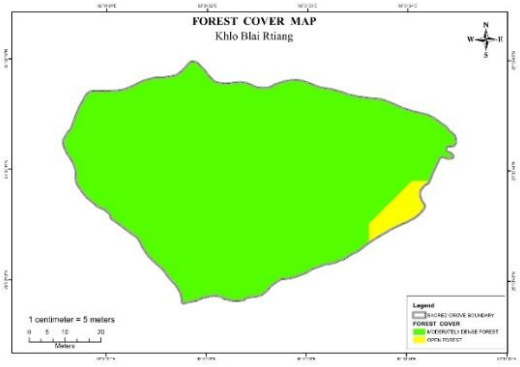
Topography of the grove is gentle rolling in nature which slope varying 0.20° to 27°. Major part of the *Khlo Blai Rtiang* falls under the South-west and Southern aspects. Soil texture is loamy in nature with slight compact in consistency. The colour of the Soil is brown. Soil depth is shallow ranging from 15 cm to 30 cm with no coarse fragments.



Niawkmai village has the hotter weather compared to *Jowai* with the average minimum temperature is 8° C and maximum is 25° C. The rainfall varies from heavy to moderate. Spring Season is from March to May while the monsoon season starts from May and end around October and Winter season ends in February.

3.9.4 Forest Type

As per the Champion and Seth classification (1968), forests found in the sacred grove are of the ***Type 8B/C2 Khasi Sub Tropical Wet Hill Forest*** and ***3C/C3b East Himalayan Moist mixed deciduous forest.***



3.9.5 Forest Cover

As per the India State of Forest Report-2021 published by the Forest Survey of India, Dehradun, forest cover in the *Khlo Blai Rtiang* is as below:

Forest Cover	**Area (ha.)**	**% of total Area**
Very Dense Forest (> 70%)	0	0
Moderately Dense Forest (40 %-70 %)	0.46	98.41
Open Forest (10% - 40%)	0.01	2.65
Scrub Forest (<10%)	0	0
Non-Forest	0	0
Total	**0.47**	**100**

3.9.6 Flora and Fauna

The *Khlo Blai Rtiang* is home of moderately dense forest of natural origin. *Quercus serrata species* and *Albizzia lebbeck* are respectively 1st and 2nd dominant tree species. The forest is home to some rare, endangered and endemic plant species.

3.9.6.1 Floral species

Table 3.9.1: Trees found in *Khlo Blai Rtiang*

Sl. No.	**Local Name**	**Botanical Name**	**Family**
1.	*Dieng kreit*	*Albizia lebbeck*	*Fabaceae*
2.	*Dieng sning*	*Castanopsis tribuloides*	*Fagaceae*
3.	*Dieng sohmylleng*	*Emblica officinalis*	*Phyllanthaceae*
4.	*Dieng jri*	*Ficus elastica indica*	*Moraceae*
5.	*Dieng jem*	*Glochidion velutinum*	*Phyllanthaceae*
6.	*Dieng phing*	*Gmelina arborea*	*Lamiaceae*
7.	*Dieng sohmeblang*	*Grewia abutilifolia*	*Malvaceae*
8.	*Dieng sohsnam*	*Haematocarpus validus*	*Menispermaceae*
9.	*Dieng sohsyrted*	*Itea chinensis*	*Iteaceae*
10.	*Dieng lakhoh*	*Mallostus alba*	*Fabaceae*
11.	*Dieng rai/lari*	*Michelia champaca*	*Magnoliaceae*

12.	*Dieng shyiap*	*Minusop elengi*	*Sapotaceae*
13.	*Dieng sohliya*	*Myrica nagi*	*Myricaceae*
14.	*Dieng sasei*	*Pasania fenestrata*	*Fagaceae*
15.	*Dieng kseh*	*Pinus kesiya*	*Pineaceae*
16.	*Dieng lakba*	*Polygala arillata*	*Polygalaceae*
17.	*Dieng rtiang*	*Quercus serrata*	*Fagaceae*
18.	*Dieng ngan*	*Schima khasiana*	*Theaceae*
19.	*Dieng tluh*	*Sterculia villosa*	*Malvaceae*
20.	*Dieng psiar*	*Stereospermum chelonoides*	*Bignoniaceae*
20.	*Dieng bti*	*Toona Ciliata*	*Meliaceae*

Table 3.9.2: Shrubs found in *Khlo Blai Rtiang*

Sl No.	Local Name	Botanical Name	Family
1.	*Japung*	*Phrangmites skarka*	*Poaceae*
2.	*Jalynsim*	*Dobrigresia longifolia*	*Urticaceae*
3.	*Dieng tyrnem*	*Camellia kissi*	*Theaceae*
4.	*Dieng tyrnem synrang*	*Camellia caduca*	*Theaceae*

Table 3.9.3: Herbs found in *Khlo Blai Ratiang*

Sl No.	Local Name	Botanical Name	Family
1.	*Jalymnoh*	*Polygonum chinense*	*Polygonaceae*
2.	*Bat eroplain*	*Inual cappa*	*Asteraceae*
3.	*Jamiaw*	*Var prostrate*	*Amaranthaceae*
4.	*Jalyngap iong*	*Inual cappa*	*Asteraceae*
5.	*Jangew*	*Emilia sonchifoli*	*Asteraceae*

Table 3.9.4: Climbers found in *Khlo Blai Rtiang*

Sl No.	Local Name	Botanical Name	Family
1.	*Jyrmi khlaw*	*Mucuna macrocarpa*	*Leguminaceae*

2.	*Jyrmi shiahnepbah*	*Ampelocissus latifolia*	*Vitaceae*
3.	*Jyrmi ruin*	*Derris elleplica*	*Fabaceae*

Table 3.9.5: Bamboos found in *Khlo Blai Rtiang*

Sl No.	Local Name	Botanical Name	Family
1.	*Siejsylli*	*Melocannabaccifera*	*Poaceae*
2.	*Siej sken*	*Bamusa nidus*	*Poaceae*
3.	*Siej skong*	*Bambusa tulda*	*Poaceae*

Table 3.9.6: Ferns found in *Khlo Blai Rtiang*

Sl No.	Local Name	Botanical Name	Family
1.	*Tyrkhang iong*	*Adiantum raddearnum*	*Pleridaceae*
2.	*Tyrkhang maw*	*Cyathea giganta*	*Cyatheaceae*
3.	*Tyrkhang khlaw*	*Asplinia nidus*	*Aspliniaceae*

Table 3.9.7: Grasses found in *Khlo Blai Rtiang*

Sl No.	Local Name	Botanical Name	Family
1.	*Phlang thyrnia*	*Arendenella pumila*	*Poaceae*
2.	*Phlang tylli*	*Arendenella khasiana*	*Poaceae*
3.	*Phlang ot*	*Juncus effusus*	*Juncaceae*
4.	*Synsar*	*Thysanolaena maxima*	*Poaceae*

3.9.6.2 Faunal Species

No scientific study to assess presence and abundance of wildlife in *Khlo Blai Rtiang* has been carried out so far. However, as per the local residents, presence of some wild animals such as jungle fowls, pangolin, and some animals of amphibians, reptile, bird and mammal classes has been reported in this forest.

3.9.7 Growing Stock

As per the methodology described in Chapter-II, enumeration was carried out in 100% area of the forest as its area is less than 2 ha. All trees, having girth (over bark) at breast height more than 30 cm, were enumerated by measuring the top height (in meters) and the girth at breast height (in centimetres). Data collected during the enumeration were entered in Sacred Groves Description Form and Plot Enumeration Form. During the enumeration within the grove, data were collected for 200 trees consisting of 106 *Quercus serrata* (1st dominant), 23 *Albizzia lebbeck* (2nddominant), 15 *Schima khasiana* (3rd dominant), and 56 trees of rest of species. Using the Local Volume Equations given in

Chapter –II, girth class wise volume was calculated for each species for each of the 13 girth classes starting from 30-40 cm to 151 cm and above. Details of the same are given in the Table 3.9.8 below. As may be seen, total growing stock in this forest is 110.99 cubic metres.

Table 3.9.8: Species wise distribution of growing stock in different girth classes

(cum)

Girth class (cm)	***Quercus serrata* (1st dominant)**	***Albizzia lebbeck* (2nd dominant)**	***Schima khasiana* (3rd dominant)**	**Rest of species**	**Total**	**% of total growing stock**
30-40	0.22	1.20	0.17	0.63	**2.22**	**2.00**
41-50	1.06	2.45	0.29	1.73	**5.53**	**4.98**
51-60	1.67	1.83	0.42	2.19	**6.11**	**5.51**
61-70	3.27	0.71	1.40	2.01	**7.39**	**6.66**
71-80	6.51	3.38	0.95	0.61	**11.45**	**10.32**
81-90	2.29	3.85	0.00	1.46	**7.60**	**6.85**
91-100	4.12	2.24	0.72	2.71	**9.79**	**8.82**
101-110	2.75	1.37	1.70	2.25	**8.07**	**7.27**
111-120	2.77	0.00	0.00	5.75	**8.52**	**7.68**
121-130	1.15	0.00	0.00	4.91	**6.06**	**5.46**
131-140	5.26	0.00	0.00	3.99	**9.25**	**8.33**
141-150	4.57	0.00	0.00	4.70	**9.27**	**8.35**
151 & above	7.42	0.00	0.00	12.31	**19.73**	**17.78**
Total	**43.06**	**17.03**	**5.65**	**45.25**	**110.99**	**100.00**
% of total growing stock	38.80	15.34	5.09	40.77	100.00	

As may be seen, 38.80%, the total growing stock is contributed by the 1st dominant species (*Quercus serrata)*. The 2nd dominant species (*Albizzia lebbeck*) constitutes 15.34% of the total growing stock. Similarly, the 3rd dominant species *(Schima khasiana)* is 5.09 % of the total growing stock. A major part of the growing stock (*i.e*. 40.77 %) is constituted by the rest of the species.

Figure 3.9.1:Girth class-wise distribution of growing stock

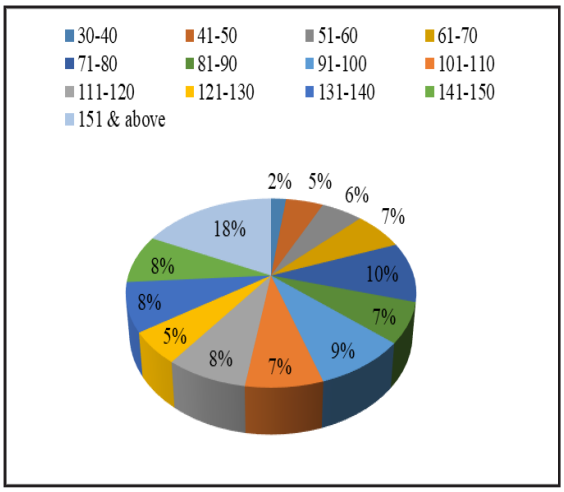


Figure 3.9.2: Species-wise distribution of growing stock

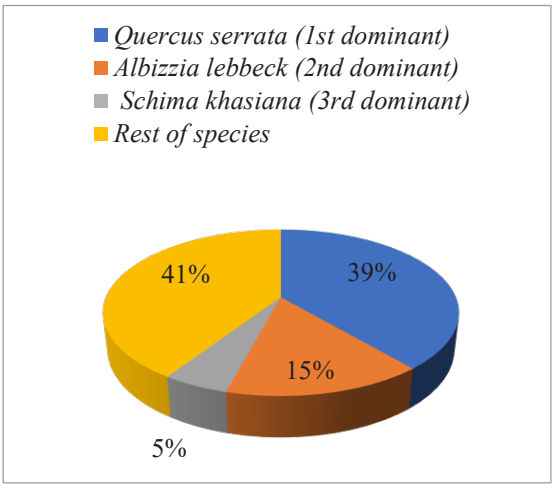


Figure 3.9.3:Girth class-wise distribution of growing stock

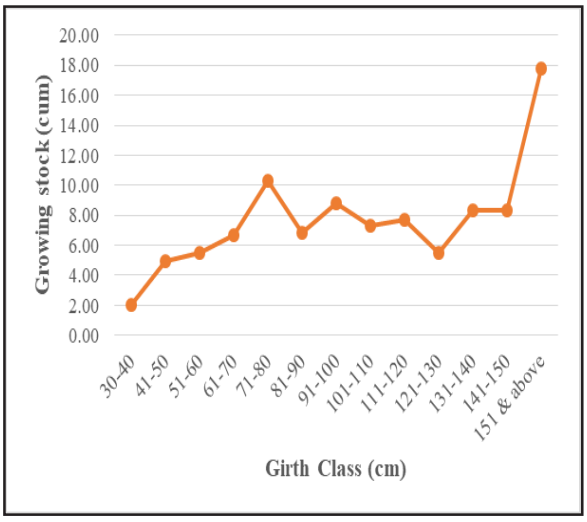
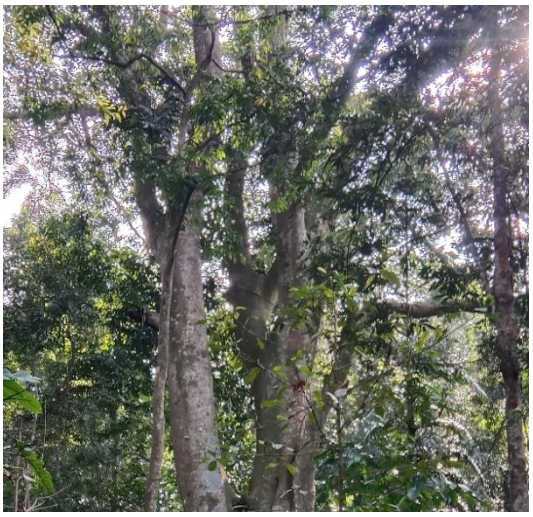


Figure 3.9.4: Overview of *Khlo Blai Rtiang*



3.9.8 Number of Stems

Species-wise number of stems in each girth class are given in Table 3.9.9 below. As may be seen maximum numbers of stems are found in lower girth classes *i.e.* from 30-40 cm to 71-80 cm. Number of stems are inversely proportional to mid-diameter of the girth class.

Table 3.9.9: Species-wise distribution of stems in different girth classes

(numbers of stems)

Girth class (cm)	*Quercus sereta* (1st dominant)	*Albizzia lebbeck* (2nd dominant)	*Schima khasiana* (3rd dominant)	Rest of the species	*Total*
30-40	14	3	2	8	**27**
41-50	14	5	2	11	**32**
51-60	13	3	2	9	**27**
61-70	15	1	4	5	**25**
71-80	20	4	2	1	**27**
81-90	5	4	0	2	**11**
91-100	7	2	1	3	**13**
101-110	4	1	2	2	**9**
111-120	3	0	0	4	**7**
121-130	1	0	0	3	**4**
131-140	4	0	0	2	**6**
141-150	3	0	0	2	**5**
151 & above	3	0	0	4	**7**
Total	**106**	**23**	**15**	**56**	**200**

Figure 3.9.5: Number of stems in different girth classes

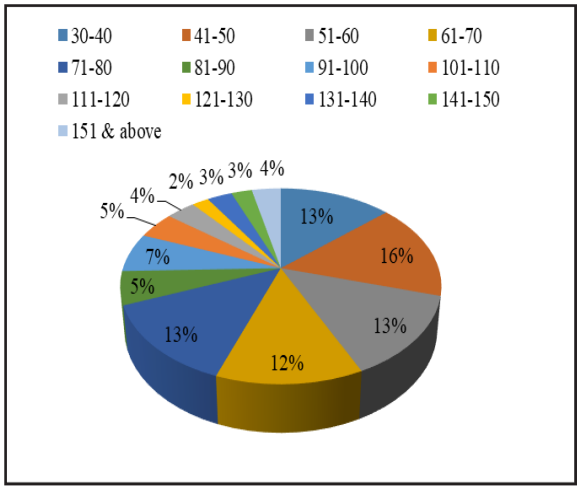


Figure 3.9.6: Species-wise distribution of stems

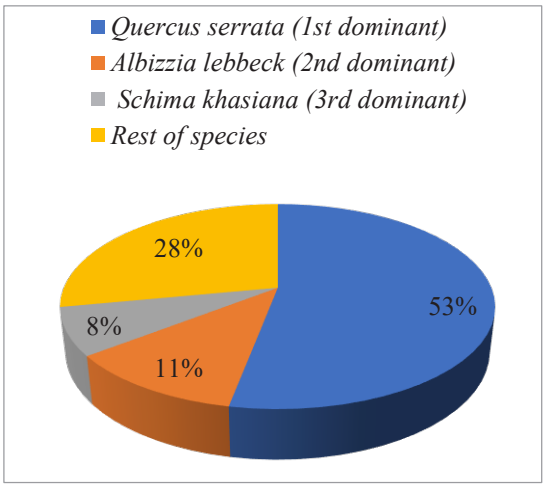


Figure 3.9.7:Number of stems in different girth classes

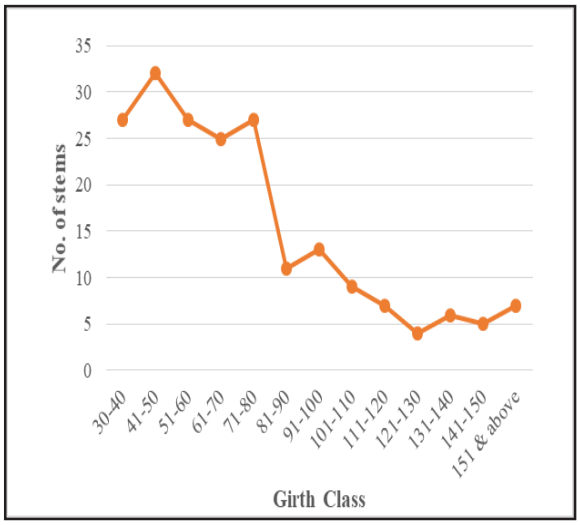


Figure 3.9.8: Inside view of *Khlo Blai Rtiang*



3.9.9 Prescriptions for Future Management

3.9.9.1 Registration with the Jaintia Hills Autonomous District Council

The United Khasi-Jaintia Hills Autonomous District (Management and Control of Forests) Rules, 1960 provides for registration of each sacred grove located in areas falling under jurisdiction of the Jaintia Hills Autonomous District Council (JHADC). Though these rules came into force about 65 years ago, the *Khlo Blai Rtiang* has not been registered with the JHADC. The Chief Forest Officer of the JHADC and the *Sein Raij* of *Khlo Blai Rtiang* may take immediate necessary actions, as provided in Chapter-I of the said rules to register the *Khlo Blai Rtiang* with the JHADC. The same will accord legal recognition and protection from diversion for non-forestry purposes.

3.9.9.2 Notification as Community Reserve

Section 38C of the Wild Life (Protection) Act, 1972 provides that the State Government may, where the community or an individual has volunteered to conserve wild life and its habitat, declare any private or community land not comprised within a National Park, Wildlife Sanctuary or a Conservation Reserve, as a Community Reserve, for protecting fauna, flora and traditional or cultural conservation values and practices. Notification of an area as a Community Reserve accords it legal protection. It also makes it eligible to receive financial assistance under a Centrally Sponsored Scheme of 'Integrated Development of Wildlife Habitats'. The *Sein Raij* of *Khlo Blai Rtiang* and Wildlife Wing in the Forest and Environment Department, Government of Meghalaya may therefore take necessary actions for notification of the *Khlo Blai Rtiang* as a Community Reserve.

3.9.9.3 Boundary Demarcation

Boundary of the *Khlo Blai Rtiang* has not been physically demarcated on the ground. The same may result in intentional or unintentional encroachment. To prevent and to ensure early detection of encroachments, boundary of the *Khlo Blai Rtiang*, wherever it is not constituted by features of

permanent nature may be demarcated by erection of RCC boundary pillars and painting of rings on stem of trees standing on the boundary.

3.9.9.4 Fire Protection

As per the Meghalaya Forest Fire Information System, during a period of 22 years (2002 - 2024) zero fire incident has occurred in the *Khlo Blai Rtiang*. As per the Meghalaya Forest Fire Information System developed by the North Eastern Space Application Centre (NESAC) a major part of the *Khlo Blai Rtiang* is moderately vulnerable to forest fires. However, as per the said information system, a major part of *Khlo Blai Rtiang* is not prone to forest fire. To prevent damage to the *Khlo Blai Rtiang* from accidental forest fires, measures such as creation and periodic cleaning of fire line along the periphery and at critical locations within the *Khlo Blai Rtiang* and engagement of fire watchers during the critical months may be taken.

3.9.9.5 Construction of Soil Moisture Conservation and Water Harvesting Structures

Water is the main factor responsible for the life of plants and animals. There is no stream which flow in and around the grove, hence construction of check-dam and other appropriate soil and moisture conservation structures in different part of the grove is recommended for the benefit of flora and fauna.

3.9.9.6 Creation of Eco-Tourism Facilities

To create awareness about rich biodiversity of the *Khlo Blai Rtiang* and also to create livelihood opportunities for local residents, eco-tourism facilities such as rain shelter cum view point, footpath/ walking trail, sign board, washrooms *etc.* may be built to attract visitors.

3.9.9.7 Restocking of Degraded Areas

Efforts may be made to restock the open degraded patches in *Khlo Blai Rtiang* by assisting and promoting natural regeneration of native species. In areas where natural regeneration is not feasible, artificial regeneration by planting seedlings of native species should be undertaken.

3.9.9.8 Formulation of A Proposal and Registration Thereof on Carbon Registry to Earn Carbon Credits

To reward the local communities for their efforts in conservation and protection of *Khlo Blai Rtiang* for centuries, a proposal may be formulated and registered on an appropriate carbon registry to earn carbon credits for measures to be taken by the local communities for better protection and conservation of the *Khlo Blai Rtiang*.

3.9.9.9 Awareness Campaign

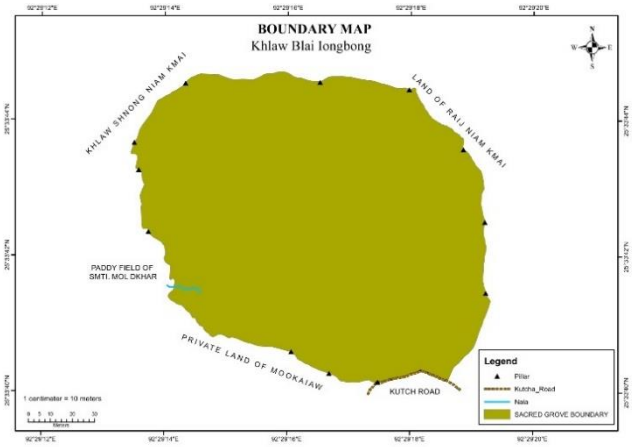
The *Khlo Blai Rtiang* has been protected for centuries for spiritual, conservation and cultural beliefs. Several generations has passed down the beliefs surrounding this grove. As a reminder of the ancestral pledge towards environmental conservation and preservation poster campaign can be organized at such locations. Public awareness can be taken up in the area for the local and non-local

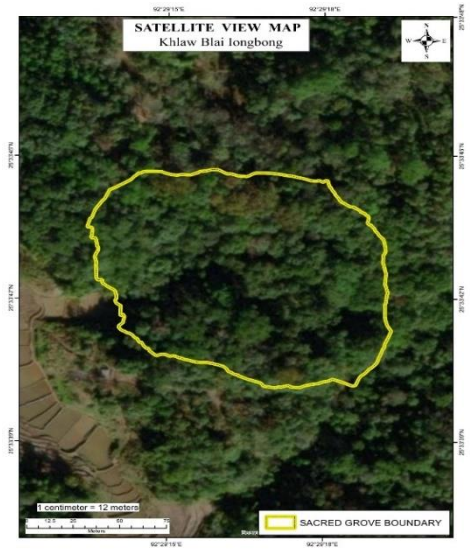
individual to augment the future environmental protection endeavours. Special programme for school children should be conducted for long term conservation of forests.

3.10. *KHLO BLAI IONGBONG*

3.10.1 Location

Khlo Blai Iongbong is situated in West Jaintia Hills District of Meghalaya in *Niawkmai* village at *Elaka Raliang Dolloiship*. It covers an area of 1.79 ha and lies between 25° 33′40" to 25° 33′ 43" N latitude and 92° 29′ 23″ to 92° 29′ 25″ E longitude at an altitude of 990 m above mean sea level. It is bounded in the North, East, West and South by *Khlaw Raij Lai Kur* of *Niawkmai*. The grove is accessible by road from Jowai to *Niawkmai* village which covers about 70 km distance, ifollowed by travel on motorable kutcha road for 1 km.





3.10.2 Brief History

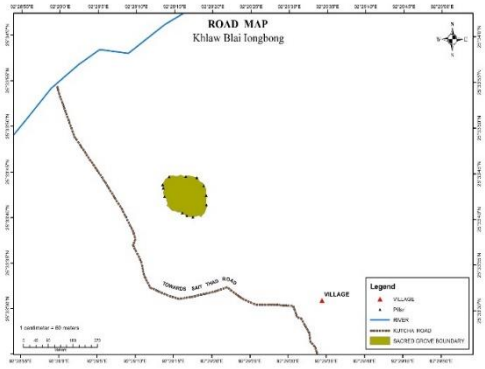
Khlo Blai Iongbong is in existence for several centuries. Religious rituals such as offerings and prayers in the form of annual animal sacrifice are still performed in this sacred forest. The *Khlo Blai Iongbong* has been managed and controlled by the *Sein Raij Niawkmai*. Due to its spiritual significance, the grove is considered to house the various deities and it is known for its myriad of flora that adds to its beauty. Entry inside this grove is strictly prohibited without prior permission from the *Lyngdoh Sein Raij*. Felling of trees, hunting, poaching and grazing are strictly prohibited.

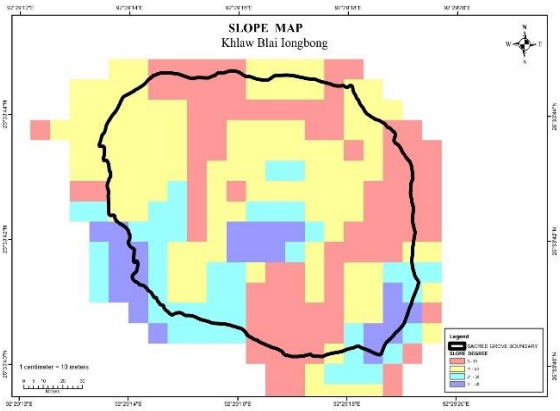
Biotic pressures such as encroachments, hunting, poaching and illegal felling of trees are found to be absent in this forest.

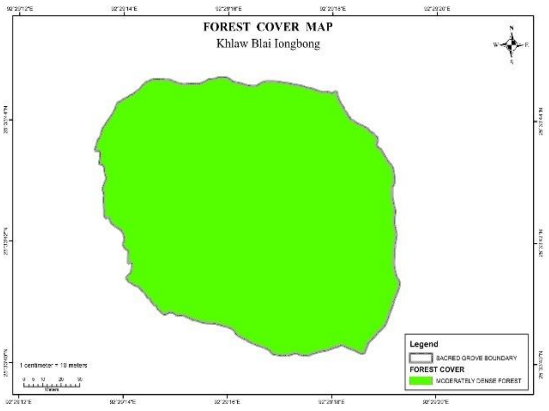
3.10.3 Geography and Climate

Topography of the grove is gentle rolling in nature which slope varying 0.20° to 27°. A major part of the *Khlo Blai Iongbong* falls in different aspects as depicted in 'Aspect Map'. Soil texture is loamy in nature with no coarse fragment. Soil consistency is slightly compact. The soil is brown in colour. Soil depth is shallow ranging from 15 cm to 30 cm.

The average minimum temperature is 8° C and maximum is 30° C. Rainfall varies from heavy to moderate.

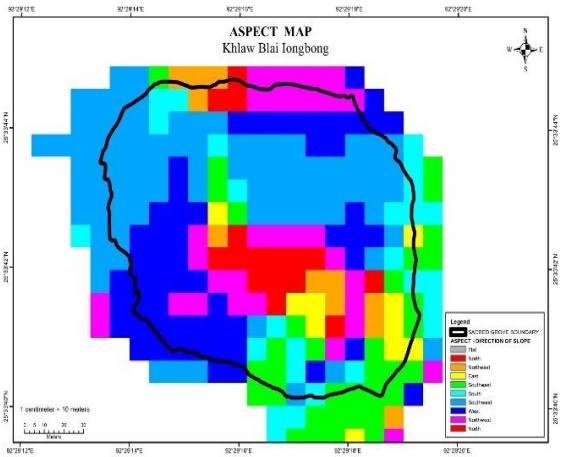


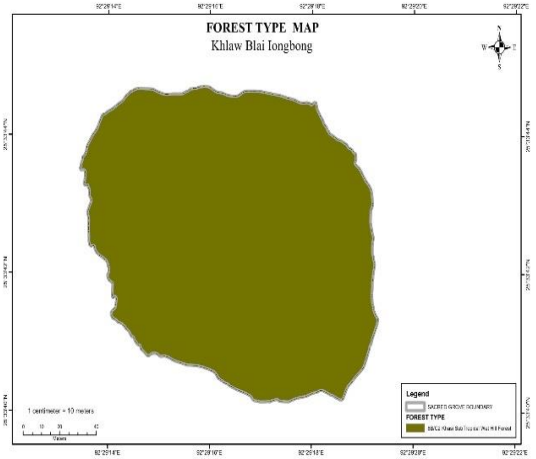




3.10.4 Forest Type

As per the Champion and Seth classification (1968), forests found in the sacred grove are of the ***Type 8B/C2 Khasi Sub Tropical Wet Hill Forest.***

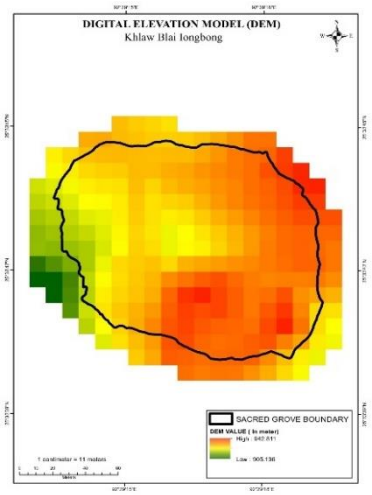




3.10.5 Forest Cover

As per the India State of Forest Report-2021 published by the Forest Survey of India, Dehradun, forest cover in the *Khlo Blai Iongbong* is as below:

Forest Cover	Area (ha.)	% of total Area
Very Dense Forest (> 70%)	0	0
Moderately Dense Forest (40 %-70 %)	1.79	100
Open Forest (10% - 40%)	0	0
Scrub Forest (<10%)	0	0
Non-Forest	0	0
Total	**1.79**	**100**



3.10.6 Flora and Fauna

The *Khlo Blai Iongbong* is home to moderately dense forest of natural origin. *Schima khasiana* and *Castanopsis hystrix* are respectively 1st and 2nd dominant tree species. Many rare, endangered and endemic plant species are also found in the grove.

3.10.6.1: Floral species

Table 3.10.1: Trees found in *Khlo Blai Iongbong*

Sl. No.	Local Name	Botanical Name	Family
1.	*Dieng syrmi*	*Apodytes dimidiata*	*Icacinaceae*
2.	*Dieng jyrting*	*Alstonia scholaris*	*Apocynaceae*
3.	*Dieng paitrisang*	*Carpinus viminea*	*Betulaceae*
4.	*Dieng sning*	*Castanopsis armata*	*Fagaceae*
5.	*Dieng stap*	*Castanopsis hystrix*	*Fagaceae*
6.	*Dieng phyllut*	*Derris robusta*	*Fabaceae*
7.	*Dieng sohliwai*	*Eugenia aqueum*	*Myrtaceae*
8.	*Dieng jri*	*Ficus spp*	*Moraceae*
9.	*Dieng phing (Gomari)*	*Gmelina arborea*	*Lamiaceae*

10.	*Dieng sohsyieng*	*Ilex venuolsa*	*Aquifoliaceae*
11.	*Dieng shida*	*Lagerstroemia speciosa*	*Lythraceae*
12.	*Dieng sohpingiong*	*Magnifira sylvatica*	*Anacardiaceae*
13.	*Dieng sohphielyia*	*Myrica nagi*	*Myricaceae*
14.	*Dieng sasei*	*Pasania fenestrata*	*Fagaceae*
15.	*Dieng kseh*	*Pinus khasiana /kesiya*	*Pinaceae*
16.	*Dieng jakba*	*Polygata arillata*	*Polygalaceae*
17.	*Dieng rtiang*	*Quercus serata*	*Fagaceae*
18.	*Dieng kain*	*Rhus Succedena*	*Anacardiaceae*
19.	*Dieng sohkyndid*	*Sauropus androgynus*	*Euphorbiaceae*
20.	*Dieng ngan*	*Shcima khasiana*	*Theaceae*
21.	*Dieng sohlait*	*Spondias axillaris*	*Anacardiaceae*

Table 3.10.2: Shrubs found in *Khlo Blai Iongbong*

Sl No.	Local Name	Botanical Name	Family
1.	*Dieng soh laper*	*Pinanga gracilis*	*Arecaceae*
2.	*Dieng pyrshit iong*	*Diospyros lotus*	*Ebenaceae*
3.	*Dieng tyrnem*	*Camelia caudula*	*Fagaceae*
4.	*Jalyntham*	*Polygonum chinense*	*Polygonaceae*
5.	*Dieng khawiong*	*Adiantum raddianum*	*Pteridaceae*
6.	*Dieng tiewlieh*	*Hibiscus sabdariffa*	*Malvaceae*

Table 3.10.3: Herbs found in *Khlo Blai Iongbong*

Sl No.	Local Name	Botanical Name	Family
1.	*Tiew blei*	*Coleus spp*	*Lamiaceae*
2.	*Tiew syieng*	*Cynodon dactylon*	*Poaceae*
3.	*Latara*	*Dianthus chinensis*	*Caryophyllaceae*
4.	*Jalynthem*	*Polygonum chinense*	*Polygonaceae*
5.	*Soh khritmas*	*Sarcanda globra*	*Rubiaceae*
6.	*Dieng tiewlieh*	*Hibiscus sabdariffa*	*Malvaceae*

Table 3.10.4: Climbers found in *Khlo Blai Iongbong*

Sl No.	Local Name	Botanical Name	Family
1.	*Soh shang khlaw*	*Thunbergia laurifolia*	*Acanthaceae*
2.	*Jermi Siah nepbah*	*Ampelocissus latifolia*	*Vitaceae*
3.	*Jyrni lieh*	*Passiflora edulis*	*Passifloraceae*
4.	*Siah sohkrot*	*Smilax glabra*	*Smilacaceae*

Table 3.10.5: Grasses found in *Khlo Blai Iongbong*

Sl No.	Local Name	Botanical Name	Family
1.	*Phlang tylli*	*Arundinella khasiana*	*Poaceae*
2.	*Phlang thyrnia*	*Arundinella pumila*	*Poaceae*
3.	*Phlang ot*	*Juncus effusus*	*Juncaceae*

Table 3.10.6: Ferns found in *Khlo Blai Iongbong*

Sl No.	Local Name	Botanical Name	Family
1.	*Tyrkhang khlaw*	*Asplenium nidus*	*Aspleniaceae*
2.	*Tyrkhang syieng*	*Adiantum raddianum*	*Pteridaceae*
3.	*Tyrkhang nar*	*Lophosoria quadripinnata*	*Dicksoniaceae*

3.10.6.2 Faunal Species

No scientific study to assess presence and abundance of wildlife in *Khlo Blai Iongbong* has been carried out so far. However, as per the local residents, presence of some wild animals such as jungle fowls, pangolin and some animals of amphibian, reptile, bird and mammal classes has been reported in this forest.

3.10.7 Growing Stock

As per the methodology described in Chapter-II, enumeration was carried out in 100% area of the forest as its area is less than 2 ha. All the trees, having girth (over bark) at breast height more than 30 cm, were enumerated by measuring the top height (in meters) and the girth (in centimetres) at breast height. Data collected during the enumeration was entered in Sacred Groves Description Form and Plot Enumeration Form. During the enumeration within the grove, data was collected for 216 trees consisting of 70 *Schima khasiana* (1st dominant), 51 *Castanopsis hystrix* (2nddominant), 17 *Castanopsis armata* (3rd dominant), and 78 of rest of Species. Using the Local Volume Equations given in Chapter –II, girth class wise volume was calculated for each species for each of the 13 girth classes starting from 30-40 cm to 151 cm and above. Details of the same are given in the Table 3.10.7 below. As may be seen, total growing stock in this forest is 142.90 cubic metres.

Table 3.10.7: Species wise distribution of growing stock in different girth classes in the entire forest

(cum)

Girth Class (cm)	*Schima khasiana* (1st dominant)	*Castanopsis hystrix* (2nd dominant)	*Castanopsis armata* (3rd dominant)	Rest of the species	Total	% of total growing stock
30-40	0.76	0.61	0.12	1.11	**2.60**	1.82
41-50	1.01	1.58	0.44	2.72	**5.75**	4.02
51-60	1.33	0.83	0.20	1.07	**3.43**	2.40

61-70	2.74	2.04	0.00	3.20	**7.98**	5.58
71-80	5.85	3.75	0.00	3.76	**13.36**	9.35
81-90	2.01	2.16	0.76	0.79	**5.72**	4.00
91-100	1.00	4.62	1.79	8.08	**15.49**	10.84
101-110	4.38	2.27	2.56	2.27	**11.48**	8.03
111-120	5.52	2.72	0.00	5.58	**13.82**	9.67
121-130	6.65	1.50	0.00	0.00	**8.15**	5.70
131-140	0.00	0.00	1.92	0.00	**1.92**	1.34
141-150	13.12	0.00	2.35	2.22	**17.69**	12.38
151 & above	8.98	5.51	8.73	12.29	**35.51**	24.85
Total	**53.35**	**27.59**	**18.87**	**43.09**	**142.90**	100.00
% of total growing stock	**37.33**	**19.31**	**13.21**	**30.15**	**100.00**	

As may be seen, 37.33%, the total growing stock is contributed by the 1st dominant species (*Schima khasiana)*. The 2nd dominant species (*Castanopsis hystrix*) constitutes 19.31% of the total growing stock. Similarly, the 3rd dominant species *(Castanopsis armata) constitutes* 13.21 % of the total growing stock. A substantial part of the growing stock (*i.e.* 30.15%) is constituted by the rest of the species.

Figure 3.10.1:Girth class-wise distribution of growing stock

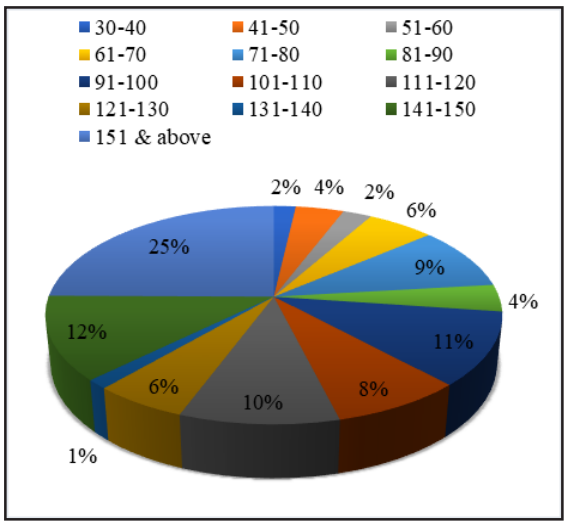


Figure 3.10.2: Species-wise distribution of growing stock

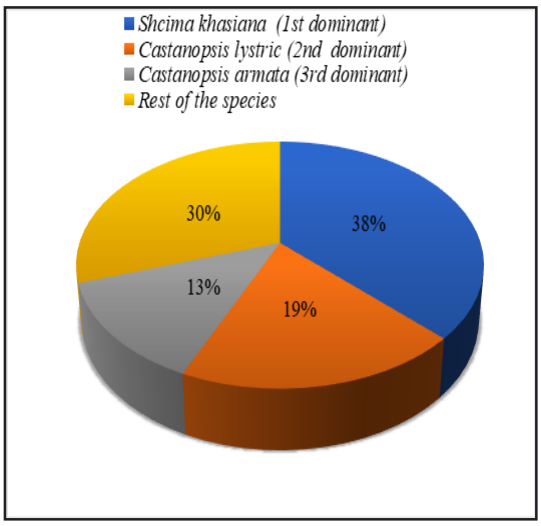


Figure 3.10.3: Girth class-wise distribution of growing stock

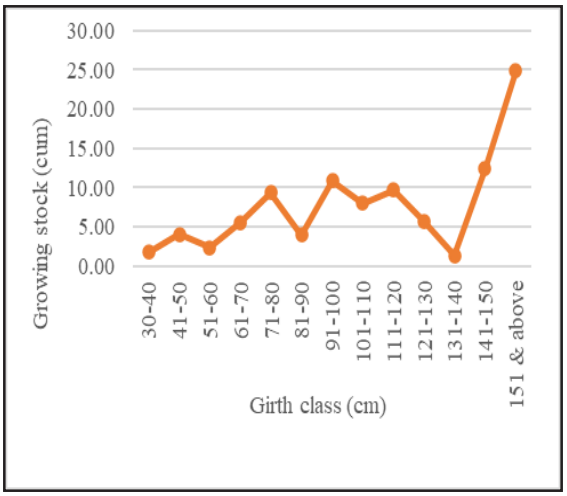


Figure 3.10.4: Inside view of *Khlo Blai Iongbong*



3.10.8 Number of Stems

Species-wise number of stems in each girth class are given in Table 3.10.8 below. As may be seen, maximum numbers of stems are found in lower girth classes *i.e.* from 30-40 cm to 71-80 cm. Number of stems are inversely proportional to mid-diameter of the girth class.

Table 3.10.8: Species-wise distribution of stems in different girth classes in the entire forest

(numbers of stems)

Girth Class (cm)	*Shcima khasiana* (1st dominant)	*Castanopsis lystric* (2nd dominant)	*Castanopsis armata* (3rd dominant)	Rest of the species	Total
30-40	15	11	3	22	51
41-50	7	10	3	17	37
51-60	5	3	1	4	13
61-70	7	5	0	8	20
71-80	11	7	0	7	25
81-90	3	3	1	1	8
91-100	1	5	2	9	17
101-110	4	2	2	2	10
111-120	4	2	0	4	10
121-130	4	1	0	0	5
131-140	0	0	1	0	1
141-150	6	0	1	1	8
151 & above	3	2	3	3	11
Total	**70**	**51**	**17**	**78**	**216**

Figure 3.10.5:Number of stems in different girth classes

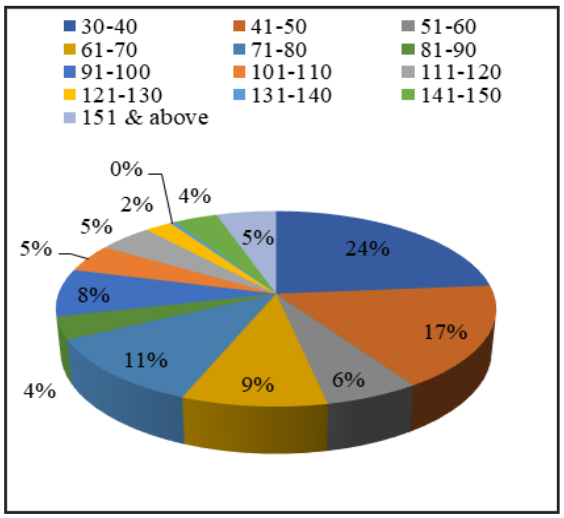


Figure 3.10.6: Species-wise distribution of stems

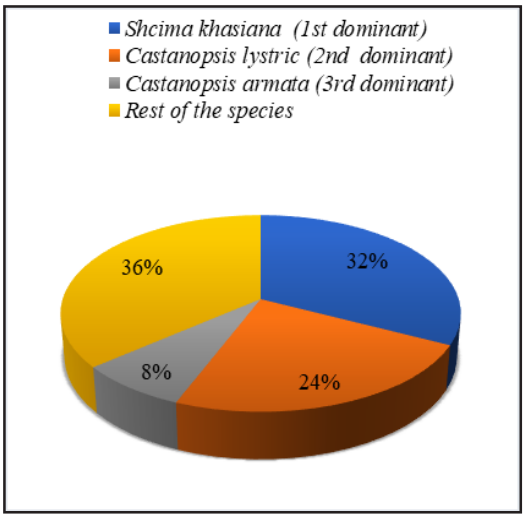


Figure 3.10.7:Number of stems in different girth classes

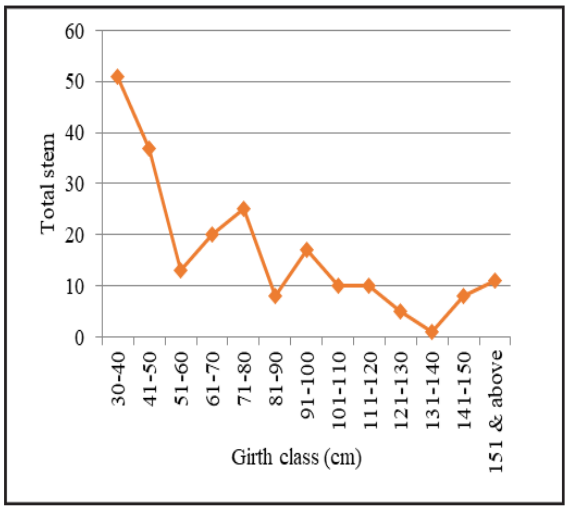


Figure 3.10.4: Overview *Khlo Blai Iongbong*



3.10.9 Prescriptions for Future Management

3.10.9.1 Registration with the Jaintia Hills Autonomous District Council

The United Khasi-Jaintia Hills Autonomous District (Management and Control of Forests) Rules, 1960 provides for registration of each sacred grove located in areas falling under jurisdiction of the Jaintia Hills Autonomous District Council (JHADC). Though these rules came into force about 65 years ago, the *Khlo Blai Iongbong* has not been registered with the JHADC. The Chief Forest Officer of the JHADC and the *Sein Raij* of *Khlo Blai Iongbong* may take immediate necessary actions, as provided in Chapter-I of the said rules to register the *Khlo Blai Iongbong* with the JHADC. The same will accord legal recognition and protection from diversion for non-forestry purposes.

3.10.9.2 Notification as Community Reserve

Section 38C of the Wild Life (Protection) Act, 1972 provides that the State Government may, where the community or an individual has volunteered to conserve wild life and its habitat, declare any private or community land not comprised within a National Park, Wildlife Sanctuary or a Conservation Reserve, as a Community Reserve, for protecting fauna, flora and traditional or cultural conservation values and practices. Notification of an area as a Community Reserve accords it legal protection. It also makes it eligible to receive financial assistance under a Centrally Sponsored Scheme of 'Integrated Development of Wildlife Habitats'. The *Sein Raij* of *Khlo Blai Iongbong* and Wildlife Wing in the Forest and Environment Department, Government of Meghalaya may therefore take necessary actions for notification of the *Khlo Blai Iongbong* as a Community Reserve.

3.10.9.3 Boundary Demarcation

Boundary of the *Khlo Blai Iongbong* has not been physically demarcated on the ground. The same may result in intentional or unintentional encroachment. To prevent and to ensure early detection of encroachments, boundary of the *Khlo Blai Iongbong*, wherever it is not constituted by features of permanent nature may be demarcated by erection of RCC boundary pillars and painting of rings on stem of trees standing on the boundary.

3.10.9.4 Fire Protection

As per the Meghalaya Forest Fire Information System developed by the North Eastern Space Application Centre (NESAC) during a period of 22 years (2002 -2024) no fire incident has has been reported in the *Khlo Blai Iongbong*. As per the said System a major part of the *Khlo Blai Iongbong* is moderately vulnerable to forest fires. Similarly, as per the said information system, a major part of *Khlo Blai Iongbong* is not prone to forest fires. However, as a precautionary measure to prevent damage to the *Khlo Blai Iongbong* from accidental forest fires, measures such as creation and periodic cleaning of fire line along the periphery and at critical locations and engagement of fire watchers during the critical months may be taken.

3.10.9.5 Construction of Soil Moisture Conservation and Water Harvesting Structures

There is no stream or river which flows in and around this grove. To prevent and minimise soil erosion and to improve moisture regime, appropriate soil and moisture conservation structures such as check dam, contour trench etc. may be constructed at suitable locations within the *Khlo Blai Iongbong.*

3.10.9.6 Creation of Eco-Tourism Facilities

To create awareness about rich biodiversity of the *Khlo Blai Iongbong* and also to create livelihood opportunities for local residents, eco-tourism facilities such as rain shelter cum view point, footpath, walking trail, sign board, washrooms *etc.* may be built to attract visitors.

3.10.9.7 Restocking of Degraded Areas

Efforts may be made to restock the open degraded patches in *Khlo Blai Iongbong* by assisting and promoting natural regeneration of native species. Wherever it is not feasible to rectock areas by natural regeneration alone, seedlings of native species may be planted.

3.10.9.8 Formulation of A Proposal and Registration Thereof on Carbon Registry to Earn Carbon Credits

To reward the local communities for their efforts in conservation and protection of *Khlo Blai Iongbong* for centuries, a proposal may be formulated and registered on an appropriate carbon registry to earn carbon credits for measures to be taken by the local communities for better protection and conservation of the *Khlo Blai Iongbong*.

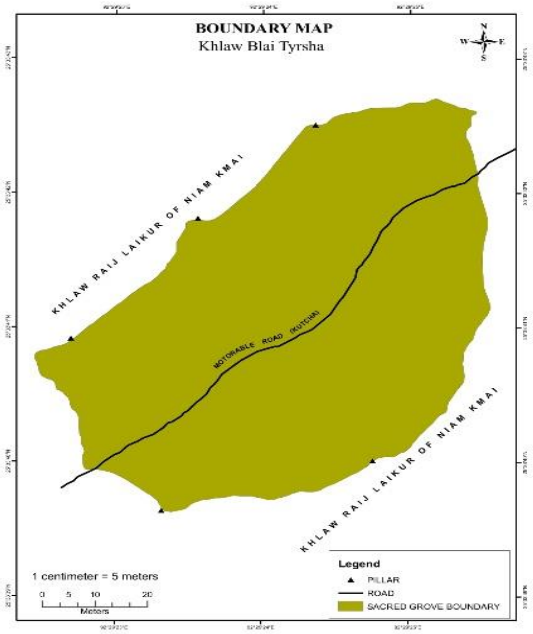
3.10.9.9 Awareness Campaign

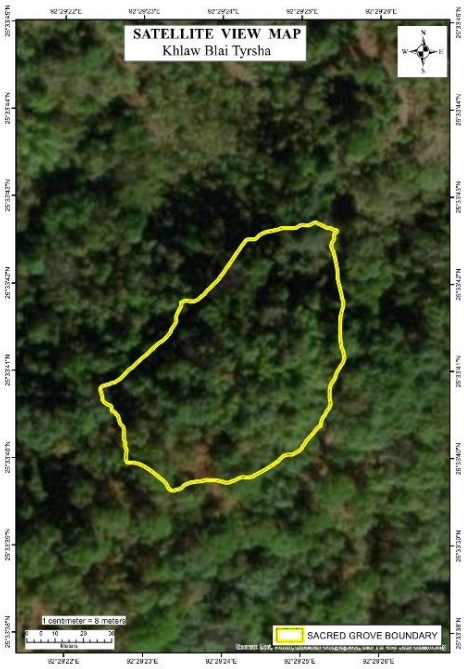
The *Khlo Blai Iongbong* has been protected by the local communities for centuries for spiritual, conservation and cultural beliefs. Several generations has passed down the beliefs associated with this grove. This sacred forest is a reminder of the ancestral pledge towards environmental conservation and preservation. With gradual subordination of these principles, local communities' concern for conservation and protection of sacred groves and other community owned forests is gradually eroding. The same therefore needs to be revived and reinforced by creating awareness among the local communities and grassroot level institutions about cultural, heritage and economic importance of sacred groves and other community owned forests.

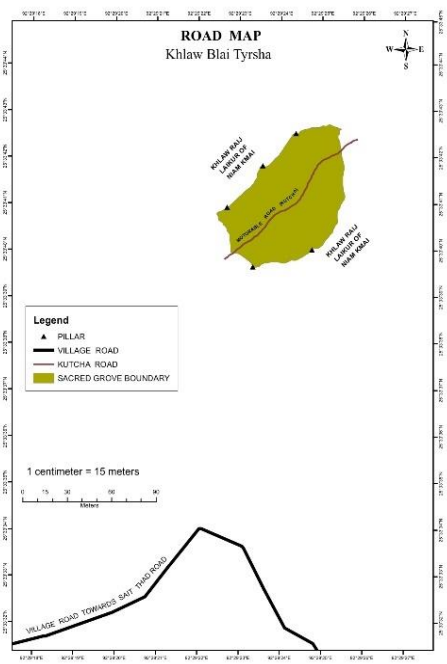
3.11. *KHLO BLAI TYRSHA*

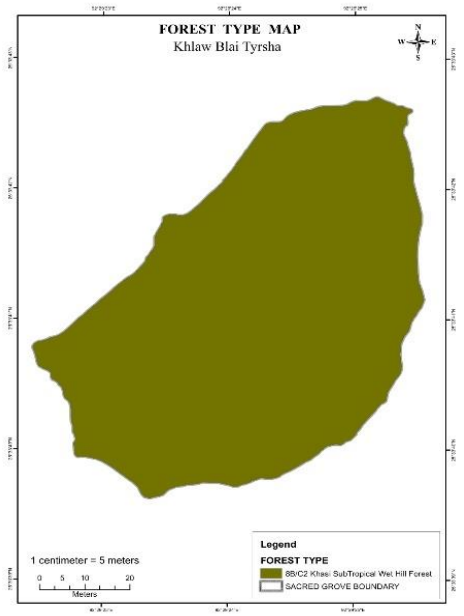
3.11.1 Location

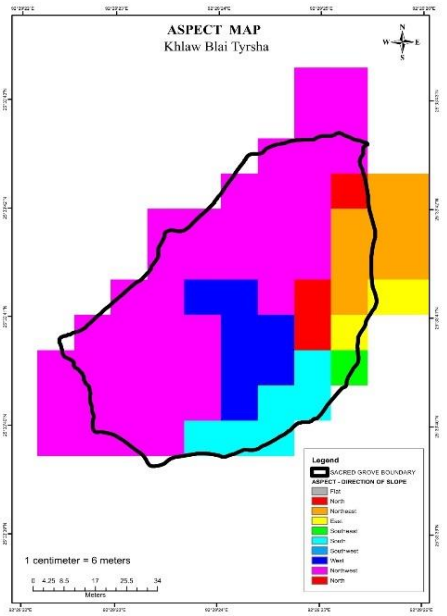
Khlo Blai Tyrsha is situated in West Jaintia Hills District of Meghalaya in *Niawkmai* village under Elaka *Raliang Dolloiship*. It covers an area of 0.51 ha and lies between 25° 33′40" to 25° 33′ 45" N latitude and 92° 29′ 14″ to 92° 29′ 19″ E longitude at an altitude of 966 m above mean sea level. It is bounded in the North-East and North-West by land of *Raij Niawkmai* and *Khlaw Shnong Niawkmai* and in the South by paddy field of one Smti. Mol Dkhar, private land of *Mookaiaw* and a *kutcha* road. The grove is accessible by *Jowai* - *Niawkmai* road which covers about distance of 70 km, it is followed by travel using a motorable *kutcha* road for abound 1 km.











3.11.2 Brief History

Khlo Blai Tyrsha is in existence for several centuries. It is managed and controlled by *Sein Raij Niawkmai*. Offerings and prayers are still performed in the form of annual animal sacrifice. Due

to its religious significance, the grove is considered to house various deities. According to a traditional belief, *Lyngdoh* of *Sein Raij Niawkmai* may perform religious rituals according to the needs of the deities (*Ka thnat, Ka trong*). An unmarried *Lyngdoh* performs religious rituals only by sacrificing hen and the married *Lyngdoh* performs other religious rituals locally called as *i.e. Ka thnat, Ka trong*. Entry inside this grove is strictly prohibited without prior permission from the *Lyngdoh Sein Raij*. Felling of trees, hunting, poaching and grazing are strictly prohibited.

Biotic pressures such as encroachments, hunting, poaching and illegal felling of trees are found to be absent from this forest.

3.11.3 Geography and Climate

Topography of the grove is gentle rolling in nature which slope varying 2° to 28°. A major part of the *Khlo Blai Tyrsha* falls in North-west, Western and Southern aspects. Soil texture is loamy in nature with no coarse fragments. Soil consistency is slightly compact. The colour of the soil is brown. Soil depth is shallow ranging from 15 cm to 30 cm.

Winter season starts from end of October and lasts till March of the next year. Rainfall varies from heavy to moderate.

3.11.4 Forest Type

As per the Champion and Seth classification (1968), forests found in the sacred grove are of the ***Type 8B/C2 Khasi Sub-Tropical Wet Hill Forest.***

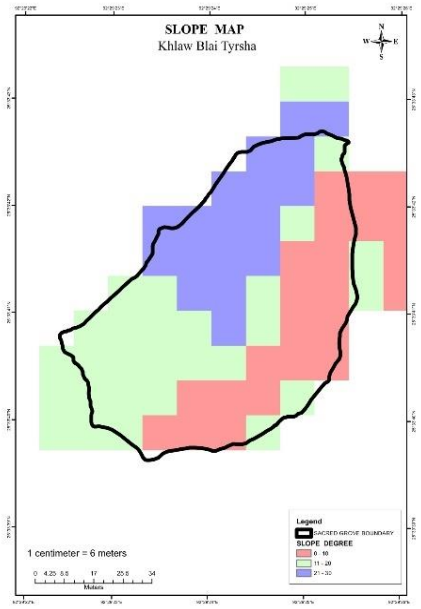
3.11.5 Forest Cover

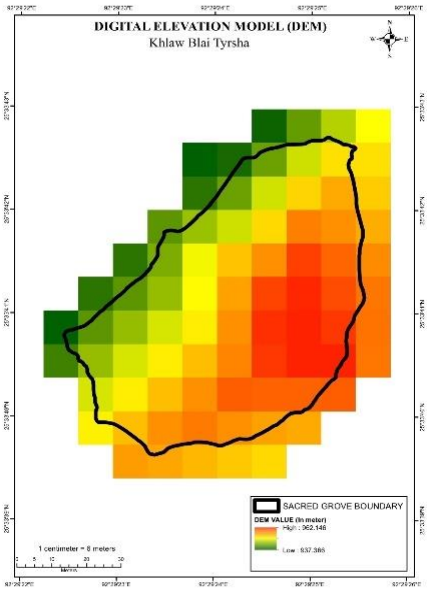
As per the India State of Forest Report-2021 published by the Forest Survey of India, Dehradun, forest cover in the *Khlo Blai Tyrsha* is as below:

Forest Cover	**Area (ha.)**	**% of total Area**
Very Dense Forest (> 70%)	0	0
Moderately Dense Forest (40 %-70 %)	0.29	57.79
Open Forest (10% - 40%)	0.22	42.51
Scrub Forest (<10%)	0	0
Non-Forest	0	0
Total	**0.51**	**100**

3.11.6 Flora and Fauna

The *Khlo Blai Tyrsha* is home to open and moderately dense forest of natural origin. *Schima khasiana* and *Castanopsis hystrix* are respectively 1st and 2nd dominant tree species. Some rare, endangered and endemic plant species are also found in the grove.





3.11.6.1 Floral species

Table 3.11.1: Trees found in *Khlo Blai Tyrsha*

Sl. No.	Local Name	Botanical Name	Family
1.	*Dieng kreit*	*Albizzia lebek*	*Fabaceae*
2.	*Dieng phyllut*	*Albizzia stipulate*	*Fabaceae*
3.	*Dieng rynta/rata*	*Aphanamixis polystachya*	Meliaceae
4.	*Dieng latymphu*	*Aralia armata*	*Belutaceae*
5.	*Dieng sohphan*	*Artocarpus chaplacha*	*Moraceae*
6.	*Dieng lieng*	*Betula alnoides*	*Belutaceae*
7.	*Dieng lapalam/lapasam*	*Butea monosperma*	*Fabaceae*
8.	*Dieng lakhiat*	*Callicarpa arborea*	*Lamiaceae*
9.	*Dieng tlai*	*Caryota urens*	*Arecaceae*
10.	*Dieng siar*	*Castanopsis armata*	*Fagaceae*
11.	*Dieng sniang/diengsning*	*Castanopsis tribuloides*	*Fagaceae*
12.	*Dieng sning*	*Castonopsis armata*	*Fagaceae*
13.	*Dieng sniang/ diengsning*	*Castonopsis indica*	*Fagaceae*
14.	*Dieng thang*	*Diospyros lancifolia*	*Aricaceae*
15.	*Dieng lasaw*	*Elaeocarpus robusta*	*Elaeocarpaceae*
16.	*Dieng jhursaw/lasaw*	*Elaeocarpus robusta*	*Elaeocarpaceae*
17.	*Dieng lba*	*Engelhardtia spicata*	*Juglandaceae*

18.	*Dieng shit*	*Eurya japonica*	*Theaceae*
19.	*Dieng thylliang/sohthylliang*	*Ficus cunia*	*Moraceae*
20.	*Dieng sohlapong*	*Ficus hispida*	*Moraceae*
21.	*Dieng thablang/samehblang*	*Ficus nerifolia*	*Moraceae*
22.	*Dieng tyngjop*	*Ficus spp*	*Moraceae*
23.	*Dieng sohjyllop*	*Ficus spp*	*Moraceae*
24.	*Dieng sohkynpew/sohtyngpiew*	*Heteropanax fragrans*	*Araliaceae*
25.	*Dieng pingkhar/diengpangknai*	*Holarrhena antidysenterica*	*Apocynaceae*
26.	*Dieng sohshyieng*	*Ilex velonosa*	*Aquifoliaceae*
27.	*Dieng sohsyrtet*	*Itea chinensis*	*Iteaceae*
28.	*Dieng lyngsnam/langsnam*	*Knema augustifolia*	*Myristicaceae*
29.	*Dieng sohshriang/sohsiang*	*Ligustrum robustum*	*Oleaceae*
30.	*Dieng sning*	*Lithocarpus tribuloides*	*Fagaceae*
31.	*Dieng lakhar*	*Macaranga denticulate*	*Euphorbiaceae*
32.	*Dieng synrei/ dieng stem*	*Morinda augustifolia*	*Rubiaceae*
33.	*Dieng tieng*	*Oreocnide integrifolia*	*Urticaceae*
34.	*Dieng tyllongrynsi*	*Pentapanax racemosus*	*Pantapanaceae*
35.	*Dieng iapiar*	*Pithecellboiu heterophylum*	*Fagaceae*
36.	*Dieng lieh*	*Premna bengalensis*	*Lamiaceae*
37.	*Dieng syrtap*	*Quercus glauca*	*Fagaceae*
38.	*Dieng wah*	*Quercus serrata*	*Fagaceae*
39.	*Dieng ngan*	*Rhus succedanea*	*Anacardiaceae*
40.	*Dieng sohkynpit/sohlapit*	*Sauropus androgynus*	*Phylanthaceae*
41.	*Dieng ngan*	*Schima khasiana*	*Theaceae*
42.	*Dieng mriew/ryniew*	*Sterculia Velosa*	*Malvaceae*
43.	*Dieng tyniong/iong*	*Symplocos chinensis*	*Symplocaceae*
44.	*Dieng bti/ Dieng nepbe*	*Toona celiata*	Meliaceae
45.	*Dieng shatniat/shadmoit*	*Wendlandia tinctoria*	*Rubiaceae*

Table 3.11.2: Shrubs found in *Khlo Blai Tyrsha*

Sl No.	Local Name	Botanical Name	Family
1.	*Dieng tyrnem shynrang*	*Camelia caducca*	*Theaceae*
2.	*Dieng tyrnem bhoi*	*Camelia kissi.*	*Theaceae*
3.	*Jalamut*	*Agapetus variegate*	*Ericaceae*
4.	*Japung*	*Phragmites koska*	*Poaceae*
5.	*Jalngap iong*	*Inuala cappa*	*Asteraceae*

Table 3.11.3: Herbs found in *Khlo Blai Tyrsha*

Sl No.	Local Name	Botanical Name	Family
1.	*Tiewlieh*	*Hisbiscus sohdariffa*	*Malvaceae*
2.	*Tiew blei*	*Colous spp*	*Lamiceae*
3.	*Tiew sying*	*Cynodon dactylon*	*Poaceae*
4.	*Soh krismas*	*Sarcandra globra*	*Rubiaceae*
5.	*Jalynthem*	*Polygonum chinensis*	*Polygonaceae*

Table 3.11.4: Climbers found in *Khlo Blai Tyrsha*

Sl No.	Local Name	Botanical Name	Family
1.	*Jyrmi shiah, sohkrot*	*Smilax zeylanica*	*Smilacaceae*
2.	*Jyrmi japan*	*Chromolaena odorata*	*Asteraceae*
3.	*Jyrmi kharu*	*Cissompelas pariera*	*Menispermaceae*
4.	*Jyrmi sohpairew*	*Rubus elleplicus*	*Rosaceaea*
5.	*Jyrmi sohlah*	*Gynura bicolor*	*Asteraceae*

Table 3.11.5: Ferns found in *Khlo Blai Tyrsha*

Sl No.	Local Name	Botanical Name	Family
1.	*Tyrkhang sying*	*Adiantum raddianum*	*Pteridaceae*
2.	*Tyrkhang maw*	*Cyathea gigantean*	*Cyatheaceae*
3.	*Tyrkhang nar*	*Lophosoria quadripinnata*	*Dicksoniaceae,*
4.	*Tyrkhang khlaw*	*Asplenium nidus*	*Aspleniaceae*

Table 3.11.6: Grasses found in *Khlo Blai Tyrsha*

Sl No.	Local Name	Botanical Name	Family
1.	*Japing*	*Phrangmites karka*	*Poaceae*
2.	*Phlang ot*	*Juncus effusus*	*Juncaceae*
3.	*Phlang thyrnia*	*Arendenella pumila*	*Poaceae*
4.	*Phlang tylli*	*Arendenella khasiana*	*Poaceae*

3.11.6.2 Faunal Species

No scientific study to assess presence and abundance of wildlife in *Khlo Blai Tyrsha* has been carried out so far. However, as per the local residents, some wild animals such as jungle fowls, pangolin and some amphibians, reptiles, birds and mammals are present in this forest.

3.11.7 Growing Stock

As per the methodology described in Chapter-II, enumeration was carried out in 100% area of the forest as its area is less than 2 ha. All the trees having girth (over bark) at breast height more than 30 cm were enumerated by measuring the top height (in meters) and the girth at breast height (in centimetres). Data collected during the enumeration were entered in Sacred Groves Description Form and Plot Enumeration Form. During the enumeration within the grove, data were collected for 405 trees consisting of 80 *Schima khasiana* (1st dominant), 63 *Castanopsis hystrix* (2nd dominant), 23 *Castanopsis indica* (3rd dominant), and 209 of rest of species. Using the Local Volume Equations given in Chapter –II, girth class wise volume was calculated for each species for each of the 13 girth classes starting from 30-40 cm to 151 cm and above. Details of the same are given in the Table 3.11.7 below. As may be seen, total growing stock in this forest is 525.23 cubic metres.

Table 3.11.7: Species wise distribution of growing stock in different girth classes

(cum)

Girth class (cm)	***Schima khasiana* (1st dominant)**	***Castnopsis hystrix* (2nd dominant)**	***Castanopsis indica* (3rd dominant)**	**Rest of species**	**Total**	**%of the total growing stock**
30-40	0.87	0.05	0.02	0.83	**1.77**	**0.34**
41-50	1.87	1.48	1.16	4.49	**9.00**	**1.71**
51-60	0.42	1.74	1.51	5.43	**9.10**	**1.73**
61-70	1.22	3.81	2.40	10.15	**17.58**	**3.35**
71-80	5.49	1.44	4.60	8.17	**19.70**	**3.75**
81-90	5.19	2.80	5.81	13.00	**26.80**	**5.10**
91-100	2.88	6.39	3.58	13.51	**26.36**	**5.02**
101-110	7.11	4.45	6.72	18.24	**36.52**	**6.95**
111-120	3.29	2.80	2.62	2.60	**11.31**	**2.15**
121-130	2.54	1.72	1.66	12.95	**18.87**	**3.59**
131-140	6.07	1.86	1.86	7.82	**17.61**	**3.35**
141-150	1.77	9.18	2.19	6.67	**19.81**	**3.77**
151 & above	42.48	33.02	6.41	228.89	**310.80**	**59.17**
Total	**81.20**	**70.74**	**40.54**	**332.75**	**525.23**	**100.00**
% of total growing stock	15.46	13.47	7.72	63.35	100.00	

As may be seen,15.46%, the total growing stock is contributed by the 1st dominant species (*Schima khasiana)*. The 2nd dominant species (*Castanopsis hystrix*) constitutes 13.47% of the total growing stock. Similarly, the 3rd dominant species *(Castanopsis indica)* is 7.72% of the total growing stock. major part of the growing stock (*i.e.* 63.35 %) is constituted by the rest of the species which indicates richness of biodiversity in the grove.

Figure 3.11.1:Girth class-wise distribution of growing stock

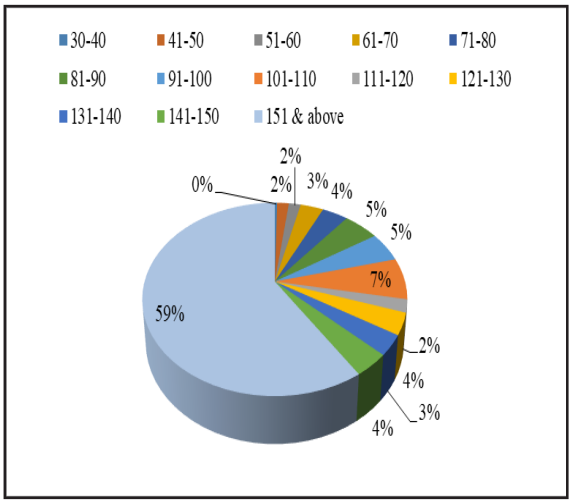


Figure 3.11.2: Species-wise distribution of growing stock

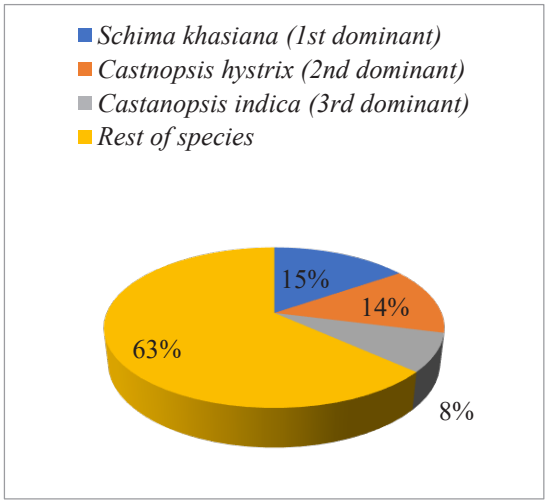


Figure 3.11.3:Girth class-wise distribution of growing stock

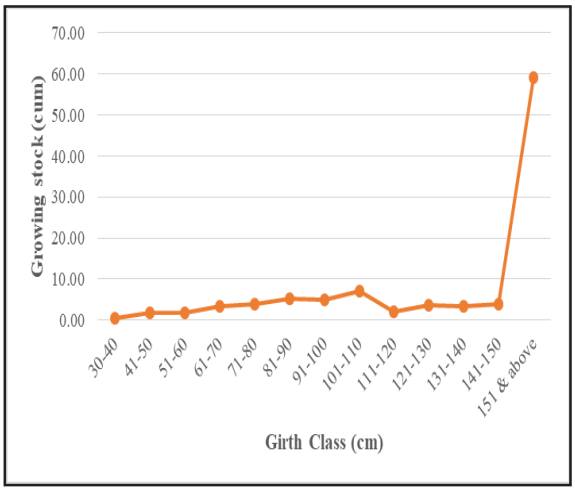


Figure 3.11.4: Overview *of Khlo Blai Tyrsha*



3.11.8 Number of Stems

Species-wise number of stems in each girth class are given in Table 3.11.8 below. As may be seen, maximum numbers of stems are found in mid girth classes *i.e.* from 41-50 cm to 101-110 cm. Large of number of stems in 151 cm and above girth class indicates maturity of the forest. Some of these trees are old growth trees of 'heritage value'.

Table 3.11.8: Species-wise distribution of stems in different girth classes

(numbers of stems)

Girth class (cm)	*Schima khasiana* (1st dominant)	*Castnopsis hystrix* (2nd dominant)	*Castanopsis indica* (3rd dominant)	Rest of the species	Total
30-40	10	1	1	17	**29**
41-50	12	10	7	29	**58**
51-60	2	7	6	21	**36**
61-70	4	10	6	26	**46**
71-80	12	3	9	16	**40**
81-90	9	4	8	18	**39**
91-100	4	7	4	15	**30**
101-110	8	4	6	16	**34**
111-120	3	2	2	2	**9**
121-130	2	1	1	8	**12**
131-140	4	1	1	4	**10**
141-150	1	4	1	3	**9**
151 & above	9	9	1	34	**53**
Total	**80**	**63**	**53**	**209**	**405**

Figure 3.11.5:Number of stems in different girth classes

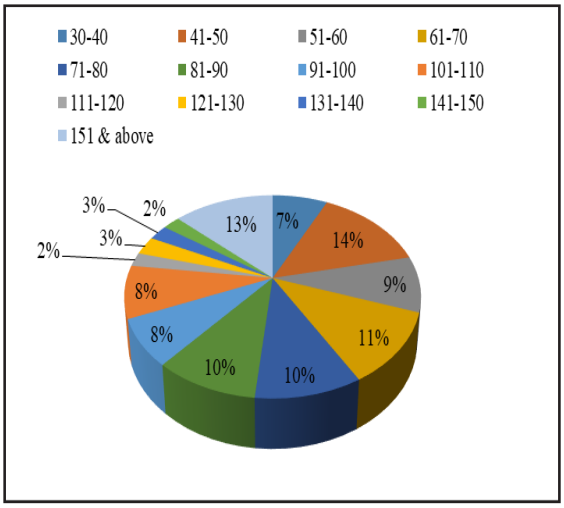


Figure 3.11.6: Species-wise distribution of stems

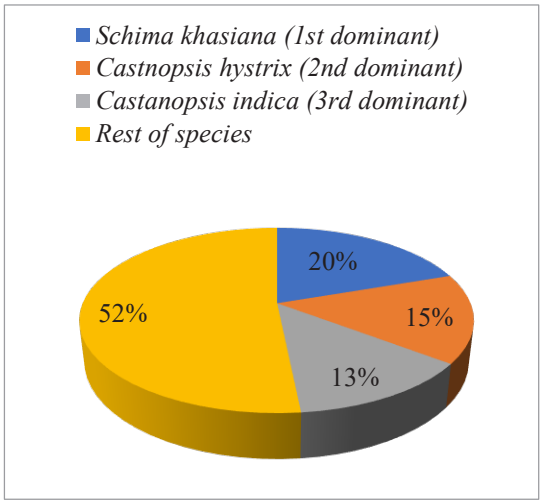


Figure 3.11.7:Number of stems in different girth classes

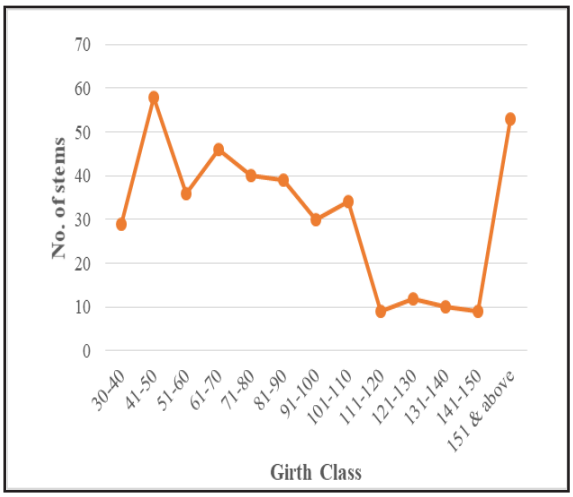


Figure 3.11.8: Inside view *of Khlo Blai Tyrsha*



3.11.9 Prescriptions for Future Management

3.11.9.1 Registration with the Jaintia Hills Autonomous District Council

The United Khasi-Jaintia Hills Autonomous District (Management and Control of Forests) Rules, 1960 provides for registration of each sacred grove located in areas falling under jurisdiction of the Jaintia Hills Autonomous District Council (JHADC). Though these rules came into force about 65 years ago, the *Khlo Blai Tyrsha* has not been registered with the JHADC. The Chief Forest Officer of the JHADC and the *Sein Raij* of *Khlo Blai Tyrsha* may take immediate necessary actions, as provided in Chapter-I of the said rules to register the *Khlo Blai Tyrsha* with the JHADC. The same will accord legal recognition and protection from diversion for non-forestry purposes.

3.11.9.2 Notification as Community Reserve

Section 38C of the Wild Life (Protection) Act, 1972 provides that the State Government may, where the community or an individual has volunteered to conserve wild life and its habitat, declare any private or community land not comprised within a National Park, Wildlife Sanctuary or a Conservation Reserve, as a Community Reserve, for protecting fauna, flora and traditional or cultural conservation values and practices. Notification of an area as a Community Reserve accords it legal protection. It also makes it eligible to receive financial assistance under a Centrally Sponsored Scheme of 'Integrated Development of Wildlife Habitats'. The *Sein Raij* of *Khlo Blai Tyrsha* and Wildlife Wing in the Forest and Environment Department, Government of Meghalaya may therefore take necessary actions for notification of the *Khlo Blai Tyrsha* as a Community Reserve.

3.11.9.3 Boundary Demarcation

Boundary of the *Khlo Blai Tyrsha* has not been physically demarcated on the ground. The same may result in intentional or unintentional encroachments. To prevent and to ensure early detection of encroachments, boundary of the *Khlo Blai Tyrsha*, wherever it is not constituted by

features of permanent nature may be demarcated by erection of RCC boundary pillars and painting of rings on stem of trees standing on the boundary.

3.11.9.4 Fire Protection

As per the Meghalaya Forest Fire Information System System developed by the North Eastern Space Application Centre (NESAC), during a period of 22 years (2002 -2024) zero fire incident has occurred in the *Khlo Blai Tyrsha*. As per the said System a major part of the *Khlo Blai Tyrsha* is moderately vulnerable to forest fires. However, as per the said information system, a major part of *Khlo Blai Tyrsha* is not prone to forest fire. To prevent damage to the *Khlo Blai Tyrsha* from accidental forest fires, measures such as creation and periodic cleaning of fire line along the periphery and at critical locations within the *Khlo Blai Tyrsha* and engagement of fire watchers during the critical months may be taken.

3.11.9.5 Construction of Soil Moisture Conservation and Water Harvesting Structures

As no stream or river flows through this forest, the only way to improve moisture regime in this forest is undertaking soil and water conservation measures such as check dams and contour trench across the slope at suitable locations. Improved water regime will help in attracting wildlife and regeneration of native species

3.11.9.6 Creation of Eco-Tourism Facilities

To create awareness about rich biodiversity of the *Khlo Blai Tyrsha* and also to create livelihood opportunities for local residents, eco-tourism facilities such as rain shelter cum view point, footpath/walking trail, sign board, washrooms *etc.* may be constructed to attract visitors.

3.11.9.7 Restocking of Degraded Areas

Efforts may be made to restock the open forest patches in *Khlo Blai Tyrsha* by assisting and promoting natural regeneration of native species. Wherever it is not feasible to restock the areas by natural regeneration alone, seedlings of native species should be planted.

3.11.9.8 Formulation of A Proposal and Registration Thereof on Carbon Registry to Earn Carbon Credits

To reward the local communities for their efforts in conservation and protection of *Khlo Blai Tyrsha* for centuries, a proposal may be formulated and registered on an appropriate carbon registry to earn carbon credits for measures to be taken by the local communities for better protection and conservation of the *Khlo Blai Tyrsha*.

3.11.9.9 Awareness Campaign

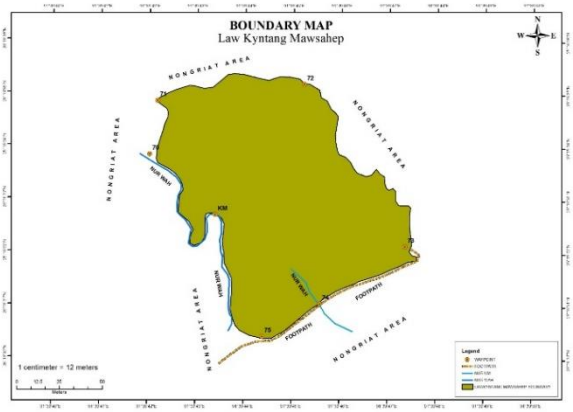
The *Khlo Blai Tyrsha* has been protected by the local communities for centuries for spiritual, conservation and cultural beliefs. Several generations has passed down the beliefs associated with this grove. This sacred forest is a reminder of the ancestral pledge towards environmental conservation and preservation. With gradual subordination of these beliefs and principles, local communities' concern for conservation and protection of sacred groves and other community owned forests is

gradually eroding. The same therefore needs to be revived and reinforced by creating awareness among the local communities and grassroot level institutions about cultural, ecological, heritage and economic importance of sacred groves and other community owned forests.

3.12. *LAW KYNTANG MAWSAHEP*

3.12.1 Location

Law Kyntang Mawsahep is located in East Khasi Hills District at *Nongriat* village under the *Nongriat* Sirdarship. It covers an area of 1.39 ha and lies between 91° 39′ 42″ E to 91° 39′ 47″ E longitude and 25° 15′ 30″ N to 25° 15′ 34″ N latitude at an altitude of about 1,144 m from the mean sea level.



The grove is accessible by Shillong to *Mawlakhiat* road. It is about 70 km from Shillong. To reach the grove, one needs to track for a small distance.



3.12.2 Brief History

It is believed that this Law Kyntang is in existence for several centuries. The forefather of this village realized the need to protect the environment in and around the village to avoid famine. Religious rituals are no longer performed in this grove. The *Law Kyntang* is managed by the local residents of *Nongriat* village under the overall control and supervision of the Sirdar of *Nongriat*. The villagers still preserve this sacred forest for the environmental benefits. Entry into this grove is not prohibited but felling of trees, hunting and poaching are strictly prohibited.

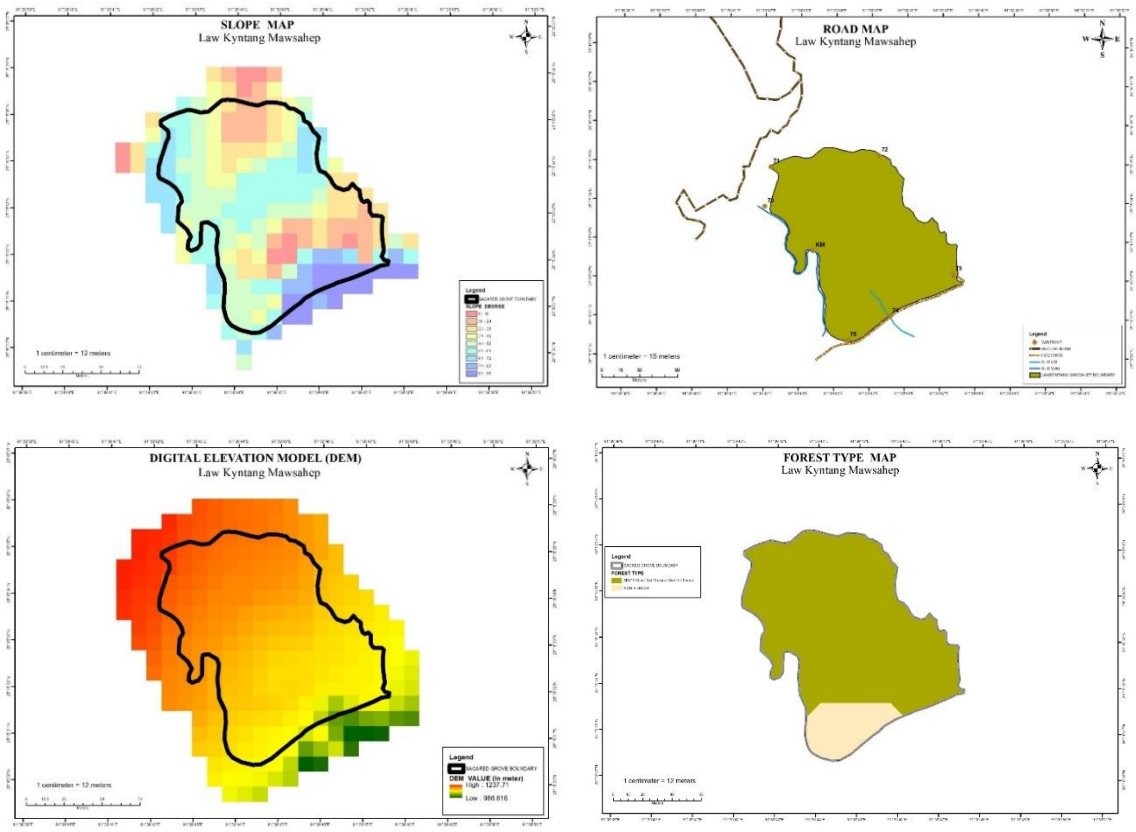
Biotic pressure such as encroachment, hunting, poaching and illegal felling of trees are found to be absent in this forest.

3.12.3 Geography and Climate

The topography of the grove is highly undulating in nature with slope varying from 10° to 80°. *Law Kyntang Mawsahep* falls under the South-East aspect. The soil texture is sandy loam with

boulders and coarse fragment present. Soil consistency is friable. The soil is black in colour and soil depth is medium.

Cold winter season starts from mid-November to February and warm summer from May to October. It receives high rainfall during the monsoon season from April to October. Average temperature varies from 10°C to 24°C.



3.12.4 Forest Type

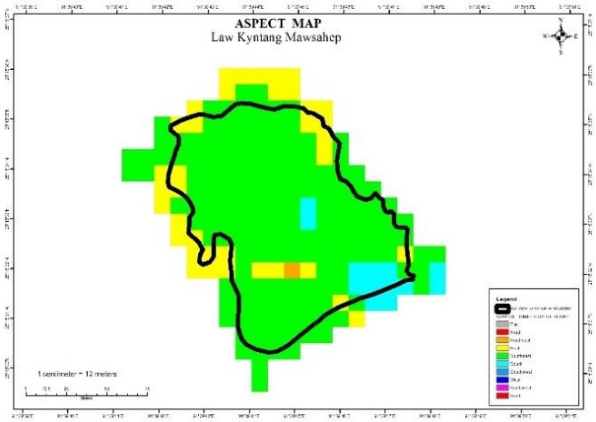
As per the Champion and Seth classification (1968), forests found in the sacred grove are of the ***Type 8B/C2 Khasi Sub-Tropical Wet Hill Forest.***

3.12.5 Forest Cover

As per the India State of Forest Report-2021 published by the Forest Survey of India, Dehradun, a major part of *Law Kyntang Mawsahep* is classified as open and scrub Forest.

3.12.6 Flora and Fauna

Presence of *Macaranga denticulata* as dominant species in *Law Kyntang Mawsahep* indicates secondary nature of this sub-tropical forest. *Macaranga denticulata* is a pioneer tree in fallow succession. *Macaranga denticulata* & *Castanopsis hystrix* are respectively the 1st and 2nd dominant tree species. Some rare, endangered and endemic plant species are also present in this forest.



3.12.6.1 Floral species

Table 3.12.1: Trees found in *Law Kyntang Mawsahep*

Sl. No.	Local Name	Botanical Name	Family
1.	*Dieng saw*	*Albizia stipulata*	*Mimosaceae*
2.	*Dieng latymphu*	*Aralia armata*	*Araliaceae*
3.	*Dieng lieng*	*Betula alnoides*	*Betulaceae*
4.	*Dieng tlai*	*Caryota urens*	*Arecaceae*
5.	*Dieng stap*	*Castanopsis hystrix*	*Fagaceae*
6.	*Dieng sohot*	*Castanopsis indica*	*Fagaceae*
7.	*Dieng latyrdop*	*Cinnamomum bejolghota*	*Lauraceae*
8.	*Dieng torthia*	*Cinnamomum pauciflorum*	*Lauraceae*
9.	*Dieng sohshyrkat*	*Diospyros stricta*	*Ebenaceae*
10.	*Dieng bai*	*Duabanga sonneratioides*	*Lythraceae*
11.	*Dieng lba*	*Engelhardtia spicata*	*Juglandaceae*
12.	*Dieng sohliwa*	*Eugenia aquea*	*Myrtaceae*
13.	*Dieng pyrshit*	*Eurya acuminata*	*Pentaphylacaceae*
14.	*Dieng sohshyrkoh*	*Fagraea ceilanica*	*Gentianaceae*
15.	*Dieng thylliang*	*Ficus lamponga*	*Moraceae*
16.	*Dieng soheitblang*	*Grewia abutifolia*	*Malvaceae*
17.	*Dieng sohsnam*	*Haematocarpus validus*	*Menispermaceae*
18.	*Dieng sohshyieng*	*Ilex venulosa*	*Aquifoloaceae*
19.	*Dieng lalieh*	*Inula cappa*	*Asteraceae*
20.	*Dieng sohsyrtet*	*Itea chinensis*	*Iteaceae*
21.	*Dieng sohsying*	*Litsea cubeba*	*Lauraceae*
22.	*Dieng lakhar*	*Macaranga denticulata*	*Euphorbiaceae*
23.	*Dieng lakhoh*	*Mallotus alba*	*Euphorbiaceae*
24.	*Dieng rai*	*Michelia champaca*	*Magnoliaceae*
25.	*Dieng jarongsi*	*Pantapanox recemasum*	*Poaceae*

26.	*Dieng siar*	*Pithecellobium bigeminum*	*Fabaceae*
27.	*Dieng soh sia*	*Quercus dealbata*	*Fagaceae*
28.	*Dieng sohlakor/sohtyngkeing*	*Rauvolifia densiflora*	*Apocynaceae*
29.	*Dieng bsiat*	*Rhus succedania*	*Anacardiaceae*
30.	*Dieng sohpaitpuraw*	*Sapindus erectus*	*Sapindaceae*
31.	*Dieng jalngap*	*Saurauia punduana*	*Actinidiaceae*
32.	*Dieng ngan*	*Schima khasiana*	*Theaceae*
33.	*Dieng bti*	*Toona ciliata*	*Meliaceae*

Table 3.12.2: Shrubs found in *Law Kyntang Mawsahep*

Sl No.	Local Name	Botanical Name	Family
1.	*Dieng soh pyrsit*	*Eurya acuminata*	*Pentaphylacaceae*
2.	*Lajaremlieh*	*Clerodendrum viscosum*	*Verbenaceae*
3.	*Dieng sohjabuit*	*Phlogacanthus thyrsiflorus*	*Acanthaceae*
4.	*Dieng kaitkhlaw*	*Musa acuminata*	*Musaceae*
5.	*Dieng sohniangmat*	*Mahonia pycnophylla*	*Berberidaceae*

Table 3.12.3: Herbs found in *Law Kyntang Mawsahep*

Sl No.	Local Name	Botanical Name	Family
1.	*Wang khlaw*	*Esculenta spp*	*Araceae*
2.	*Soh byrthit*	*Urena lobata*	*Malvaceae*
3.	*Phud wang*	*Colocasia spp.*	*Araceae*
4.	*Sla lamet*	*Phrynium pubinerve*	*Marantaceae*
5.	*Synrai khlaw*	*Alpinia spp.*	*Gingiberaceae*
6.	*Bat eroplain*	*Inula cappa*	*Asteraceae*

Table 3.12.4: Climbers found in *Law Kyntang Mawsahep*

Sl No.	Local Name	Botanical Name	Family
1.	*Soh shang khlor*	*Elaeagnus pyriformis*	*Elaeagnaceae*
2.	*Jyrmi pew shrieh*	*Hedera nepalensis*	*Araliaceae*
3.	*Jermi sohmatan*	*Stephania glabra*	*Menispermaceae*
4.	*Sla kynda jyrmi*	*Pothos seandens*	*Aralaceae*
5.	*Jyrmi loapla*	*Rhaphidophora decursiva*	*Araceae*
6.	*Jyrmi soh krot*	*Smilax zeylanica*	*Smilacaceae*

Table 3.12.5: Ferns found in *Law Kyntang Mawsahep*

Sl No.	Local Name	Botanical Name	Family
1.	*Tyrkhang*	*Polypodium spp*	*Polypodiaceae*
2.	*Tyrkhang khlaw*	*Asplenium nidus*	*Aspleniaceae*
3.	*Tyrkhang iong*	*Adiantum raddianum*	*Pteridaceae*

Table 3.20.6: Grasses found in *Law Kyntang Mawsahep*

Sl No.	Local Name	Botanical Name	Family
1.	*Phlang jem*	*Hedyotis uncinella*	*Rubiaceae*
2.	*Phlang thyrnia*	*Arundinella pumila*	*Poaceae*
3.	*Phlang ot*	*Juncus effusus*	*Juncaceae*
4.	*Phlang tylli*	*Arundinella khasiana*	*Poaceae*

Table 3.12.7: Bamboo found in *Law Kyntang Mawsahep*

Sl No.	Local Name	Botanical Name	Family
1.	*Kdait namlang*	*Chimonobambusa khasiana*	*Poaceae*

3.12.6.2 Faunal Species

No scientific study to assess presence and abundance of wildlife in *Law Kyntang Mawsahep* has been carried out so far. However, as per the local residents, natural presence of some wild animals such are jungle fowls and several vertebrates and invertebrates has been noted in this forest.

3.12.7 Growing Stock

As per the methodology described in Chapter-II, enumeration was carried out in 100% area of the forest as its area is less than 2 ha. All the trees, having girth (over bark) at breast height more than 30 cm, were enumerated by measuring the top height (in meters) and the girth (in centimetres) at breast height. Data collected during the enumeration was entered in Sacred Groves Description Form and Plot Enumeration Form. During the enumeration within the grove, data was collected for 193 trees species consisting 17 *Macaranga denticulata* (1st dominant), 16 *Castanopsis hystrix* (2nd dominant), 15 *Cinnamomum bejolghota* (3rd dominant) and 145 trees of rest of species. Using the Local Volume Equations given in Chapter –II, girth class wise volume was calculated for each tree species for each of the 13 girth classes starting from 30-40 cm to 151 cm and above. Details of the same are given in Table 3.12.7 below. As may be seen, total growing stock in this forest is 128.49 cubic metres.

Table 3.12.7: Species-wise distribution of growing stock in different girth glasses

(cum)

Girth Class (cm)	*Macaranga denticulata* (1st dominant)	*Castanopsis hystrix* (2nd dominant)	*Cinnamomum bejolghota* (3rd dominant)	Rest of the species	Total	% of total growing stock
30-40	0.24	0.00	0.00	0.80	**1.04**	0.81
41-50	0.79	0.00	0.00	1.51	**2.30**	1.79
51-60	0.55	0.54	0.00	3.07	**4.16**	3.24
61-70	0.00	1.52	0.16	10.68	**12.36**	9.62
71-80	0.00	2.62	0.48	10.66	**13.76**	10.71
81-90	0.00	1.59	1.77	15.08	**18.44**	14.35
91-100	0.00	0.00	2.28	6.64	**8.92**	6.94
101-110	0.00	1.25	1.62	9.49	**12.36**	9.62
111-120	0.00	1.48	0.00	11.80	**13.28**	10.34
121-130	0.00	0.00	0.00	5.07	**5.07**	3.95
131-140	0.00	1.98	1.48	5.88	**9.34**	7.27
141-150	0.00	0.00	0.00	13.09	**13.09**	10.19
151 & above	0.00	0.00	2.59	11.78	**14.37**	11.18
Total	**1.58**	**10.98**	**10.38**	**105.55**	**128.49**	100.00
% of total growing stock	**1.23**	**8.55**	**8.08**	**82.15**	**100.00**	

As may be seen, only 1.23% of the total growing stock is contributed by the 1st dominant species (*Macaranga denticulata)* as this is a small tree. The 2nd dominant species (*Castanopsis hystrix*) constitutes 8.55 % of the total growing stock. Similarly, the 3rd dominant species *(Cinnamomum bejolghota)* constitutes 8.08% of the total growing stock. A major part of the growing stock (*i.e.* 82.15 %) is constituted by the rest of the species.

Figure 3.12.1: Girth class-wise distribution of the growing stock

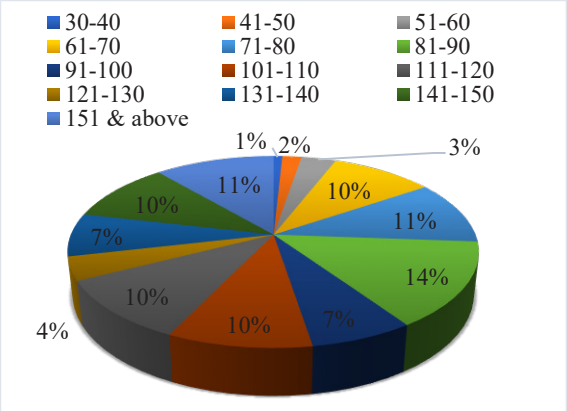


Figure 3.12.2: Species-wise distribution of growing stock

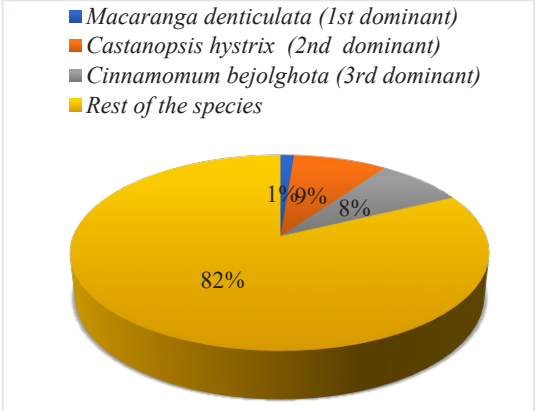


Figure 3.12.3:Girth class-wise distribution of the growing stock

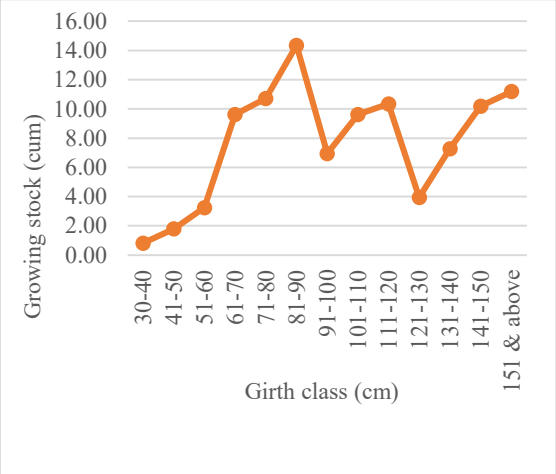


Figure 3.12.4: Inside view of *Law Kyntang*



3.12.8 Number of Stems

Species-wise number of stems in each girth class are given in Tables 3.12.8 below. As may be seen, maximum numbers of stems are found in lower girth classes *i.e.* from 30-40 cm to 91-100 cm. Number of stems are inversely proportional to mid-diameter of the girth class

Table 3.1213: Species wise distribution of stems in different girth in the entire forest

(numbers of stems)

Girth Class (cm)	*Macaranga denticulata* (1st dominant)	*Castanopsis hystrix* (2nd dominant)	*Cinnamomum bejolghota* (3rd dominant)	Rest of the species	Total
30-40	4	0	0	15	19
41-50	9	0	0	11	20
51-60	4	2	0	12	18
61-70	0	4	1	27	32
71-80	0	5	2	20	27
81-90	0	2	4	21	27
91-100	0	0	4	7	11
101-110	0	1	2	8	11
111-120	0	1	0	8	9
121-130	0	0	0	3	3
131-140	0	1	1	3	5
141-150	0	0	0	6	6

151 & above	0	0	1	4	5
Total	**17**	**16**	**15**	**145**	**193**

Figure 3.12.5:Number of stems in distribution girth classes

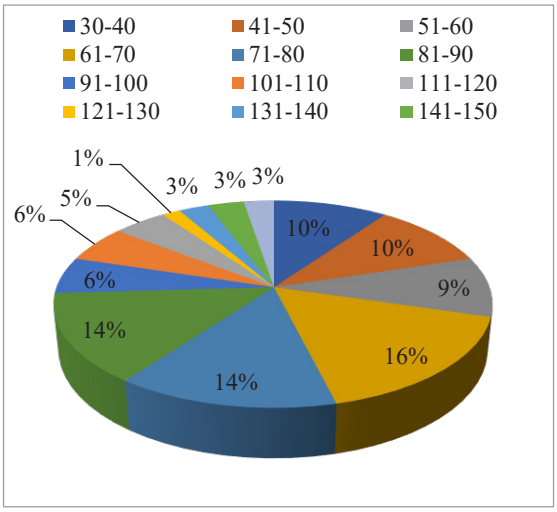


Figure 3.12.6: Species-wise distribution of stems

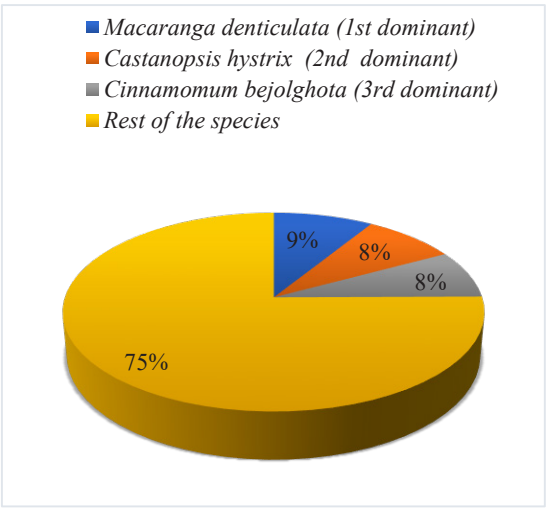


Figure 3.12.7:Girth class-wise distribution of the growing stock

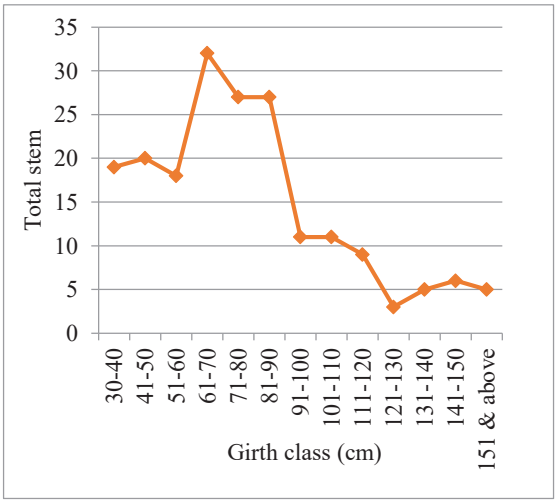


Figure 3.12.8: Outside view of *Law Kyntang Mawsahep*



3.12.9 Prescriptions for Future Management

3.12.9.1 Registration with the Khasi Hills Autonomous District Council

The United Khasi-Jaintia Hills Autonomous District (Management and Control of Forests) Rules, 1960 provides for registration of each Law Kyntang located in areas falling under jurisdiction

of the Khasi Hills Autonomous District Council (KHADC). Though these rules came into force about 65 years ago, the *Law Kyntang Mawsahep* has not been registered with the KHADC. The Chief Forest Officer of the KHADC and the Village *Dorbar* of *Nongriat* may take immediate necessary actions, as provided in Chapter-I of the said rules to register the *Law Kyntang Mawsahep* with the KHADC. The same will accord legal recognition and protection from diversion for non-forestry purposes.

3.12.9.2 Notification as Community Reserve

Section 38C of the Wild Life (Protection) Act, 1972 provides that the State Government may, where the community or an individual has volunteered to conserve wild life and its habitat, declare any private or community land not comprised within a National Park, Wildlife Sanctuary or a Conservation Reserve, as a Community Reserve, for protecting fauna, flora and traditional or cultural conservation values and practices. Notification of an area as a Community Reserve accords it legal protection. It also makes it eligible to receive financial assistance under a Centrally Sponsored Scheme of 'Integrated Development of Wildlife Habitats'. The *Dorbar* of *Law Kyntang Mawsahep* and Wildlife Wing in the Forest and Environment Department, Government of Meghalaya may therefore take necessary actions for notification of the *Law Kyntang Mawsahep* as a Community Reserve.

3.12.9.3 Boundary Demarcation

Boundary of the *Law Kyntang Mawsahep* has not been physically demarcated on the ground. The same may result in intentional or unintentional encroachment. *Nur Wah* stream which flow in the western part of the boundary and footpath in the South marks some permanent boundary feature. To prevent and to ensure early detection of encroachments, boundary of the *Law Kyntang Mawsahep*, wherever it is not constituted by features of permanent nature may be demarcated by erection of RCC boundary pillars and painting of rings on stem of trees standing on the boundary.

3.12.9.4 Fire Protection

As per the Meghalaya Forest Fire Information System, during a period of 22 years (2002 - 2024) zero fire incident has occurred in the *Law Kyntang Mawsahep*. As per the Meghalaya Forest Fire Information System developed by the North Eastern Space Application Centre (NESAC) a major part of the *Law Kyntang Mawsahep* is highly vulnerable to forest fires. Similarly, as per the said information system, a major part of the *Law Kyntang Mawsahep* is moderately prone to forest fire. To prevent damage to the *Law Kyntang Mawsahep* from accidental forest fires, measures such as creation and periodic cleaning of fire line along the periphery and at critical locations within the *Law Kyntang Mawsahep* and engagement of fire watchers during the critical months may be taken.

3.12.9.5 Construction of Soil Moisture Conservation and Water Harvesting Structures

There are two stream *i.e*. *Nur Wah* Stream which flow in the western part of the boundary and *Nur Um* which flow through this grove. To improve soil moisture content and for the benefit of wildlife, water harvesting structures such as check dam, contour trench, may be constructed at suitable locations in the *Law Kyntang Mawsahep*.

3.12.9.6 Creation of Eco-Tourism Facilities

To create awareness about rich biodiversity of the *Law Kyntang Mawsahep* and also to create livelihood opportunities for local residents, eco-tourism facilities such as rain shelter cum view point, footpath/ walking trail, sign board, washrooms *etc.* may be constructed to attract tourists.

3.12.9.7 Restocking of Degraded Areas

This sacred grove shows symptoms of a degraded forest; hence efforts must be made to restock *Law Kyntang Mawsahep* by assisting and promoting natural regeneration of native species. In areas where natural regeneration is not feasible, artificial regeneration by planting seedlings of native species should be undertaken.

3.12.9.8 Formulation of A Proposal and Registration Thereof on Carbon Registry to Earn Carbon Credits

To reward the local communities for their efforts in conservation and protection of *Law Kyntang Mawsahep* for centuries, a proposal may be formulated and registered on an appropriate carbon registry to earn carbon credits for measures to be taken by the local communities for better protection and conservation of the *Law Kyntang Mawsahep.*

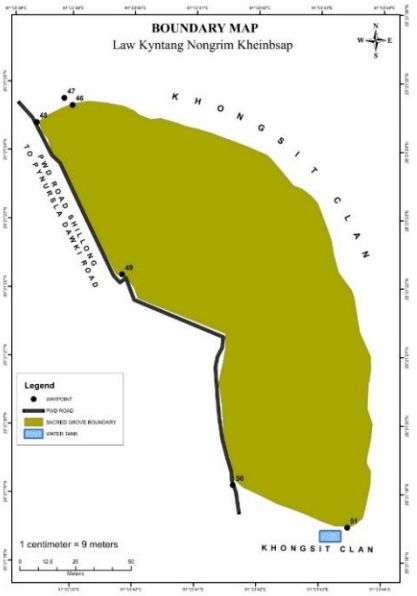
3.12.9.9 Awareness Campaign

The *Law Kyntang Mawsahep* shows symptoms of a degraded forest due to relegation of spiritual, conservation and cultural beliefs. Local communities' concern for conservation and protection of sacred groves and other community owned forests is gradually declining. The same therefore needs to be revived and reinforced by creating awareness among the local communities and grassroot level institutions about cultural, heritage and economic importance of sacred groves and other community owned forests.

3.13. *LAW KYNTANG NONGRIM KHEINBSAP*

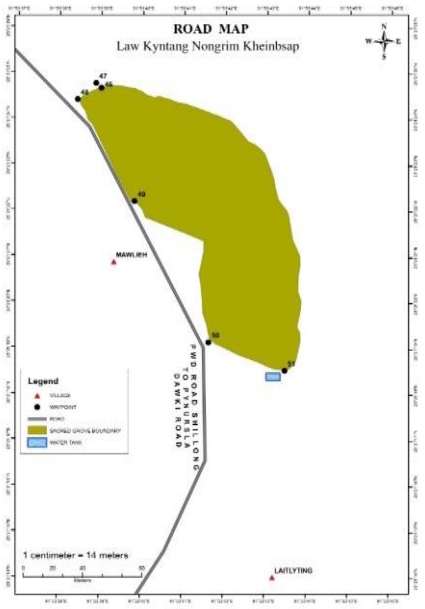
3.13.1 Location

Law Kyntang Nongrim Kheinbsap is situated in East Khasi Hills District at *Nongrim Kheinbsap* village under the *Hima Khyrim* Syiemship. It covers an area of 1.43 ha and lies between 91° 53′ 38″ E to 91° 53′ 44″ E longitude and 25° 21′ 19″ N to 25° 21′ 24″ N latitude at an altitude of about 1,558 m from the mean sea level. The grove is bounded in the North-East and South by the land of *Khongsit* Clan and in the South-West by a PWD Road and Shillong - *Pynursla-Dawki* Road. The grove is accessible from Shillong by *Pynursla-Dawki* Road. It is located at a distance of about 40 km from Shillong.



3.13.2 Brief History

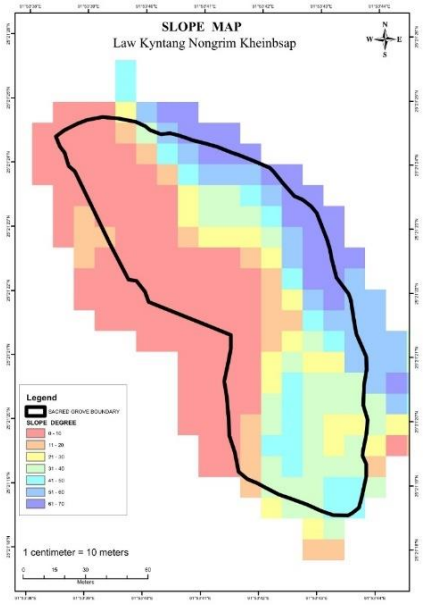
Law Kyntang Nongrim Kheinbsap is in existence for several decades. Religious rituals such as offerings, prayers and other religious practices are no longer performed in this grove. As stated by the village elders, any activity inside the grove is strictly prohibited. The *Law Kyntang Nongrim Kheinbsap* is managed and controlled by the residents of the *Nongrim Kheinbsap* village through Headman (village chief). The conservation and preservation of the *Law Kyntang* is still a part and parcel of the village administration. The forest is currently free from biotic pressures such as encroachments, hunting, poaching, illegal felling of trees *etc*.





3.13.3 Geography and Climate

The topography of the grove is undulating in nature with steep slopes and hilly terrain. The slope varies from 10° to as high as 60°. A major part of this grove falls under Eastern and Northeast aspects. The soil texture is loamy with no coarse fragment. Soil consistency is slightly compact. The soil is brown in colour and soil depth is medium. Signs of soil erosion were observed during field visit.



Winter season starts from end of October and lasts till March of the next year. It receives high rainfall during the monsoon season from April to September. Average temperature varies from 6°C to 24°C.

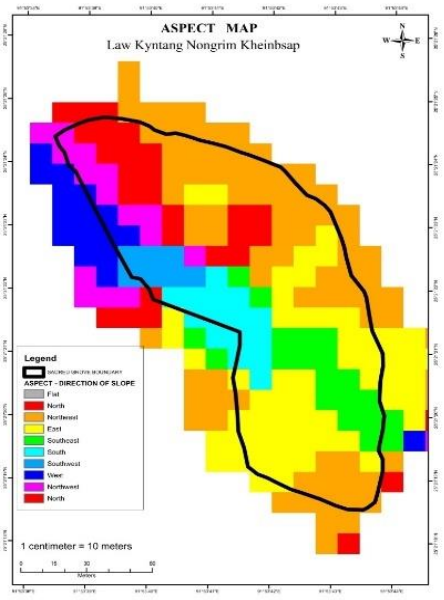
3.13.4 Forest Type

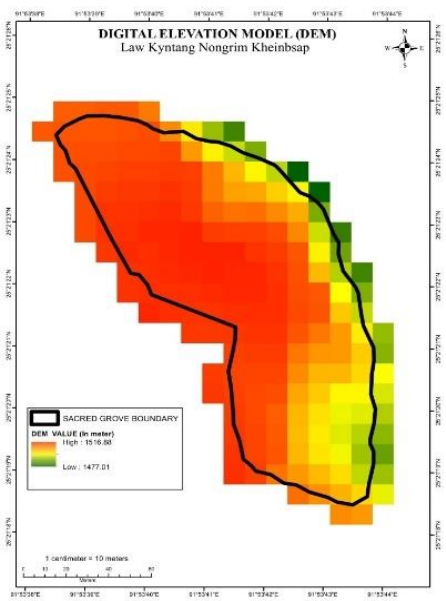
As per the Champion and Seth classification (1968), forests found in the sacred grove are of the ***Type 8B/C2 Khasi Sub-Tropical Wet Hill Forest.***

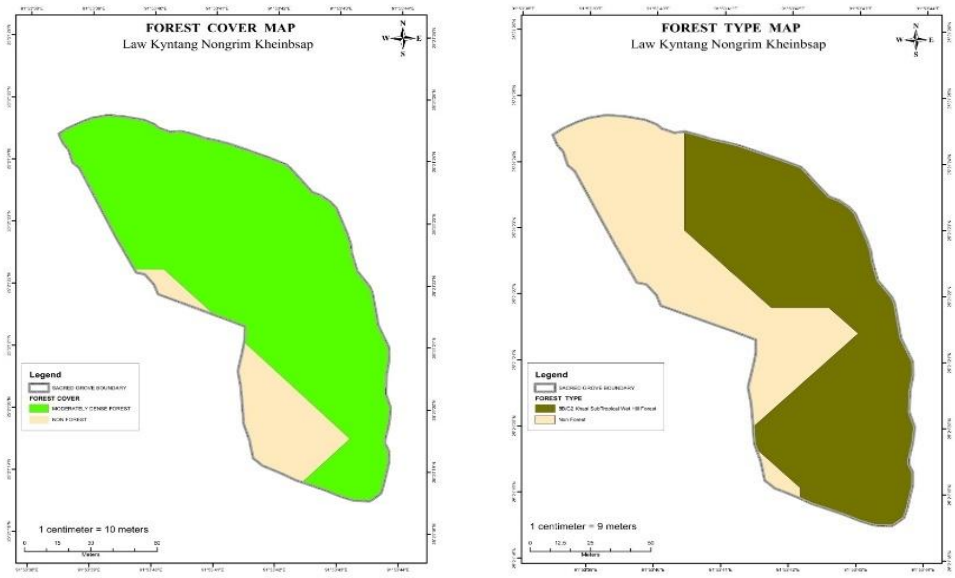
3.13.5 Forest Cover

As per the India State of Forest Report-2021 published by the Forest Survey of India, Dehradun Forest cover in the *Law Kyntang Nongrim Kheinbsap* is as below:

Forest Cover	**Area (ha.)**	**% of total Area**
Very Dense Forest (> 70%)	0	0
Moderately Dense Forest (40 %-70 %)	1.23	86.33
Open Forest (10% - 40%)	0	0
Scrub Forest (<10%)	0	0
Non-Forest	0.20	14.21
Total	**1.43**	**100**







3.13.6 Flora and Fauna

The *Law Kyntang Nongrim Kheinbsap* is home to moderately dense forest of natural origin with two blank patches. *Castanopsis indica* and *Eugenia jambolana* are respectively the 1st and 2nd dominant tree species. Some rare, endangered and endemic plant species naturally exist in this forest.

3.13.6.1 Foral species

Table 3.13.1: Trees found in *Law Kyntang Nongrim Kheinbsap*

Sl No.	Local Name	Botanical Name	Family
1.	*Dieng sohriew*	*Albizia procera*	*Fabaceae*
2.	*Dieng latymphu*	*Aralia armata*	*Araliaceae*
3.	*Dieng lieng*	*Betula alnoides*	*Betulaceae*
4.	*Dieng tlai*	*Caryota urens*	*Arecaceae*
5.	*Dieng sohot*	*Castanopsis indica*	*Fagaceae*
6.	*Dieng tyrthia*	*Cinnamomum pauciflorum*	*Lauraceae*
7.	*Dieng pingwait*	*Cinnamomun glaucescens*	*Lauraceae*
8.	*Dieng soh riew*	*Ciox lacryma-jobi*	*Poaceae*
9.	*Dieng lasaw*	*Elaeocarpus robusta*	*Elaeocarpaceae*
10.	*Dieng lba*	*Engelhardia spicata*	*Juglandiaceae*
11.	*Dieng song*	*Erythrina indica*	*leguminoceae*
12.	*Dieng sohum*	*Eugenia jambolana*	*Myrtaceae*
13.	*Dieng doh*	*Exbucklandia populnea*	*Hamamelidaceae*
14.	*Dieng samehblang*	*Grevia abutilifolia*	*Tiliaceae*
15.	*Dieng jali*	*Ilex gadajam*	*Aquifoliaceae*
16.	*Dieng sohsyrted*	*Itea chinensis*	*Iteaceae*
17.	*Dieng sohrang maw*	*Litsea meissneri*	*Lauraceae*

18.	*Dieng tymbuh ladew*	*Lithocarpus fenestratus*	*Fagaceae*
19.	*Dieng sohrang*	*Litsea meissneri*	*Lauraceae*
20.	*Dieng lalieh*	*Machilus praviflora*	*Lauraceae*
21.	*Dieng sohiong*	*Mahonia acanthifolia*	*Beriberidaceae*
22.	*Dieng laniar*	*Michelia oblonga*	*Magnoliaceae*
23.	*Dieng sohniar*	*Michelia punduana*	*Magnoliaceae*
24.	*Dieng jalngap*	*Saurauia punduana*	*Actinidiaceae*
25.	*Dieng latyngkieng*	*Schefflera wallichiana*	*Araliaceae*
26.	*Dieng tyrkhang*	*Sphaeropteris cooperi*	*Cyatheaceae*
27.	*Dieng tluh*	*Sterculia villosa*	*Malvaceae*
28.	*Dieng dpei*	*Symplocos thefolia*	*Symplocaceae*
29.	*Dieng lwai*	*Syzygium aquecum*	*Myrtaceae*
30.	*Dieng sohlang shyieng*	*Vibyrnum foetidum*	*Viburnaceae*
31.	*Dieng jasaw*	*Wendlandia wallichii*	*Rubiaceae.*

Table 3.13.2: Shrubs found in *Law Kyntang Nongrim Kheinbsap*

Sl No.	Local Name	Botanical Name	Family
1.	*Dieng tyrnem synrang*	*Camellia candata*	*Theaceae*
2.	*Dieng duma sla*	*Nicotiana labacum*	*Solanaceae*
3.	*Dieng tyrnem bhai*	*Camellia kissi*	*Theaceae*
4.	*Japung*	*Phragmites karka*	*Poaceae*
5.	*Dieng jalynsim*	*Debregeasia longifolia*	*Urticaceae*
6.	*Jalynnoh*	*Polygonum chinense*	*Polygonaceae*

Table 3.13.3: Herbs found in *Law Kyntang Nongrim Kheinbsap*

Sl No.	Local Name	Botanical Name	Family
1.	*Jalngap iong*	*Inula cappa*	*Asteraceae*
2.	*Dieng duma sla*	*Nicotiana labacum*	*Solanaceae*
3.	*Jangew*	*Emilia sonchifolia*	*Asteraceae*
4.	*Dieng jalynsim*	*Debregeasia longifolia*	*Urticaceae*
6.	*Synrai khlaw*	*Alpinia spp.*	*Gingiberaceae*
7.	*Lashing*	*Curcuma aromatic*	*Zingiberaceae*

Table 3.13.4: Climbers found in *Law Kyntang Nongrim Kheinbsap*

Sl No.	Local Name	Botanical Name	Family
1.	*Jermi jalynnoh*	*Polygonum chinense*	*Polygonaceae*
2.	*Jermi soh shangkhlor*	*Elaeagnus pyriformis*	*Elaeagnaceae*

3.	*Jermi sohkrot*	*Smilax glabra*	*Smilacaceae*
4.	*Dieng sohmatan/sohpdong*	*Stephania glabra*	*Menispermaceae*

Table 3.13.5: Grasses found in *Law Kyntang Nongrim Kheinbsap*

Sl No.	Local Name	Botanical Name	Family
1.	*Phlang thyrnia*	*Arundinella pumila*	*Poaceae*
2.	*Phlang ot*	*Juncus effuses*	*Juncaceae*
3.	*Phlang tylli*	*Arundinella khasiana*	*Poaceae*

Table 3.13.6: Bamboo found in *Law Kyntang Nongrim Kheinbsap*

Sl No.	Local Name	Botanical Name	Family
1.	*Seij skem*	*Bambusa pallida*	*Poaceae*

3.13.6.2 Faunal Species

No scientific study to assess presence and abundance of wildlife in Law *Kyntang Nongrim Kheinbsap* has been carried out so far. However, as per the local residents, presence of some wild animals such are jungle fowls, jackals and numerous vertebrates and invertebrates has been reported in this forest.

3.13.7 Growing Stock

As per the methodology described in Chapter-II, enumeration was carried out in 100 % area of the forest as its area is less than 2 ha. All the trees, having girth (over bark) at breast height more than 30 cm, were enumerated by measuring the top height (in meters) and the girth (in centimetres) at breast height. Data collected during the enumeration were entered in Sacred Groves Description Form and Plot Enumeration Form. During the enumeration total 401 trees were found. These includes 133 *Castanopsis indica* (1st dominant), 93 *Eugenia jambolana* (2nd dominant), 56 *Machilus praviflora* (3rd dominant) and 401 trees of rest of species. Using the Local Volume Equations given in Chapter –II, girth classes wise volume was calculated for each tree species for each of the 13 girth classes starting from 30-40 cm to 151 cm and above. Details of the same are given in the Table: 3.13.7 below. As may be seen, total growing stock in this forest is 316.07 cubic metres.

Table 3.13.7: Species-wise distribution of growing stock in different girth classes in the entire forest

(cum)

Girth Class (cm)	*Castanopsis indica* (1st dominant)	*Eugenia jambolana* (2nd dominant)	*Machilus praviflora* (3rd dominant)	Rest of the species	Total	% of total growing stock
30-40	1.05	0.75	0.12	0.63	**2.55**	0.81
41-50	1.54	2.28	0.00	2.25	**6.07**	1.92
51-60	4.18	3.63	1.12	6.59	**15.52**	4.91

61-70	7.70	5.98	4.08	6.20	**23.96**	7.58
71-80	6.63	5.66	2.85	7.60	**22.74**	7.19
81-90	6.44	4.15	7.61	7.95	**26.15**	8.27
91-100	9.30	5.66	5.37	5.33	**25.66**	8.12
101-110	12.95	2.15	4.52	2.22	**21.84**	6.91
111-120	15.27	7.85	7.15	5.77	**36.04**	11.40
121-130	8.10	1.50	3.33	8.07	**21.00**	6.64
131-140	0.00	0.00	2.04	4.08	**6.12**	1.94
141-150	6.83	2.29	0.00	6.64	**15.76**	4.99
151 & above	18.79	10.21	38.65	25.01	**92.66**	29.32
Total	**98.78**	**52.11**	**76.84**	**88.34**	**316.07**	**100.00**
% of total growing stock	**31.25**	**16.49**	**24.31**	**27.95**	**100.00**	

As may be seen, 31.25 % of the total growing stock is contributed by the 1st dominant species (*Castanopsis indica).* The 2nd dominant species (*Eugenia jambolana*) constitutes 16.49 % of the total growing stock. Similarly, the 3rd dominant species *(Machilus praviflora)* constitutes 24.31% of the total growing stock. A significant part of the growing stock (*i.e* 27.95 %) is constituted by the rest of the species.

Figure 3.13.1:Girth class-wise distribution of the growing stock

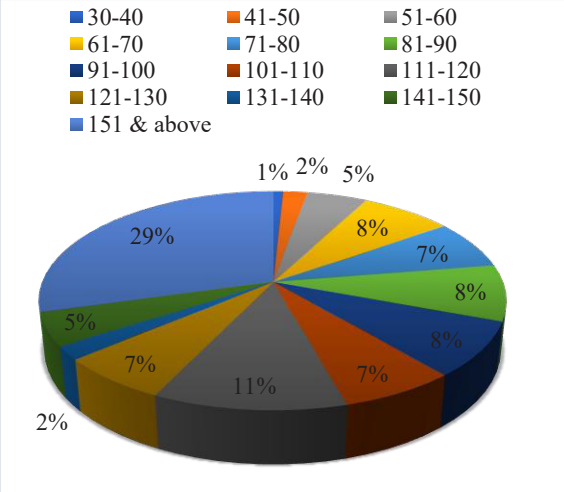


Figure 3.13.2: Species-wise distribution of growing stock

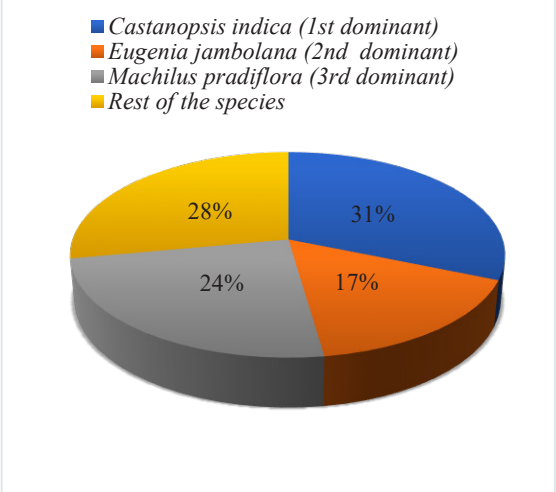


Figure 3.13.3:Girth class-wise distribution of the growing stock

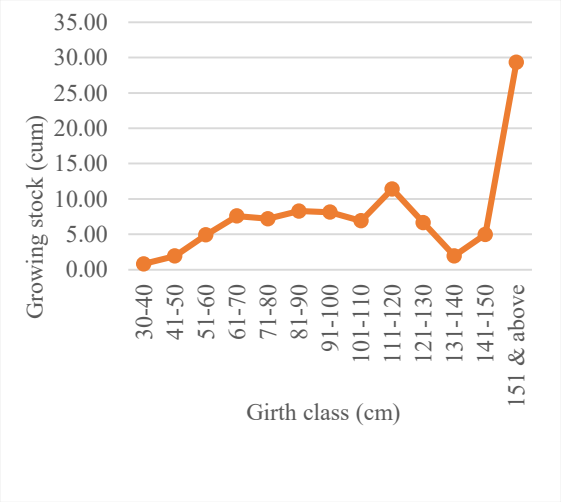


Figure 3.13.4: Overview *Law Kyntang Nongrim Kheinbsap*



3.13.8 Number of Stems

Species-wise number of stems in each girth class are given in Table 3.13.8 below. As may be seen, maximum numbers of stems are found in lower girth classes *i.e.* from 30-40 cm to 71-80 cm. Number of stems are more or less inversely proportional to mid-diameter of the girth class.

Table 3.13.8: Species-wise number of stems in different girth classes in the entire forest

(numbers of stems)

Girth Class (cm)	*Castanopsis indica* (1st dominant)	*Eugenia jambolana* (2nd dominant)	*Machilus praviflora* (3rd dominant)	Rest of the species	Total
30-40	18	15	3	10	46
41-50	11	16	0	15	42
51-60	17	13	4	25	59
61-70	19	15	10	15	59
71-80	12	10	5	14	41
81-90	9	6	10	11	36
91-100	10	6	6	6	28
101-110	12	2	4	2	20
111-120	11	6	5	4	26
121-130	5	1	2	5	13
131-140	0	0	1	2	3

141-150	3	1	0	3	7
151 & above	6	2	6	7	21
Total	**133**	**93**	**56**	**119**	**401**

Figure 3.13.5: Number of stems in different girth classes

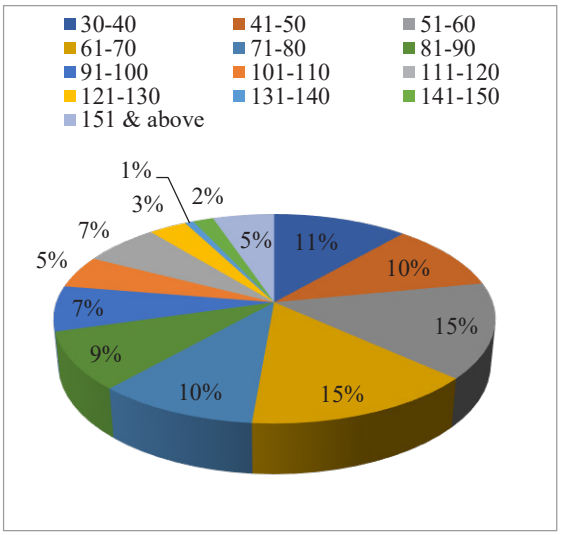


Figure 3.13.6: Species-wise distribution of stem

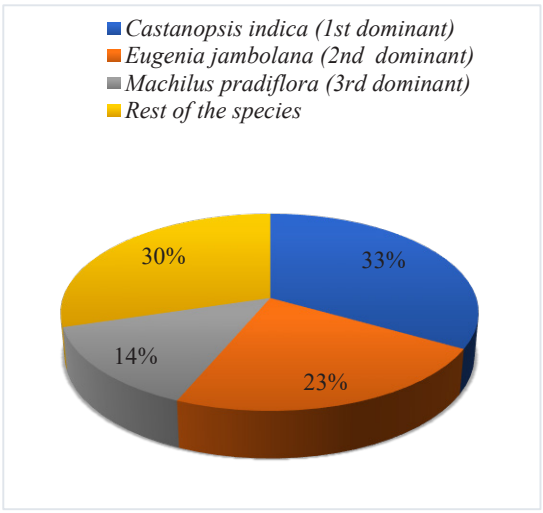


Figure 3.13.7:Number of stems in different girth classes

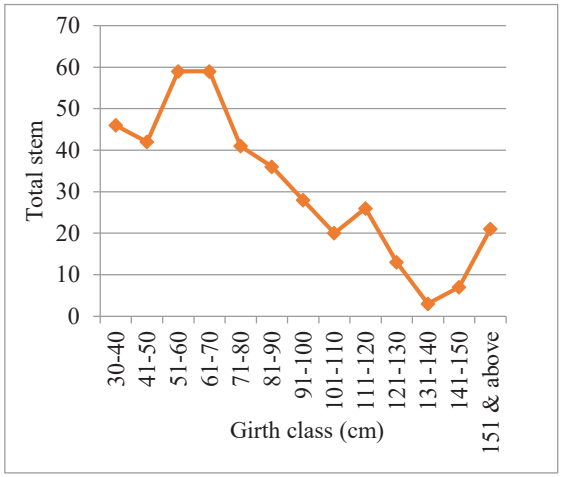
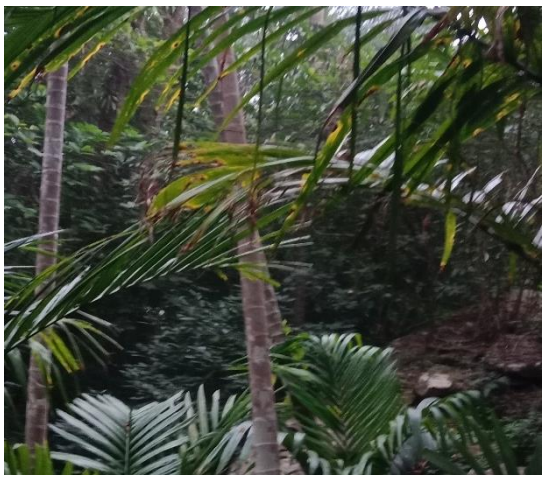


Figure 3.13.8: Inside view *Law Kyntang Nongrim Kheinbsap*



3.13.9 Prescriptions for Future Management

3.13.9.1 Registration with the Khasi Hills Autonomous District Council

The United Khasi-Jaintia Hills Autonomous District (Management and Control of Forests) Rules, 1960 provides for registration of each *Law Adong/Law Kyntang* located in areas falling under jurisdiction of the Khasi Hills Autonomous District Council (KHADC). Though these rules came into force about 65 years ago, the *Law Kyntang Nongrim Kheinbsap* has not been registered with the KHADC. The Chief Forest Officer of the KHADC and the Village *Dorbar* of *Nongrim Kheinbsap* village may take immediate necessary actions, as provided in Chapter-I of the said rules to register the *Law Kyntang Nongrim Kheinbsap* with the KHADC. The same will accord legal recognition and protection from diversion for non-forestry purposes.

3.13.9.2 Notification as Community Reserve

Section 38C of the Wild Life (Protection) Act, 1972 provides that the State Government may, where the community or an individual has volunteered to conserve wild life and its habitat, declare any private or community land not comprised within a National Park, Wildlife Sanctuary or a Conservation Reserve, as a Community Reserve, for protecting fauna, flora and traditional or cultural conservation values and practices. Notification of an area as a Community Reserve accords it legal protection. It also makes it eligible to receive financial assistance under a Centrally Sponsored Scheme of 'Integrated Development of Wildlife Habitats'. The *Dorbar* of *Law Kyntang Nongrim Kheinbsap* and Wildlife Wing in the Forest and Environment Department, Government of Meghalaya may therefore take necessary actions for notification of the *Law Kyntang Nongrim Kheinbsap* as a Community Reserve.

3.13.9.3 Boundary Demarcation

Boundary of the *Law Kyntang Nongrim Kheinbsap* has not been physically demarcated on the ground. A PWD Road bounds it in the South-West. To prevent and to ensure early detection of encroachments, boundary of the *Law Kyntang Nongrim Kheinbsap*, wherever it is not constituted by features of permanent nature may be demarcated by erection of RCC boundary pillars and painting of rings on stem of trees standing on the boundary.

3.13.9.4 Fire Protection

As per the Meghalaya Forest Fire Information System developed by the North Eastern Space Application Centre (NESAC), during a period of 22 years (2002 -2024) no fire incident has occurred in the *Law Kyntang Nongrim Kheinbsap*. As per the said System a major part of the *Law Kyntang Nongrim Kheinbsap* is moderately to highly vulnerable to forest fire. Similarly, as per the said information system, a significant part of the *Law Kyntang Nongrim Kheinbsap* is prone to forest fires. To prevent damage to the *Law Kyntang Nongrim Kheinbsap* from accidental forest fire, measures such as creation and periodic cleaning of fire line along the periphery and at critical locations within the *Law Kyntang Nongrim Kheinbsap* and engagement of fire watchers during the critical months may be taken.

3.13.9.5 Construction of Soil Moisture Conservation and Water Harvesting Structures

As no stream or river flows through this forest, the only way to improve moisture regime in is undertaking soil and water conservation measures such as check dams and contour trench across the slope at suitable locations. Improved water regime will attract wildlife and will also promote natural regeneration.

3.13.9.6 Creation of Eco-Tourism Facilities

To create awareness about rich biodiversity of the *Law Kyntang Nongrim Kheinbsap* and also to create livelihood opportunities for local residents, eco-tourism facilities such as rain shelter cum view point, footpath/ walking trail, sign board, washrooms *etc.* may be constructed to attract visitors.

3.13.9.7 Restocking of Degraded Areas

Efforts may be made to restock the degraded patches in *Law Kyntang Nongrim Kheinbsap* by assisting and promoting natural regeneration of native species. Areas which cannot be naturally regenerated may be afforested by planting seedlings of native species.

3.13.9.8 Formulation of A Proposal and Registration Thereof on Carbon Registry to Earn Carbon Credits

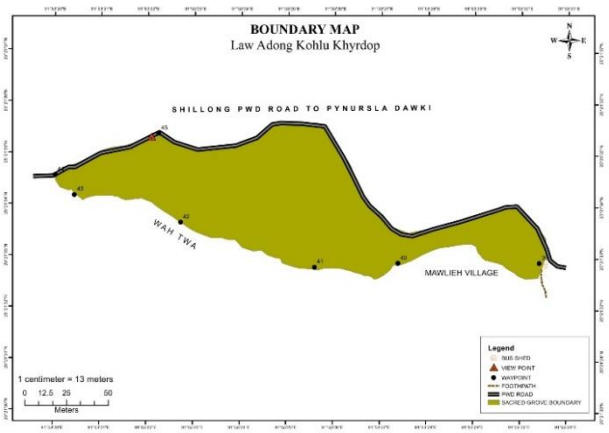
To reward the local communities for their efforts in conservation and protection of *Law Kyntang Nongrim Kheinbsap* for centuries, a proposal may be formulated and registered on an appropriate carbon registry to earn carbon credits for measures to be taken by the local communities for better protection and conservation of the *Law Kyntang Nongrim Kheinbsap*.

3.13.9.9 Awareness Campaign

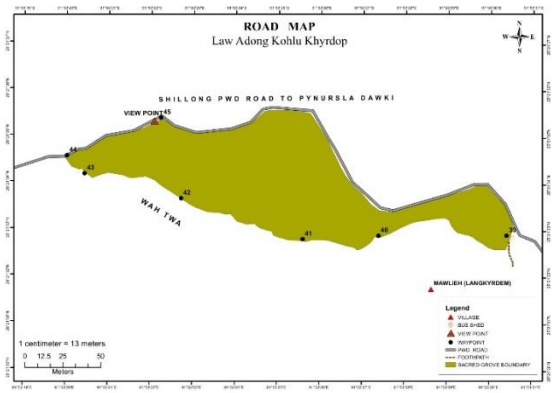
The *Law Kyntang Nongrim Kheinbsap* has been protected by the local communities for centuries for spiritual, ecological and cultural beliefs. With gradual subordination of these principles, local communities' concern for conservation and protection of sacred groves and other community owned forests is gradually eroding. The same therefore needs to be revived and reinforced by creating awareness among the local communities and grassroot level institutions about cultural, ecological, heritage and economic importance of sacred groves and other community owned forests.

3.14. *LAW ADONG KOHLU KHYRDOP*

3.14.1 Location

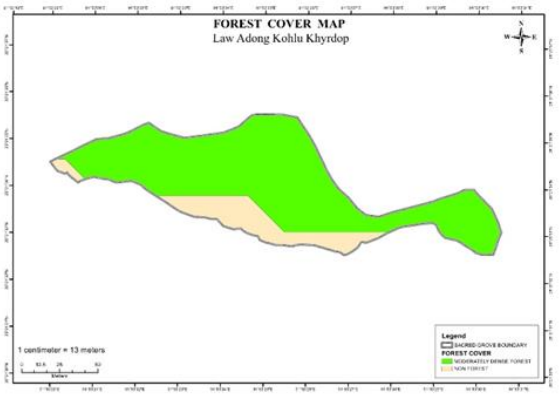


Law Adong Kohlu Khyrdop is situated in East Khasi Hills District at *Mawlieh* village of *Raid Mawlieh* under *Hima Khyrim* Syiemship. It covers an area of 1.19 ha and lies between 91° 53′ 20″ E to 91° 53′ 33″ E longitude and 25° 21′ 33″ N to 25° 21′ 35″ N latitude at an altitude of 1,539 m from mean sea level. The Grove is bounded in the North-East and North-West by a PWD road, Shillong-*Pynursla-Dawki* road and in the South-West and South-East by *Wah Twa* and *Mawlieh* Village. The grove is accessible by Shillong by an all weather motorable road. It is located at a distance of about 39 km from Shillong.





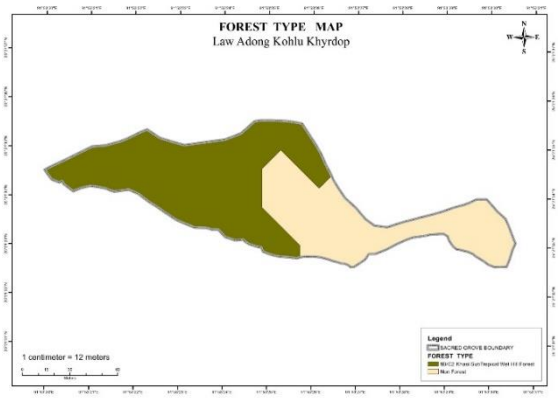
3.14.2 Brief History

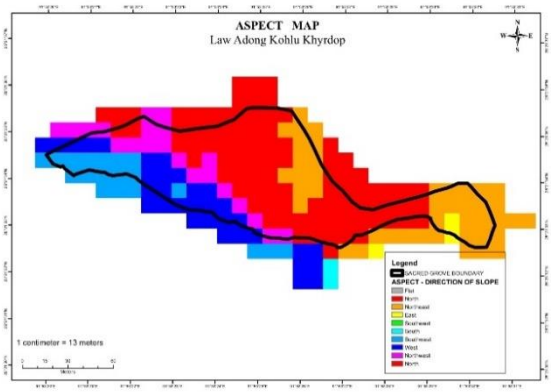


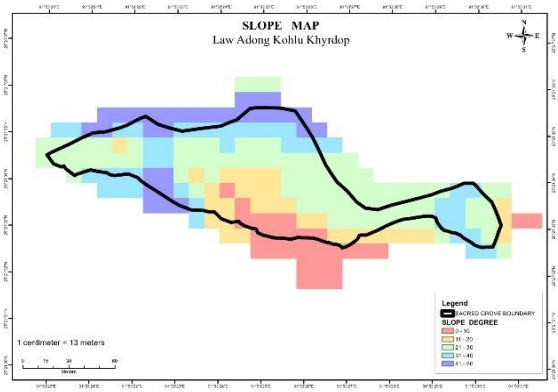
Law Adong Kohlu Khyrdop is in existence for several decades. Offering and prayer has ceased long back since local population embraced Christianity. The *Law Adong* is managed by the local residents through Dorbar headed by the Headman of the *Raid Mawlieh*. In the past local residents believe that this grove was an abode of local deities. It is still preserved for the the environment benefits as this is a biodiversity rich habitat. Biotic pressures such as encroachments, hunting, poaching and illegal felling of trees are absent in this forest.

3.14.3 Geography and Climate

The topography of this Law Adong is hilly in nature with slope varying from 10° to 45°. A major part of the grove falls under Northern and North-east aspects. The remaining part falls in the Western aspect. The soil texture is sandy with gravels and coarse fragments. Soil consistency is friable. The soil is brown in colour and of medium depth.







Winter season starts from end of October and lasts till March of the next year. It receives higher rainfall during the monsoon season from April to September. Average temperature varies from 6°C to 25°C.

3.14.4 Forest Type

As per the Champion and Seth classification (1968), forests found in the sacred grove are of the ***Type 8B/C2 Khasi Sub-Tropical Wet Hill Forest.***

3.14.5 Forest Cover

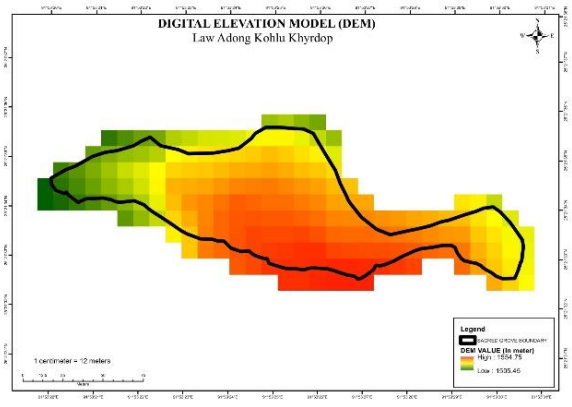
As per the India State of Forest Report-2021 published by the Forest Survey of India, Dehradun Forest cover in the *Law Adong Kohlu Khyrdop i*s as below:

Forest Cover	Area (ha.)	% of total Area
Very Dense Forest (> 70%)	0	0
Moderately Dense Forest (40 %-70 %)	0.99	83.16
Open Forest (10% - 40%)	0	0
Scrub Forest (<10%)	0	0

Non-Forest	0.20	16.84
Total	**1.19**	**100**

3.14.6 Flora and Fauna

The *Law Adong Kohlu Khyrdop* is home to moderately dense forest of natural origin. *Castanopsis indica* and *Eugenia praecox* are respectively the 1st *and* 2nd dominant tree species. Some rare, endangered and endemic plant species exist in this grove.



3.14.6.1 Floral species

Table 3.14.1: Trees found in *Law Adong Kohlu Khyrdop*

Sl No.	Local Name	Botanical Name	Family
1.	*Dieng jasaw*	*Albizia odoratissima*	*Mimosaceae*
2.	*Dieng phyllud*	*Albizia spp*	*Fabaceae*
3.	*Dieng sohriew*	*Albizzia procera*	*Fabaceae*
4.	*Dieng jyrtieng*	*Alstonia scholaris*	*Apocynaceae*
5.	*Dieng latymphu*	*Aralia armata*	*Araliaceae*
6.	*Dieng lieng*	*Betula alnoides*	*Betulaceae*
7.	*Dieng tyrnem*	*Camelia caducca*	*Fagaceae*
8.	*Dieng sning*	*Castanopsis armata*	*Fagaceae*
9.	*Dieng stap*	*Castanopsis hystrix*	*Fagaceae*
10.	*Dieng sohot*	*Castanopsis indica*	*Fagaceae*
11.	*Dieng siasia*	*Celtis tetrandra*	*Cannabaceae*
12.	*Dieng latyrdop*	*Cinnamomum bejolghota*	*Lauraceae*
13.	*Dieng torthia*	*Cinnamomum pauciflorum*	*Lauraceae*
14.	*Dieng sai-sai*	*Cinnamomum tamala*	*Lauraceae*
15.	*Dieng sohriew*	*Ciox lacryma-jabi*	*Poaceae*
16.	*Dieng coffi khlaw*	*Coffea khasiana*	*Rubiaceae*
17.	*Dieng sohkhyllam*	*Elaeocarpus lanceifolius*	*Elaeocarpaceae*
18.	*Dieng sohkhmi (lasaw)*	*Elaeocarpus robusta*	*Elaeocarpaceae*
19.	*Dieng lba*	*Engelhardtia spicata*	*Juglandiaceae*
20.	*Dieng sohum*	*Eugenia praecox*	*Myrtaceae*
21.	*Dieng doh*	*Exbucklandia populnea*	*Hamamelidaceae*

22.	*Dieng soh kwang*	*Garcinia armata*	*Guttiferae*
23.	*Dieng sohum riphin*	*Glochidion spp*	*Phyllanthaceae*
24.	*Dieng riphin*	*Glochidion sphaerogynum*	*Phyllanthaceae*
25.	*Dieng sohmeblang*	*Grewia abutilifolia*	*Tiliaceae*
26.	*Dieng sohlarmaw*	*Ilex spp*	*Aquifoliaceae*
27.	*Dieng sohlalieh*	*Inula cappa*	*Asteraceae*
28.	*Dieng sohsyrtet*	*Itea chinensis*	*Iteaceae*
29.	*Dieng sohrang*	*Litsea meissneri*	*Lauraceae*
30.	*Dieng sohniar*	*Machilus parviflora*	*Lauraceae*
31.	*Dieng krot*	*Meliosma pinnata*	*Sabiaceae*
32.	*Dieng rai lieh*	*Michelia champaca*	*Magnoliaceae*
33.	*Dieng sohniar*	*Michelia oblonga*	*Magnoliaceae*
34.	*Dieng sohphie*	*Myrica esculenta*	*Myricaceae*
35.	*Dieng shlan*	*Pandanus american*	*Pandanaceae*
36.	*Dieng tyllong Rangsei*	*Pantapanox racemasmum*	*Davalliaceae*
37.	*Dieng latyngkieng*	*Rauvolfia densiflora*	*Apocynaceae*
38.	*Dieng jalngap*	*Saurauia punduana*	*Actinidiaceae*
39.	*Dieng latyngkien*	*Schefflera wallichinia*	*Araliaceae*
40.	*Dieng ngan*	*Schima khasiana*	*Theaceae*
41.	*Dieng tyrkhang*	*Sphaeropteris cooperi*	*Cyatheaceae*
42.	*Dieng dpei*	*Symplocos theaefolia*	*Symplocaceae*

Table 3.14.2: Shrubs found in *Law Adong Kohlu Khyrdop*

Sl No.	Local Name	Botanical Name	Family
1.	*Dieng tluh*	*Sterculia villosa*	*Malvaceae*
2.	*Dieng lari-ria*	*Cinnamomum spp*	*Lauraceae*
3.	*Dieng pyrshitiong*	*Diospyros lotus*	*Ebenaceae*

Table 3.14.3: List of Herbs found in *Law Adong Kohlu Khyrdop*

Sl No.	Local Name	Botanical Name	Family
1.	*Thyrkhang maw*	*Cyathea gigantea*	*Cyatheaceae*
2.	*Tyrkhang khlaw*	*Asplenium nidus*	*Aspleniaceae*
3.	*Sying khlaw*	*Zingiber purpureum*	*Zingiberaceae*

Table 3.14.4: Climbers found in *Law Adong Kohlu Khyrdop*

Sl No.	Local Name	Botanical Name	Family
1.	*Jermi khlaw*	*Pisonia aculeate*	*Nyctaginaceae*

2.	*Jermi ruin*	*Derris elliptica*	*Fabaceae*
3.	*Jyrni pur*	*Cocculus hirsutus*	*Menispermaceae*

Table 3.14.5: Grasses found in *Law Adong Kohlu Khyrdop*

Sl No.	Local Name	Botanical Name	Family
1.	*Synsar*	*Thysanolaena maxima*	*Poaceae*
2.	*Phlang traw*	*Imperata cylindrica*	*Poaceae*
3.	*Phlang tylli*	*Arundinella khasiana*	*Poaceae*
4.	*Phlang phot*	*Juncus effusus*	*Poaceae*

Table 3.14.6: Ferns found in *Law Adong Kohlu Khyrdop*

Sl No.	Local Name	Botanical Name	Family
1.	*Tyrkhang maw*	*Cyathea gigantean*	*Cyatheaceae*
2.	*Tyrkhang syieng*	*Adiantum raddianum*	*Pteridaceae*
3.	*Tyrkhang nar*	*Lophosoria quadripinnata*	*Dicksoniaceae*
4.	*Tyrkhang*	*Polypodium spp*	*Polypodiaceae*

3.14.6.2 Faunal Species

No scientific study to assess presence and abundance of wildlife in *Law Adong Kohlu Khyrdop* has been carried out so far. However, as per the local residents, presence of some wild animals such are jungle fowls, jackals and numerous vertebrates and invertebrates has been reported in this forest.

3.14.7 Growing Stock

As per the methodology described in Chapter-II, enumeration was carried out in 100% area of the forest as its area is less than 2 ha. All the trees, having girth (over bark) at breast height more than 30 cm were enumerated by measuring the top height (in meters) and the girth (in centimetres) at breast height. Data collected during the enumeration were entered in Sacred Groves Description Form and Plot Enumeration Form. During the enumeration total 874 trees were found. These includes 480 *Castanopsis indica* (1stdominant), 84 *Eugenia praecox* (2nddominant), 52 *Cinnamomum pauciflorum* (3rddominant) and 618 trees belonging to rest of species. Using the Local Volume Equations given in Chapter –II, girth classes wise volume was calculated for each tree species for each of the 13 girth classes starting from 30-40 cm to 151 cm and above. Details of the same are given in the Table: 3.14.7 below. As may be seen, total growing stock in this forest is 469.98 cubic metres.

Table 3.14.7: Species-wise distribution of growing stock in different girth classes in the entire forest

(cum)

Girth Class (cm)	*Castanopsis indica* (1st dominant)	*Eugenia praecox* (2nd dominant)	*Cinnamomum pauciflorum* (3rd dominant)	Rest of the species	Growing stock	% of total growing stock
30-40	2.56	0.70	0.93	2.95	**7.14**	1.52
41-50	10.06	1.28	0.81	6.76	**18.91**	4.02
51-60	16.52	3.97	0.88	7.50	**28.87**	6.14
61-70	36.87	3.57	0.66	10.75	**51.85**	11.03
71-80	31.49	4.90	0.99	13.16	**50.54**	10.75
81-90	32.16	3.30	0.40	12.77	**48.63**	10.35
91-100	38.00	0.00	2.08	9.28	**49.36**	10.50
101-110	15.63	3.36	1.37	9.23	**29.59**	6.30
111-120	17.71	5.55	0.85	9.32	**33.43**	7.11
121-130	11.59	0.00	1.13	5.02	**17.74**	3.77
131-140	9.33	3.63	0.00	7.59	**20.55**	4.37
141-150	4.23	0.00	0.00	11.25	**15.48**	3.29
151 & above	12.34	68.59	0.00	16.96	**97.89**	20.83
Total	**238.49**	**98.85**	**10.10**	**122.54**	**469.98**	100.00
% of Total growing stock	**50.74**	**21.03**	**2.15**	**26.07**	**100.00**	

As may be seen, 50.74 % of the total growing stock is contributed by the 1st dominant species (*Castanopsis indica).* The 2nd dominant species (*Eugenia praecox*) constitutes 21.03 % of the total growing stock. Similarly, the 3rd dominant species *(Cinnamomum pauciflorum)* constitutes 2.15% of the total growing stock. The remaining growing stock (*i.e* 26.07 %) is constituted by the rest of the species.

Figure 3.14.1:Girth class-wise distribution of the growing stock

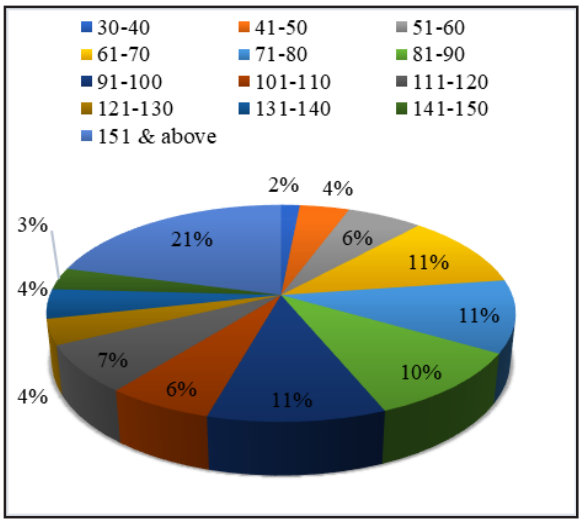


Figure 3.14.2: Species-wise distribution of growing stock

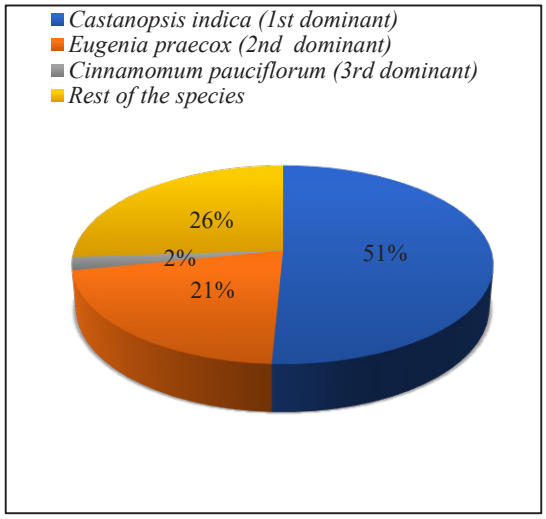


Figure 3.14.3:Girth class-wise distribution of the G.S.

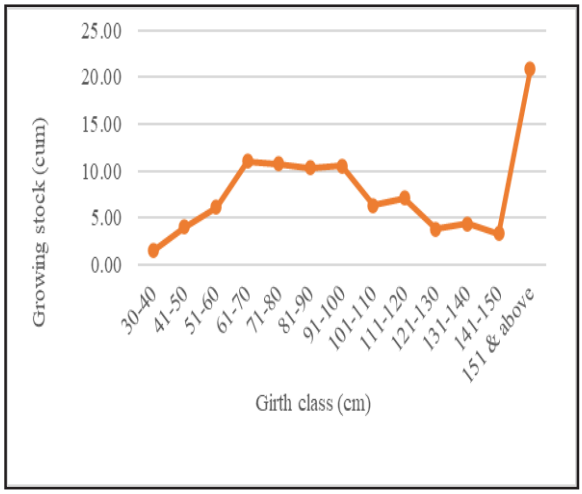


Figure 3.14.4: Overview of *Law Adong Kohlu Khyrdop*



3.14.8 Number of Stems

Species-wise number of stems in each girth class are given in Table 3.14.8 below. As may be seen maximum numbers of stems are found in lower girth classes *i.e.* from 30-40 cm to 71-80 cm. Number of stems are inversely proportional to mid-diameter of the girth class.

Table 3.14.8: Species-wise number of stems in different girth classes in the entire forest

(numbers of stems)

Girth Class (cm)	*Castanopsis indica* (1st dominant)	*Eugenia praecox* (2nd dominant)	*Cinnamomum pauciflorum* (3rd dominant)	Rest of the species	Total
30-40	54	20	16	71	161
41-50	72	9	11	45	137
51-60	64	17	8	31	120
61-70	97	9	4	28	138
71-80	60	9	4	24	97
81-90	46	5	1	18	70
91-100	42	0	4	10	56
101-110	14	3	2	8	27
111-120	13	4	1	7	25
121-130	7	0	1	3	11
131-140	5	2	0	4	11
141-150	2	0	0	5	7
151 & above	4	6	0	4	14
Total	**480**	**84**	**52**	**258**	**874**

Figure 3.14.6:Number of stems in different girth classes

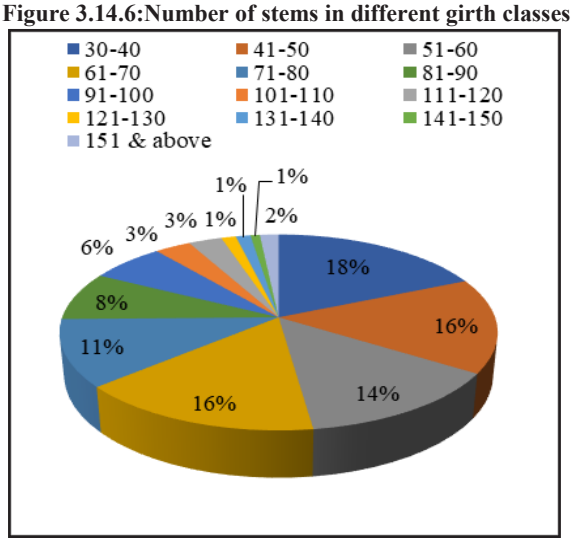


Figure 3.14.7: Species-wise distribution of stems

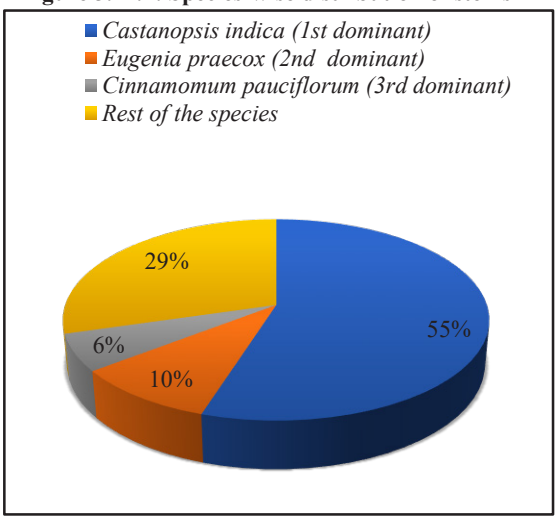


Figure 3.14.8: Number of stems in different girth classes

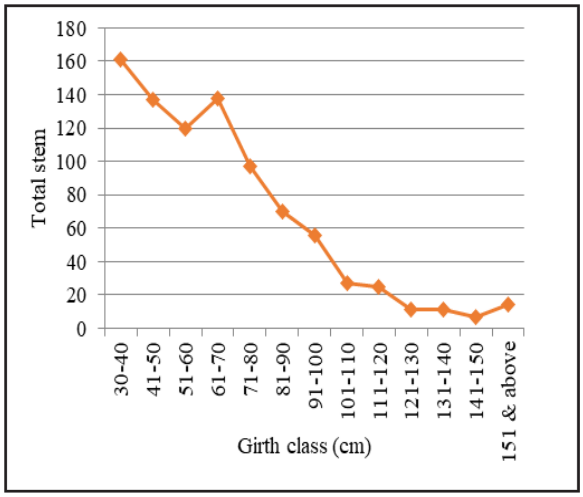


Figure 3.14.9: Inside view of *Law Adong Kohlu Khyrdop*



3.14.9 Prescriptions for Future Management

3.14.9.1 Registration with the Khasi Hills Autonomous District Council

The United Khasi-Jaintia Hills Autonomous District (Management and Control of Forests) Rules, 1960 provides for registration of each *Law Adong/Law Kyntang* located in areas falling under jurisdiction of the Khasi Hills Autonomous District Council (KHADC). Though these rules came into force about 65 years ago, the *Law Adong Kohlu Khyrdop* has not been registered with the KHADC. The Chief Forest Officer of the KHADC and the Village *Dorbar* of *Mawlieh* may take immediate necessary actions, as provided in Chapter-I of the said rules to register the *Law Adong Kohlu Khyrdop* with the KHADC. The same will accord legal recognition and protection from diversion for non-forestry purposes.

3.14.9.2 Notification as a Community Reserve

Section 38C of the Wild Life (Protection) Act, 1972 provides that the State Government may, where the community or an individual has volunteered to conserve wild life and its habitat, declare any private or community land not comprised within a National Park, Wildlife Sanctuary or a Conservation Reserve, as a Community Reserve, for protecting fauna, flora and traditional or cultural conservation values and practices. Notification of an area as a Community Reserve accords it legal protection. It also makes it eligible to receive financial assistance under a Centrally Sponsored Scheme of 'Integrated Development of Wildlife Habitats'. The *Dorbar* of *Mawlieh* Village and Wildlife Wing in the Forest and Environment Department, Government of Meghalaya may therefore take necessary actions for notification of the *Law Adong Kohlu Khyrdop* as a Community Reserve.

3.14.9.3 Boundary Demarcation

Boundary of the *Law Adong Kohlu Khyrdop* has not been physically demarcated on the ground. A PWD Road runs along North-East and Northern boundary of the grove. To prevent and to ensure early detection of encroachments, boundary of the *Law Adong Kohlu Khyrdop*, wherever it is not constituted by features of permanent nature may be demarcated by erection of RCC boundary pillars and painting of rings on stem of trees standing on the boundary.

3.14.9.4 Fire Protection

As per the Meghalaya Forest Fire Information System, during a period of 22 years (2002 - 2024) zero fire incident has occurred in the *Law Adong Kohlu Khyrdop*. As per the Meghalaya Forest Fire Information System developed by the North Eastern Space Application Centre (NESAC) a major part of the *Law Adong Kohlu Khyrdop* is moderately to highly vulnerable to forest fires. However, as per the said information system, the *Law Adong Kohlu Khyrdop* is less prone to forest fires. To prevent damage to the *Law Adong Kohlu Khyrdop* from accidental forest fire, measures such as creation and periodic cleaning of fire line along the periphery and at critical locations within the *Law Adong Kohlu Khyrdop* and engagement of fire watchers during the critical months may be taken.

3.14.9.5 Construction of Soil Moisture Conservation and Water Harvesting Structures

As no stream or river flows through this forest, the only way to improve moisture regime in this forest is undertaking soil and water conservation measures such as check dams and contour trench across the slope at suitable locations. Improved water regime will help in attracting wildlife.

3.14.9.6 Creation of Eco-Tourism Facilities

To create awareness about rich biodiversity of the *Law Adong Kohlu Khyrdop* and also to create livelihood opportunities for local residents, eco-tourism facilities such as rain shelter, footpath/ walking trail, sign board, washrooms *etc.* may be constructed to attract tourists. It was observed that viewpoint cum watchtower at this site is necessary as this will facilitate attracting visitors to this site.

3.14.9.7 Restocking of Degraded Areas

Efforts may be made to restock the open degraded patches in *Law Adong Kohlu Khyrdop* by assisting and promoting natural regeneration of native species. Areas which cannot be naturally regenerated may be afforested by planting seedlings of native species.

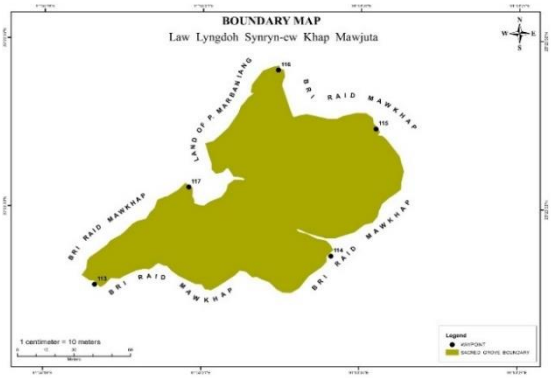
3.14.9.8 Formulation of A Proposal and Registration Thereof on Carbon Registry to Earn Carbon Credits

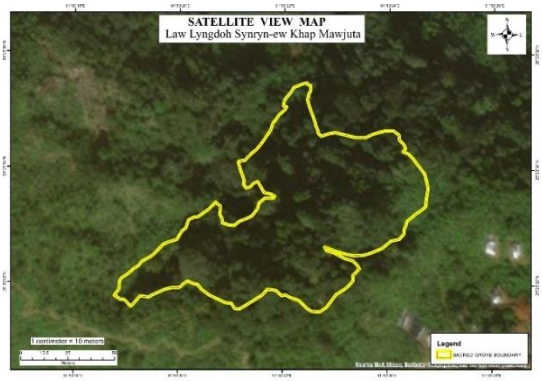
To reward the local communities for their efforts in conservation and protection of *Law Adong Kohlu Khyrdop* for centuries, a proposal may be formulated and registered on an appropriate carbon registry to earn carbon credits for measures to be taken by the local communities for better protection and conservation of the *Law Adong Kohlu Khyrdop*.

3.14.9.9 Awareness Campaign

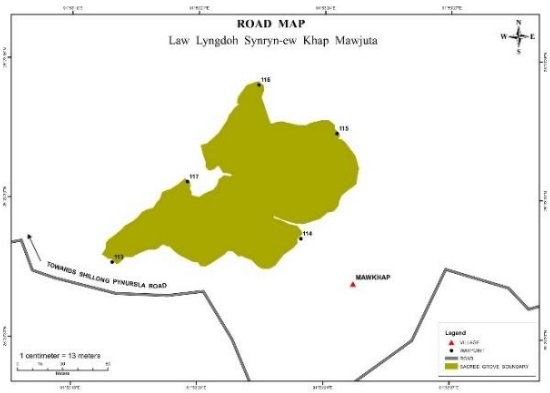
The *Law Adong Kohlu Khyrdop* has been protected by the local communities for centuries for spiritual, conservation and cultural beliefs. With gradual subordination of these principles, local communities' concern for conservation and protection of sacred groves and other community owned forests is gradually declining. The same therefore needs to be revived and reinforced by creating awareness among the local communities and grassroot level institutions about cultural, heritage and economic importance of sacred groves and other community owned forests.

3.15. *LAW LYNGDOH SYNRYN-EW KHAP MAWJUTA*



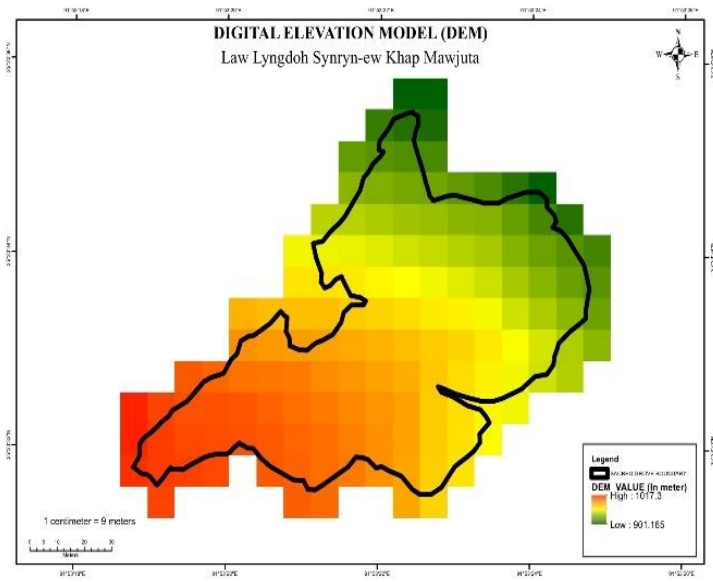


3.15.1 Location



Law Lyngdoh Synryn-ew Khap Mawjuta is located in East Khasi Hills District at *Mawkhap* village in *Raid Mawkhap* under *Hima Khyrim* Syiemship. It covers an area of 1.017 ha and lies between 91° 53′ 20″ E to 91° 53′ 25″ E longitude and 25° 23′ 32″ N to 25° 23′ 35″ N latitude at an altitude of about 1,013 m from the mean sea level. The grove is bounded in the North-East and South by *Bri Raid Mawkhap* and in the North-West by land of one Shri P. Marbaniang and *Bri Raid Mawkhap*. The grove is accessible by the road from Shillong. From the nearest road head, one needs to track for a small distance to reach the grove.

3.15.2 Brief History



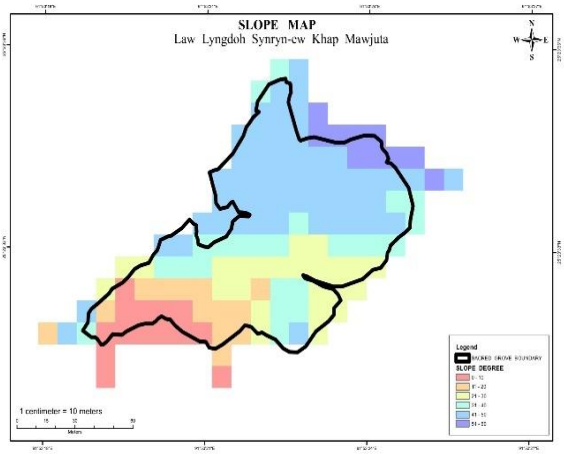
Law Lyngdoh Synryn-ew Khap Mawjuta is in existence since time immemorial. Currently religious rituals are not performed in this grove but villagers still try to preserve this relic forest for environmental benefits as it harbours rich biodiversity. This *Law Adong* is managed by the village community under the lookout and leadership of the Headman (village chief) and the *Raid Mawkhap*.

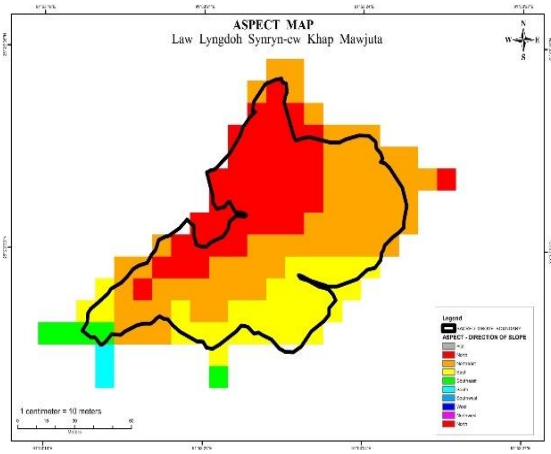
Biotic pressure such as encroachments, hunting, poaching and illegal felling of trees are found to be absent in this forest.

3.15.3 Geography and Climate

The topography of the *Law Lyngdoh* is undulating in nature with slope varrying from 5° to 45°. A major part of the grove falls under the North-East, Eastern and Western aspects. The soil texture is sandy with presence of gravels and coarse fragments. Soil consistency is friable. The soil is brown in colour and of medium depth.

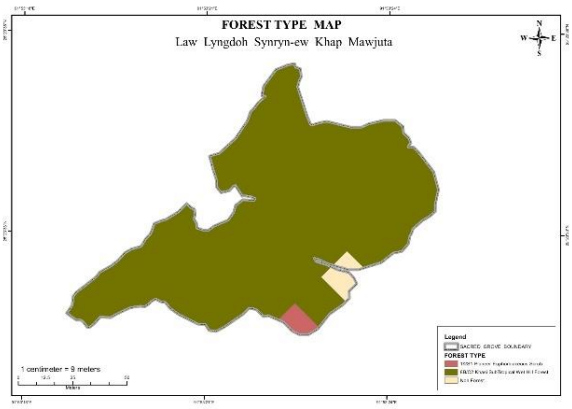
Winter season starts from the end of October and lasts till March of the next year. It receives high rainfall during the monsoon season from April to September. Average temperature varies from 10°C to 28°C.





3.15.4 Forest Type

As per the Champion and Seth classification (1968), forests found in the sacred grove are of the ***Type 8B/C2 Khasi Sub-Tropical Wet Hill Forest*** and ***1/2S1 Pioneer Euphorbiaceous Scrub.***



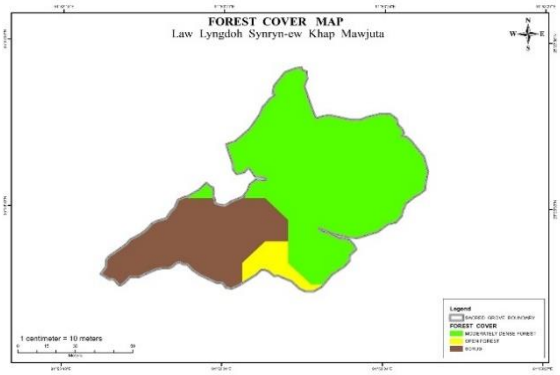
3.15.5 Forest Cover

As per the India State of Forest Report-2021 published by the Forest Survey of India, Dehradun Forest cover in the *Law Lyngdoh Synryn-ew Khap Mawjuta i*s as below:

Forest Cover	Area (ha.)	% of total Area
Very Dense Forest (> 70%)	0	0
Moderately Dense Forest (40 %-70 %)	0.66	65.58
Open Forest (10% - 40%)	0.06	5.84
Scrub Forest (<10%)	0.29	28.92
Non-Forest	0	0
Total	**1.01**	**100**

3.15.6 Flora and Fauna

The *Law Lyngdoh Synrynew Khap Mawjuta* is home to moderately dense, open and scrub forest of natural origin. *Pentapanax racemosus* and *Castanopsis armata* are respectively the 1st and 2nd dominant tree species. Some rare, endangered and endemic plant species are found in this forest.



3.15.6.1 Floral species

Table 3.15.1: Trees found in *Law Lyngdoh Synryn-ew Khap Mawjuta*

Sl No.	Local Name	Botanical Name	Family
1.	*Dieng kreit*	*Albizzia odoratissima*	*Mimosaceae*
2.	*Dieng lakhiat*	*Callicarpa arborea*	*Verbenaceae*
3.	*Dieng sohthombor*	*Cordia dichotoma*	*Boraginaceae*
4.	*Dieng byrniuh*	*Corylopsis himalayana*	*Hammelidaceae*

5.	*Dieng tlai*	*Caryota urens*	*Arecaceae*
6.	*Dieng sning*	*Castanopsis armata*	*Fagaceae*
7.	*Dieng sohot*	*Castanopsis indica*	*Fagaceae*
8.	*Dieng latyrdop*	*Cinnamomum bejolghota*	*Lauraceae*
9.	*Dieng stein*	*Doryxylon albicum*	*Fabaceae*
10.	*Dieng sohbrai/brah*	*Drimycarpus racemosus*	*Anacardaceae*
11.	*Dieng sohlangskei*	*Elaeocarpus spaericus*	*Eleocarpaceae*
12.	*Dieng pdang*	*Ficus ablongifolia*	*Moraceae*
13.	*Dieng jri lapong*	*Ficus lispida*	*Moraceae*
14.	*Dieng lakhain*	*Ficus tinctoria*	*Moraceae*
15.	*Dieng jem*	*Glochidion velutinum*	*Euphobiaceae*
16.	*Dieng sohliang*	*Gynocardia odorata*	*Clusiaceae*
17.	*Dieng jail*	*Ilex godajam*	*Aquifoliaceae*
18.	*Dieng sohpaiat*	*Ligustrum robustum*	*Oleaceae*
19.	*Dieng sohlah*	*Michelia spp*	*Magnoliaceae*
20.	*Dieng phaniaw*	*Michelia spp*	*Magnoliaceae*
21.	*Dieng synri*	*Moinda agustifolia*	*Rubiaceae*
22.	*Dieng sohrynsi*	*Pentapanax racemosus*	*Poaceae*
23.	*Dieng sohlarmaw*	*Photinia integrifolia*	*Rosaceae*
24.	*Dieng sohjadaw*	*Picrasma javanica*	*Simaroubaceae*
25.	*Dieng iap-iar*	*Pithecellobium heterophylum*	*Fabaceae*
26.	*Dieng thylliang*	*Quercus blauca*	*Fagaceae*
27.	*Dieng ngan*	*Schima khasiana*	*Theaceae*
28.	*Dieng sohliwa*	*Syzygium aquecum*	*Myrtaceae*
29.	*Dieng khunswet*	*Wendlandia tinctoria*	*Rubiaceae*

Table 3.15.2: Shrubs found in Law Lyngdoh Synryn-ew Khap Mawjuta

Sl No.	Local Name	Botanical Name	Family
1.	*Dieng pyrshit*	*Eurya acuminate*	*Theaceae*
2.	*Dieng tyrnem shynrang*	*Camelia caudula*	*Theaceae*
3.	*Dieng jalngap iong*	*Inuala cappa*	*Asteraceae*
4.	*Dieng sohja buit*	*Phlogacnthus thyrsiforus*	*Acanthaceae*
5.	*Lajarm lieh*	*Chorodendrum viscosum*	*Lamiaceae*

Table 3.15.3: Herbs found in Law Lyngdoh Synryn-ew Khap Mawjuta

Sl No.	Local Name	Botanical Name	Family
1.	*Jajew maw*	*Begonia spp*	*Begoniaceae*
2.	*Jajrem ieh*	*Clerodendrum viscasum*	*Lamiaceae*
3.	*Latara*	*Alpinia calcarata*	*Zingiberaceae*
4.	*Bat japan*	*Ageratina adenophora*	*Asteraceae*
5.	*Tyrkhang*	*Asplenium nidus*	*Asteraceae*

Table 3.15.4: Bamboos found in Law Lyngdoh Synryn-ew Khap Mawjuta

Sl No.	Local Name	Botanical Name	Family
1.	*Siej skong*	*Bambusa khasiana*	*Poaceae*
2.	*Siej sken*	*Bambusa pallida*	*Poaceae*

Table 3.15.5: Grasses found in Law Lyngdoh Synryn-ew Khap Mawjuta

Sl No.	Local Name	Botanical Name	Family
1.	*Phlang thyrnia*	*Arendenella pumila*	*Poaceae*
2.	*Phlang tylli*	*Arendenella khasiana*	*Poaceae*
3.	*Phlang jem*	*Hedyotis uncinalla*	*Rubeaceae*
4.	*Phlang ot*	*Juncus effuses*	*Juncaceae*

Table 3.15.6: Ferns found in Law Lyngdoh Synryn-ew Khap Mawjuta

Sl No.	Local Name	Botanical Name	Family
1.	*Tyrkhang khlaw*	*Cyathea gigantia*	*Cyatheaceae*
2.	*Tyrkhang maw*	*Cyathea gigantean*	*Cyatheaceae*
3.	*Tyrkhang iong*	*Adiantum raddeanum*	*Pleridaceae*
4.	*Tyrkhng nar*	*Lophosoria quadripinnata*	*Dicksoniaceae,*

3.15.6.2 Faunal Species

No scientific study to assess presence and abundance of wildlife in *Law Lyngdoh Synryn-ew Khap Mawjuta* has been carried out so far. However, as per the local residents, presence of some wild animals such are jungle fowls, jackals and numerous vertebrates and invertebrates has been reported in this forest.

3.15.7 Growing Stock

As per the methodology described in Chapter-II, enumeration was carried out in 100 % area of the forest as its area is less than 2 ha. All the trees having girth (over bark) of more than 30 cm at breast height were enumerated by measuring the top height (in meters) and the girth at breast height (in centimetres). Data collected during the enumeration were entered in Sacred Groves Description Form and Plot Enumeration Form. During the enumeration, data were collected for 232 trees, which include 40 *Pentapanax racemosus* (1st dominant), 26 *Castanopsis armata* (2nd dominant), 18 *Gynocardia odorata* (3rd dominant) and 148 *Rest of Species*. Using the Local Volume Equations given in Chapter –II, girth classes wise volume was calculated for each tree species for each of the 13 girth classes starting from 30-40 cm to 151 cm and above. Details of the same are given in the Table: 3.15.7 below. As may be seen, total growing stock in this forest is 254.20 cubic metres.

Table 3.15.7: Species wise distribution of Growing stock in different girth classes

(cum)

Girth class (cm)	*Pantapanax racemasum* (1st dominant)	*Castanopsis armata* (2nd dominant)	*Gynocardia odorata* (3rd dominant)	Rest of species	Total	% of total growing stock
30-40	0.14	0.07	0.04	0.13	**0.38**	**0.15**
41-50	0.76	0.35	0.11	2.05	**3.27**	**1.29**
51-60	1.10	1.28	0.31	4.69	**7.38**	**2.90**
61-70	5.03	0.00	1.14	7.53	**13.70**	**5.39**
71-80	3.97	2.08	1.67	13.06	**20.78**	**8.17**
81-90	3.47	2.01	0.00	9.18	**14.66**	**5.77**
91-100	2.96	1.91	3.74	8.32	**16.93**	**6.66**
101-110	1.23	3.38	3.40	12.46	**20.47**	**8.05**
111-120	0.00	2.95	0.00	5.55	**8.50**	**3.34**
121-130	0.00	1.75	1.58	21.48	**24.81**	**9.76**
131-140	2.04	1.86	0.00	9.95	**13.85**	**5.45**
141-150	0.00	0.00	0.00	9.15	**9.15**	**3.60**
151 & above	2.35	5.10	6.15	86.72	**100.32**	**39.46**
Total	**23.05**	**22.74**	**18.14**	**190.27**	**254.20**	**100.00**
% of growing stock	9.07	8.95	7.14	74.85	100.00	

As may be seen, 9.07 % of the total growing stock is contributed by the 1st dominant species (*Pantapanax racemasum).* The 2nd dominant species (*Castanopsis armata*) constitutes 8.95 % of the total growing stock. Similarly, the 3rd dominant species *(Gynocardia odorata)* constitutes 7.14% of the total growing stock. A major part of the growing stock (*i.e.* 74.85 %) is constituted by the rest of the species.

Figure 3.15.1:Girth class-wise distribution of growing stock

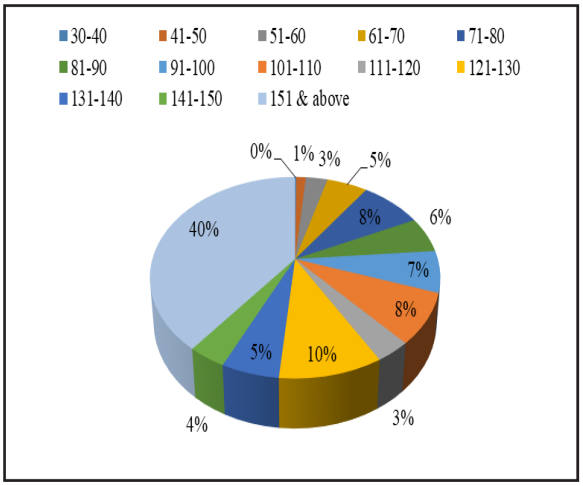


Figure 3.15.2: Species-wise distribution of growing stock

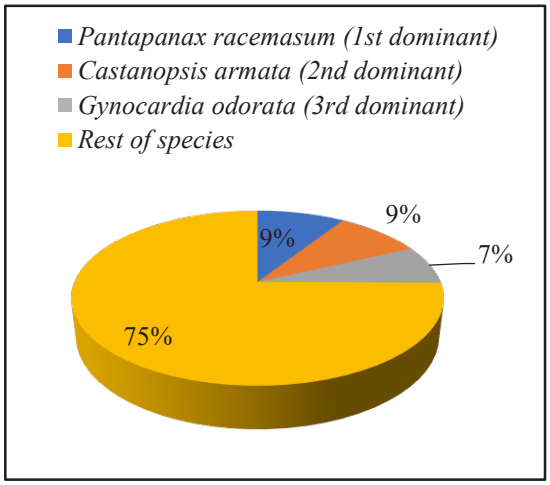


Figure 3.15.3:Girth class-wise distribution of the growing stock

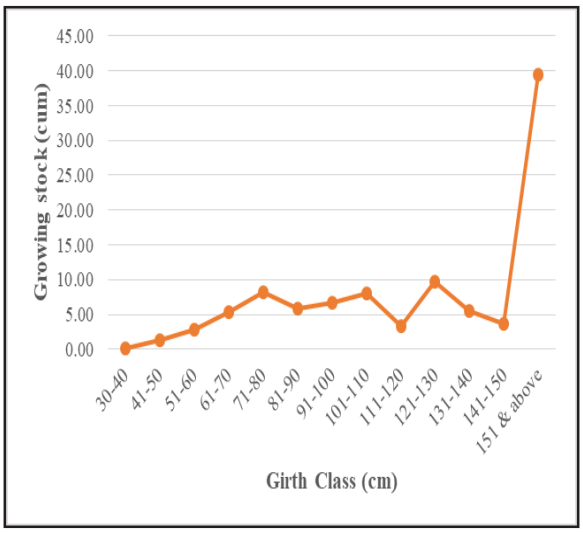


Figure 3.15.4: Overview of *Law Lyngdoh Synryn-ew Khap Mawjuta*



3.15.8 Number of Stems

Species-wise number of stems in each girth class are given in Table 3.15.8 below. As may be seen maximum numbers of stems are found in mid girth classes *i.e.* from 51-60 cm to 81-90 cm. In 151cm and above girth class a significant number of trees are present. The same indicates maturity of this forest.

Table 3.15.8: Species-wise distribution of stems in different girth classes

(numbers of stems)

Girth Class (cm)	*Pentapanax racemosus* (1st dominant)	*Castanopsis armata* (2nd dominant)	*Gynocardia odorata* (3rd dominant)	Rest of the species	Total
30-40	2	1	1	3	**7**
41-50	4	2	1	13	**20**
51-60	4	5	1	18	**28**
61-70	12	0	3	19	**34**
71-80	7	4	3	24	**38**
81-90	5	3	0	13	**21**
91-100	3	2	4	9	**18**
101-110	1	3	3	11	**18**
111-120	0	2	0	4	**6**
121-130	0	1	1	13	**15**
131-140	1	1	0	5	**7**
141-150	0	0	0	4	**4**
151 & above	1	2	1	12	**16**
Total	**40**	**26**	**18**	**148**	**232**

Figure 3.15.6: Number of stems in different girth classes

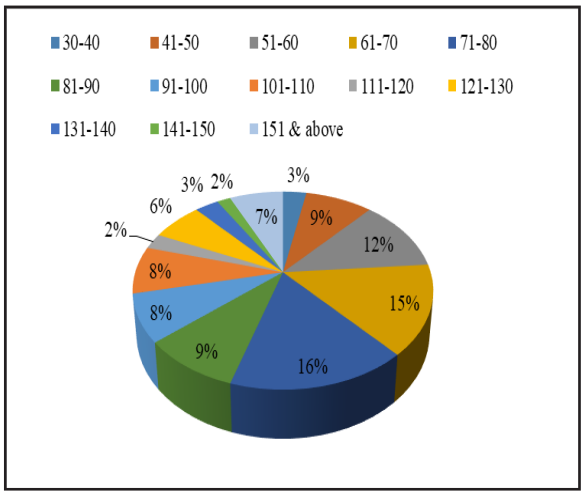


Figure 3.15.7: Species-wise distribution of stems

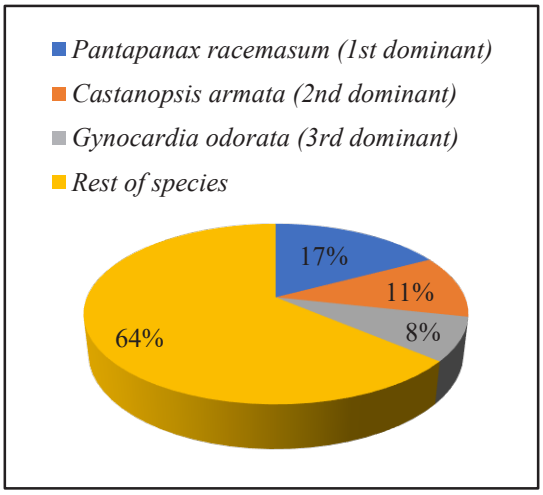


Figure 3.15.8: Number of stems in different girth classes

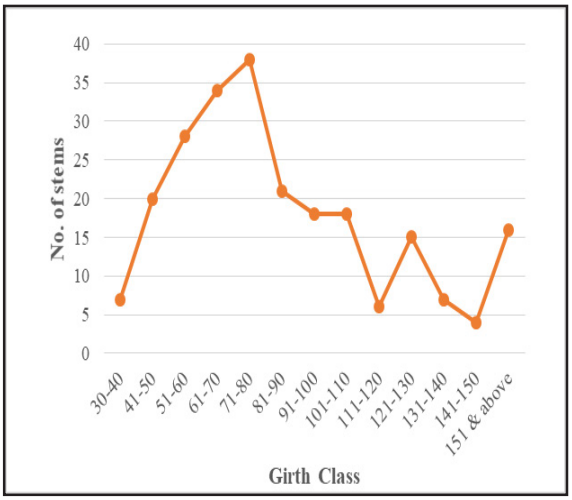


Figure 3.15.9: Inside view of *Law Lyngdoh Synryn-ew Khap Mawjuta*



3.15.9 Prescriptions for Future Management

3.15.9.1 Registration with the Khasi Hills Autonomous District Council

The United Khasi-Jaintia Hills Autonomous District (Management and Control of Forests) Rules, 1960 provides for registration of each *Law Lyngdoh* located in areas falling under jurisdiction of the Khasi Hills Autonomous District Council (KHADC). Though these rules came into force about 65 years ago, the *Law Lyngdoh Synryn-ew Khap Mawjuta* has not been registered with the KHADC. The Chief Forest Officer of the KHADC and the Village *Dorbar* of *Mawkhap* may take immediate necessary actions, as provided in Chapter-I of the said rules to register the *Law Lyngdoh Synryn-ew Khap Mawjuta* with the KHADC. The same will accord legal recognition and protection from diversion for non-forestry purposes.

3.15.9.2 Notification as Community Reserve

Section 38C of the Wild Life (Protection) Act, 1972 provides that the State Government may, where the community or an individual has volunteered to conserve wild life and its habitat, declare any private or community land not comprised within a National Park, Wildlife Sanctuary or a Conservation Reserve, as a Community Reserve, for protecting fauna, flora and traditional or cultural conservation values and practices. Notification of an area as a Community Reserve accords it legal protection. It also makes it eligible to receive financial assistance under a Centrally Sponsored Scheme of 'Integrated Development of Wildlife Habitats'. The *Dorbar* of *Mawkhap* village and Wildlife Wing in the Forest and Environment Department, Government of Meghalaya may therefore take necessary actions for notification of the *Law Lyngdoh Synryn-ew Khap Mawjuta* as a Community Reserve.

3.15.9.3 Boundary Demarcation

Boundary of the *Law Lyngdoh Synryn-ew Khap Mawjuta* has not been physically demarcated on the ground. The *Law Lyngdoh* is bounded by *Bri Raid* land in all four sides. To prevent and to ensure early detection of encroachments, boundary of the *Law Lyngdoh Synryn-ew Khap Mawjuta* may be demarcated by erection of RCC boundary pillars and painting of rings on stem of trees standing along the boundary.

3.15.9.4 Fire Protection

As per the Meghalaya Forest Fire Information System developed by the North Eastern Space Application Centre (NESAC), during a period of 22 years from 2002 to 2024 zero fire incident has occurred in the *Law Lyngdoh Synryn-ew Khap Mawjuta*. As per the Meghalaya Forest Fire Information System a major part of the *Law Lyngdoh Synryn-ew Khap Mawjuta* has 'Low' vulnerability to forest fires. As per the said information system, the *Law Lyngdoh Synryn-ew Khap Mawjuta* is not prone to forest fires. However, to prevent damage to the *Law Lyngdoh Synryn-ew Khap Mawjuta* from accidental forest fire, measures such as creation and periodic cleaning of fire line along the periphery and at critical locations within the *Law Lyngdoh Synryn-ew Khap Mawjuta* and engagement of fire watchers during the critical months may be undertaken.

3.15.9.5 Construction of Soil Moisture Conservation and Water Harvesting Structures

No perennial stream or river flows through this forest. To improve moisture regime in this forest soil and water conservation measures such as check construction of dams and contour trench across the slope at suitable locations may be attraction. Improved water regime will facilitate natural regeneration apart from attracting the wildlife.

3.15.9.6 Creation of Eco-Tourism Facilities

To create awareness about rich biodiversity of the *Law Lyngdoh Synryn-ew Khap Mawjuta* and also to create livelihood opportunities for local residents, eco-tourism facilities such as rain shelter cum view point, footpath, walking trail, sign board, washrooms *etc.* may be constructed to attract tourists.

3.15.9.7 Restocking of Degraded Areas

Efforts must be made to restock the open degraded patches in *Law Lyngdoh Synryn-ew Khap Mawjuta* by assisting and promoting natural regeneration of native species. In areas where natural regeneration is not feasible, artificial regeneration by planting seedlings of native species should be undertaken.

3.15.9.8 Formulation of A Proposal and Registration Thereof on Carbon Registry to Earn Carbon Credits

To reward the local communities for their efforts in conservation and protection of *Law Lyngdoh Synryn-ew Khap Mawjuta* for centuries, a proposal may be formulated and registered on an appropriate carbon registry to earn carbon credits for measures to be taken by the local communities for better protection and conservation of the *Law Lyngdoh Synryn-ew Khap Mawjuta*.

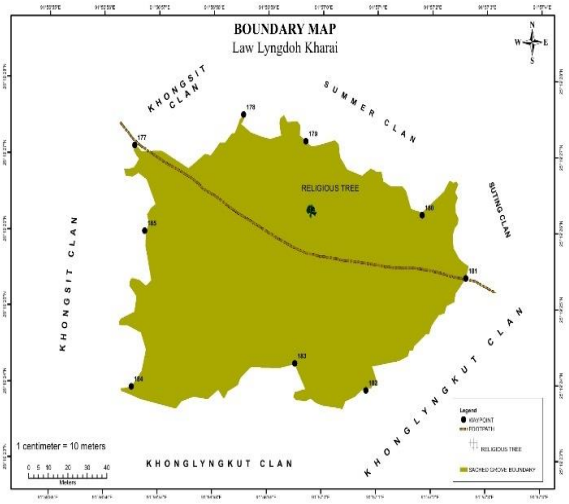
3.15.9.9 Awareness Campaign

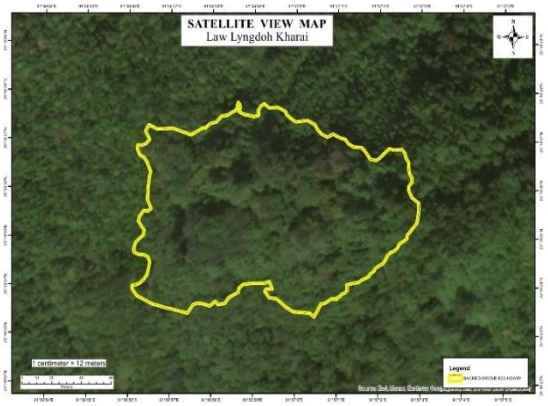
The *Lyngdoh Synryn-ew Khap Mawjuta* has been protected by the local communities for centuries for ecological, conservation and cultural beliefs. With gradual subordination of these beliefs and principles, local communities' concern for conservation and protection of sacred groves and other community owned forests is gradually declining. The same therefore needs to be revived and reinforced by creating awareness among the local communities and grassroot level institutions about cultural, heritage and economic importance of sacred groves and other community owned forests.

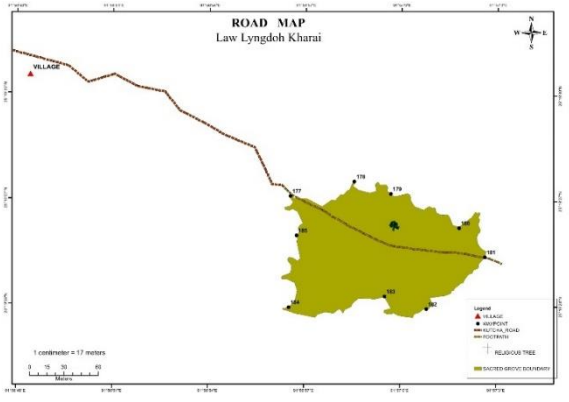
3.16. *LAW LYNGDOH KHARAI*

3.16.1 Location

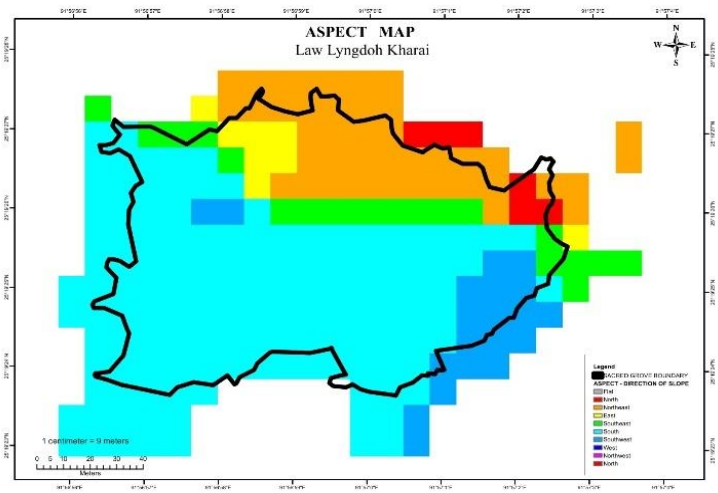
Law Lyngdoh Kharai is located in East Khasi Hills District at *Nongkhlieng* village in *Raid Nongkhlieng* under *Hima Khyrim* Syiemship. It covers an area of 1.43 ha and lies between 91° 56′ 55″ E to 91° 57′ 1″ E longitude and 25° 19′ 25″ N to 25° 19′ 26″ N latitude at an altitude of 686 m from mean sea level. The grove is bounded in the North-East and South by *Raid Nongkhlieng*, in the North-West by land of *Khongsit* Clan and *Sumer* Clan, in the east by the land of *Suting* Clan and *Khonglyngkut* Clan and in the West by the land of *Khongsit* Clan. The grove is accessible by road from Shillong. It is about 62 kms away from Shillong.







3.16.2 Brief History



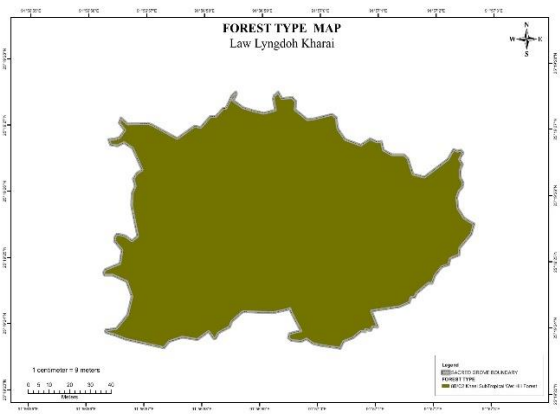
Law Lyngdoh Kharai is in existence for several centuries. In the past, religious rituals were performed every year by sacrificing animals to please the *Basa* who, as per the local belief protected the local residents from natural calamities. Currently these religious rituals are no longer performed. However, the local residents still try to preserve this relic forest for environment gains as this forest is rich in biological diversity. The *Law Lyngdoh* is managed by the local residents under the leadership and control of village headman and the *Raid Nongkhlieng*.

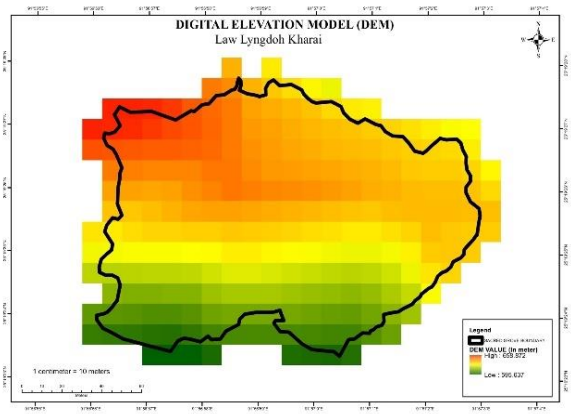
Biotic pressure such as encroachments, hunting, poaching and illegal felling of trees are absent in this forest.

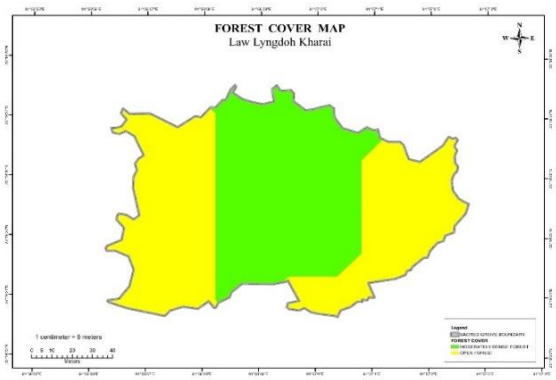
3.16.3 Geography and Climate

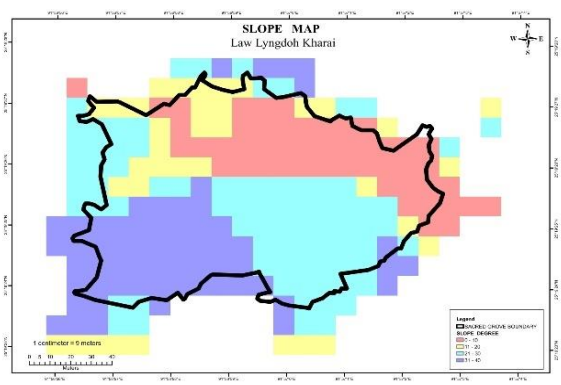
The topography of the *Law Lyngdoh* is highly undulating in nature with slope varying from 8° to 40°. Major part of the *Law Lyngdoh* falls under Southern aspect. The soil texture is loamy with no coarse fragments and soil consistency is slightly compact. The colour of the soil is brown. Soil depth is moderate. Stoniness is light. There are no signs of soil erosion.

The winter season starts from mid-November and lasts till February and summer season from May to October. Monsoon season is from May to September, the average temperature ranges from 7ºC to 32ºC.









3.16.4 Forest Type

As per the Champion and Seth classification (1968), forests found in the sacred grove are of the ***Type 8B/C2 Khasi Sub-Tropical Wet Hill Forest.***

3.16.5 Forest Cover

As per the India State of Forest Report-2021 published by the Forest Survey of India, Dehradun Forest cover in the *Law Lyngdoh Kharai i*s as below:

Forest Cover	**Area (ha.)**	**% of total Area**
Very Dense Forest (> 70%)	0	0
Moderately Dense Forest (40 %-70 %)	0.66	45.78
Open Forest (10% - 40%)	0.78	54.22
Scrub Forest (<10%)	0	0
Non-Forest	0	0
Total	**1.44**	**100**

3.16.6 Flora and Fauna

The *Law Lyngdoh Kharai* is home to moderately dense and open forest of natural origin. *Gynocardia odorata* and *Grewia abutilifolia* are respectively the 1st and 2nd dominant tree species. This forest is home to some rare, endangered and endemic plant species.

3.16.6.1 Floral species

Table 3.16.1: Trees found in *Law Lyngdoh Kharai*

Sl No.	**Local Name**	**Botanical name**	**Family name**
1.	*Dieng langer*	*Aglaia edulis*	*Meliaceae*
2.	*Dieng kreit*	*Albizia procera*	*Fabaceae*

3.	*Dieng lieng iong*	*Alnus nepalensis*	*Betulaceae*
4.	*Dieng jyrting*	*Alstonia scholaris*	*Apocinaceae*
5.	*Dieng sohsarat*	*Amplocissus latifolia*	*Vitaceae*
6.	*Dieng sohphan*	*Artocarpus heterophyllus*	*Moraceae*
7.	*Dieng sohramdieng*	*Baccaurea ramiflora ·*	*Phyllanthaceae*
8.	*Dieng jalong*	*Bauhinia variegata*	*Fabaceae*
9.	*Dieng liengiong*	*Betula alnoides*	*Betulaceae*
10.	*Dieng thynrait*	*Bochimeria glomerulifolia*	*Asteraceae*
11.	*Dieng thinroit*	*Boehmeria glomerulifera*	*Asteraceae*
12.	*Dieng lakhiat*	*Callicarpa arborea*	*Verbanaceae*
13.	*Dieng tiewlongpiur*	*Corylopsis himalayana*	*Hamamelidaceae*
14.	*Dieng tlai*	*Caryota urens*	*Aracaceae*
15.	*Dieng sansniang*	*Castanopsis armata*	*Fagaceae*
16.	*Dieng syiar*	*Castanopsis armata*	*Fagaceae*
17.	*Dieng sohsyrtap*	*Castanopsis hysteric*	*Fagaceae*
18.	*Dieng sning*	*Castanopsis tribuiloides*	*Fagaceae*
19.	*Dieng shangwiang*	*Cautleya spicata*	*Zingiberaceae*
20.	*Dieng tyrthia*	*Cinnamomum pauciflorum*	*Lauraceae*
21.	*Dieng tyngkhor*	*Cyathea spinulosa*	*Cyathaeaceae*
22.	*Dieng stein*	*Doryxylon albicum*	*Fabaceae*
23.	*Dieng brah*	*Drimycarpus racemosus*	*Anacardiaceae*
24.	*Dieng sohsyrkhah*	*Elaeocarpus floribundus*	*Eleocarpaceae*
25.	*Dieng painkhar*	*Erythroxylon kunthianum*	*Erythroxylaceae*
26.	*Dieng sohum*	*Eugenia jambolana*	*Myrtaceae*
27.	*Dieng sohpdang*	*Ficus ablongifolia*	*Moraceae*
28.	*Dieng lapong shniuh*	*Ficus oblongifolia*	*Moraceae*
29.	*Dieng jrisim*	*Ficus sarmentosa*	*Moraceae*
30.	*Dieng langkhain*	*Ficus tintora*	*Moraceae*
31.	*Dieng sohkhwang*	*Garcinia anomala*	*Clusiaceae*
32.	*Dieng sohsniang*	*Glycosmis arborea*	*Rutaceae*
33.	*Dieng blang*	*Grewia abutilifolia*	*Malvaceae*
34.	*Dieng sohliang*	*Gynocardia odorata*	*Clusiaceae*
35.	*Dieng jail*	*Ilex godajams*	*Aquifoliaceae*
36.	*Dieng langsnam*	*Knema augustifolia*	*Myristicaceae*
37.	*Dieng sarang*	*Lasianthus longicauda*	*Rubiaceae*
38.	*Dieng sying khla*	*Ligustrum robustum*	*Oleaceae*
39.	*Dieng shangwiang*	*Leea asiatica*	*Leeaceae*
40.	*Dieng shyiengkha*	*Ligustrum robustum*	*Oleaceae*
41.	*Dieng lakhar*	*Macaranga deniculate*	*Euphorbiaceae*

42.	*Dieng lakhar iong*	*Macaranga deniculate*	*Euphorbiaceae*
43.	*Dieng lakhoh*	*Mallotas alba*	*Euphorbiaceae*
44.	*Dieng phan*	*Manizot esculenta*	*Euphorbiaceae*
45.	*Dieng sohtnat syiar*	*Meliosma wallichii*	*Sabiaceae*
46.	*Dieng ngai*	*Mesuaferra indica*	*Calophyllaceae*
47.	*Dieng sohniar*	*Michelia oblonga*	*Magnoliaceae*
48.	*Dieng sohlah*	*Michelia spp*	*Magnoliaceae*
49.	*Dieng phaniaw*	*Michelia spp*	*Magnoliaceae*
50.	*Dieng sohphie*	*Myrica esculenta*	*Myricaceae*
51.	*Dieng langer*	*Myristica errantica*	*Myricaceae*
52.	*Dieng sohbrai*	*Olax nana*	*Oleaceae*
53.	*Dieng jarongsi*	*Pantapanax recemasum*	*Poaceae*
54.	*Dieng iap-iar*	*Pithecellobium heterophylum*	*Fabaceae*
55.	*Dieng thing*	*Pithocolosium glamarifolia*	
56.	*Dieng kseh um*	*Podocarpus latifolia*	*Podocarpaceae*
57.	*Dieng langkhain/ skuin(kain)*	*Rhus succedanea*	*Anacardiaceae*
58.	*Dieng ngan*	*Schima khasiana*	*Theaceae*
59.	*Dieng bhoi*	*Semecarpus anacardium*	*Anacardiaceae*
60.	*Dieng tluh*	*Sterculia vilosa*	*Aracaceae*
61.	*Dieng tangoing*	*Symplocos chinensis*	*Symplocaceae*
62.	*Dieng lawai*	*Syzygium aquacum*	*Myrtaceae*
63.	*Dieng sohlawai*	*Syzygium aquacum*	*Myrtaceae*
64.	*Dieng taro*	*Tetramoles nudiflora*	*Tetramelaceae*
65.	*Dieng sohtung/sohlung*	*Vaccinium serrentium*	*Ericaceae*
66.	*Dieng sohlang ksew*	*Viburnum carilifolium*	*Adoxaceae*
67.	*Dieng sohshiat*	*Zanthoxylum ovalifolia*	*Rutaceae*

Table 3.16.2: Shrubs found in *Law Lyngdoh Kharai*

Sl No.	Local Name	Botanical Name	Family
1.	*Dieng jalem iong*	*Clerodendrum colebrookianum*	*Verbenaceae*
2.	*Synsar*	*Thysanolaena maxima*	*Poaceae*
3.	*Kait khlaw*	*Musa acuminate*	*Musaceae*
4.	*Dieng rnong*	*Mahonia pyenaphylla*	*Berberi*
5.	*Dieng Soh lang*	*Viburnum foetidum*	*Caprifoliaceae*
6.	*Dieng Soh byrthit*	*Urena lobota*	*Malvaceae*
7.	*Dieng sohjabuit*	*Phlogacanthus thyrifora*	*Acanthaceae*

Table 3.16.3: List of Herbs found in *Law Lyngdoh Kharai*

Sl No.	Local Name	Botanical Name	Family
1.	*Slamet*	*Phrynium spp*	*Pubinevve*
2.	*Jajew khlaw*	*Begonia roxburghii*	*Begoniaceae*
3.	*Kynbat iong*	*Ageratina spp*	*Aderophora*
4.	*Soh byrthit*	*Urena lobata*	*Malvaceae*
5.	*Sying khlaw*	*Zingiber purpureum*	*Zingiberaceae*

Table 3.16.4: Climbers found in *Law Lyngdoh Kharai*

Sl No.	Local Name	Botanical Name	Family
1.	*Jyrmi pew shrieh*	*Hedera nepalensis*	*Araliaceaea*
2.	*Jyrmi sla kyndakynsew*	*Pothos scandens*	*Araceae*
3.	*Jyrmi lapla*	*Rhaphidophara decursiva*	*Araceae*
4.	*Jyrmi kophi khlaw*	*Coffea jenkinsii*	*Ribiaceae*

Table 3.16.5: Bamboos found in *Law Lyngdoh Kharai*

Sl No.	Local Name	Botanical Name	Family
1.	*Siej skong*	*Bambusa khasiana*	*Poaceae*
2.	*Siej sken*	*Bambusa pallida*	*Poaceae*

Table 3.16.6: Grasses found in *Law Lyngdoh Kharai*

Sl No.	Local Name	Botanical Name	Family
1.	*Phlang thyrnia*	*Arendenella pumila*	*Poaceae*
2.	*Phlang tylli*	*Arendenella khasiana*	*Poaceae*
3.	*Phlang jem*	*Hedyotis uncinalla*	*Rubeaceae*
4.	*Phlang ot*	*Juncus effusus*	*Juncaceae*

3.16.6.2 Faunal Species

No scientific study to assess presence and abundance of wildlife in *Law Lyngdoh Kharai* has been carried out so far. However, as per the local residents, presence of some wild animals such are jungle fowls, pangolin, jackals and numerous vertebrates and invertebrates has been reported in this forest.

3.16.7 Growing Stock

As per the methodology described in Chapter-II, enumeration was carried out in 100% area of the forest as its area is less than 2 ha. All the trees having girth (over bark) at breast height more than 30 cm were enumerated by measuring their top height (in meters) and the girth at breast height (in centimetres). Data collected during the enumeration were entered in Sacred Groves Description Form and Plot Enumeration Form. During the enumeration total 457 trees were found. These include 53 *Gynocardia odorata* (1st dominant), 52 *Grewia abutilifolia* (2nddominant), 28 *Knema augustifolia* (3rddominant) and 324 trees of rest of the species. Using the Local Volume Equations given in Chapter –II, girth classes wise volume was calculated for each tree species for each of the 13 girth classes starting from 30-40 cm to 151 cm and above. Details of the same are given in the Table: 3.16.7 below. As may be seen, total growing stock in this forest is 485.87 cubic metres.

Table 3.16.7: Species wise distribution of growing stock in different girth classes

(cum)

Girth Class (cm)	*Gynocardia odorata* (1st dominant)	*Grewia abutilifolia* (2nd dominant)	*Knema augustifolia* (3rd dominant)	rest of species	Total	% of total growing stock
30-40	0.36	0.19	0.18	2.19	**2.92**	**0.60**
41-50	1.17	1.22	0.30	4.53	**7.22**	**1.49**
51-60	1.25	0.58	1.50	5.60	**8.93**	**1.84**
61-70	1.22	2.58	0.77	11.06	**15.63**	**3.22**
71-80	2.03	2.56	0.94	15.87	**21.40**	**4.40**
81-90	1.40	3.47	3.48	20.33	**28.68**	**5.90**
91-100	1.83	8.04	2.71	23.37	**35.95**	**7.40**
101-110	3.33	1.02	0.00	10.12	**14.47**	**2.98**
111-120	9.10	8.44	1.27	24.42	**43.23**	**8.90**
121-130	6.62	1.53	0.00	16.22	**24.37**	**5.02**
131-140	1.95	1.86	1.89	14.71	**20.41**	**4.20**
141-150	6.89	6.77	4.26	27.01	**44.93**	**9.25**
151 & above	14.50	0.00	0.00	203.23	**217.73**	**44.81**
Total	**51.65**	**38.26**	**17.30**	**378.66**	**485.87**	**100.00**
% of total growing stock	10.63	7.87	3.56	77.93	100.00	

As may be seen, 10.63 % of the total growing stock is contributed by the 1st dominant species (*Gynocardia odorata).* The 2nd dominant species (*Grewia abutilifolia*) is 7.87 % of the total growing stock. Similarly, the 3rd dominant species *(Knema augustifolia)* constitutes 3.56% of the total growing stock. A major part of the growing stock i.e 77.93% is constituted by the rest of the species.

Figure 3.16.1:Girth class-wise distribution of growing stock

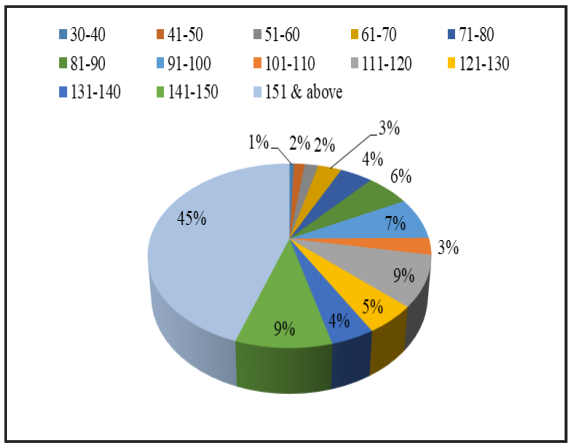


Figure 3.16.2: Species-wise distribution of growing stock

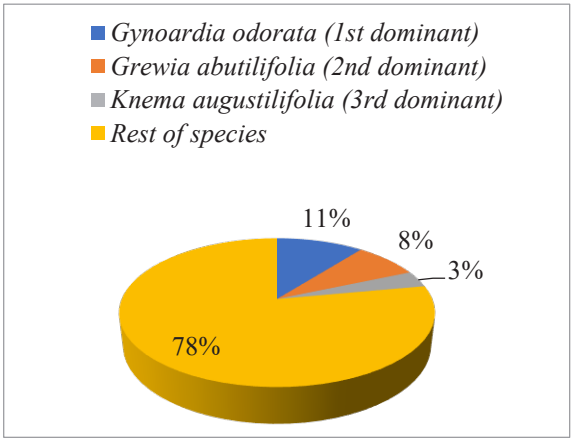


Figure 3.16.3:Girth class-wise distribution of growing stock

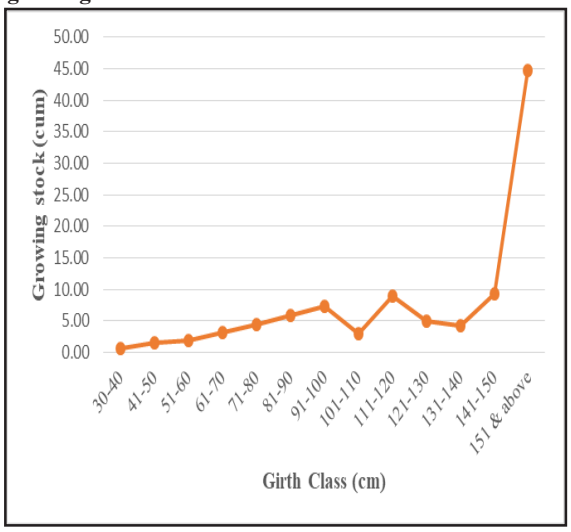


Figure 3.16.4 Overview of *Law Lyngdoh Kharai*



3.16.8 Number of Stems

Species-wise number of stems in each girth class are given in Table 3.16.8 below. As may be seen, almost equal number of trres are available in almost all girth classes, which indicates maturity of the forest. Abundance of trees in 151 cm and above girth class indicates presence of many 'Heritage trees' in this forest.

Table 3.16.8: Species-wise distribution of stems in different girth classes

(numbers of stems)

Girth Class (cm)	*Gynoardia odorata* (1st dominant)	*Grewia abutilifolia* (2nd dominant)	*Knema augustifolia* (3rd dominant)	Rest of species	Total
30-40	8	4	4	52	**68**
41-50	8	8	2	30	**48**
51-60	5	2	6	23	**36**
61-70	3	7	2	29	**41**
71-80	4	5	2	30	**41**
81-90	2	5	5	29	**41**
91-100	2	9	3	26	**40**
101-110	3	1	0	9	**13**
111-120	7	6	1	16	**30**
121-130	4	1	0	10	**15**
131-140	1	1	1	8	**11**
141-150	3	3	2	12	**20**
151 & above	3	0	0	50	**53**
Total	**53**	**52**	**28**	**324**	**457**

Figure 3.16.5: Number of stems in different girth classes

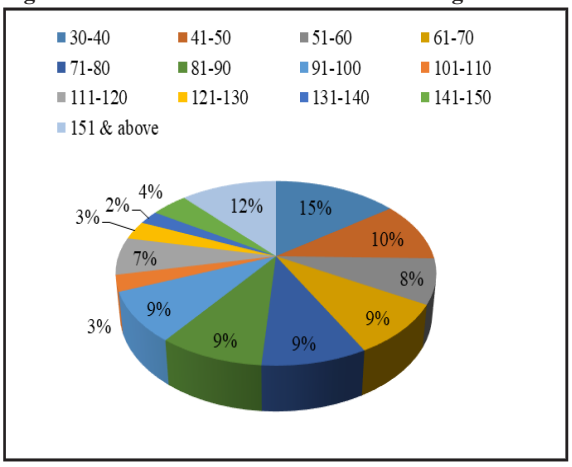


Figure 3.16.6: Species-wise distribution of stems

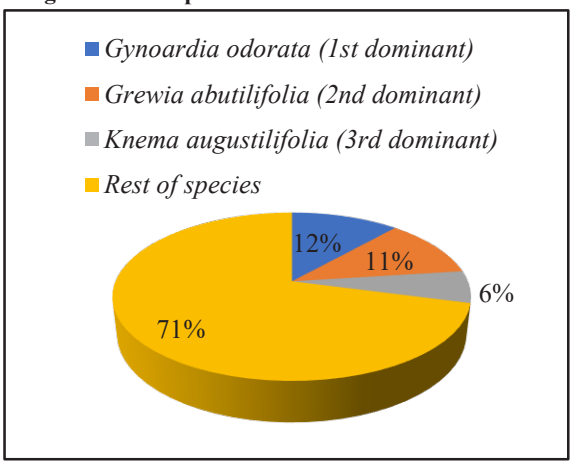


Figure 3.16.7:Number of stems in different girth classes

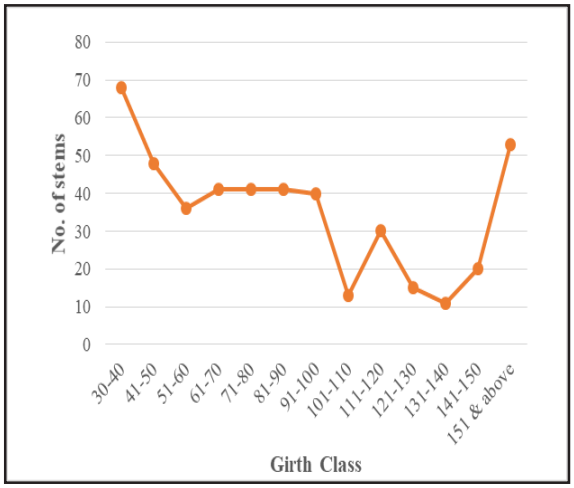


Figure 3.16.8: In side view of *Law Lyngdoh Kharai*



3.16.9 Prescriptions for Future Management

3.16.9.1 Registration with the Khasi Hills Autonomous District Council

The United Khasi-Jaintia Hills Autonomous District (Management and Control of Forests) Rules, 1960 provides for registration of each *Law Lyngdoh* located in areas falling under jurisdiction of the Khasi Hills Autonomous District Council (KHADC). Though these rules came into force about 65 years ago, the *Law Lyngdoh Kharai* has not been registered with the KHADC. The Chief Forest Officer of the KHADC and the village *Dorbar* of *Nongkhlieng* village may take immediate necessary actions, as provided in Chapter-I of the said rules to register the *Law Lyngdoh Kharai* with the KHADC. The same will accord legal recognition and protection from diversion for non-forestry purposes.

3.16.9.2 Notification as Community Reserve

Section 38C of the Wild Life (Protection) Act, 1972 provides that the State Government may, where the community or an individual has volunteered to conserve wild life and its habitat, declare any private or community land not comprised within a National Park, Wildlife Sanctuary or a Conservation Reserve, as a Community Reserve, for protecting fauna, flora and traditional or cultural conservation values and practices. Notification of an area as a Community Reserve accords it legal protection. It will also make it eligible to receive financial assistance under a Centrally Sponsored Scheme of 'Integrated Development of Wildlife Habitats'. The *Dorbar* of *Nongkhlieng Village* and Wildlife Wing in the Forest and Environment Department, Government of Meghalaya may therefore take necessary actions for notification of the *Law Lyngdoh Kharai* as a Community Reserve.

3.16.9.3 Boundary Demarcation

Boundary of the *Law Lyngdoh Kharai* has not been physically demarcated on the ground. Since this *Law Lyngdoh* is bounded by private lands on all sides, to avoid and to ensure early detection

of encroachments, boundary of the *Law Lyngdoh Kharai* may be demarcated on the ground by erection of RCC boundary pillars and painting of rings on stem of trees standing on the boundary.

3.16.9.4 Fire Protection

As per the Meghalaya Forest Fire Information System developed by the North Eastern Space Application Centre (NESAC), during a period of 22 years (2002 -2024) zero fire incident has occurred in the *Law Lyngdoh Kharai*. As per the Meghalaya Forest Fire Information System a major part of the *Law Lyngdoh Kharai* is moderately vulnerable to forest fire. Similarly, as per the said information system, a major part of the *Law Lyngdoh Kharai* is not prone to forest fire. To prevent damage to the *Law Lyngdoh Kharai f*rom accidental forest fire, measures such as creation and periodic cleaning of fire line along the periphery and at critical locations within the *Law Lyngdoh Kharai* and engagement of fire watchers during the critical months may be taken.

3.16.9.5 Construction of Soil Moisture Conservation and Water Harvesting Structures

No perennial stream or river flows through this forest. Soil and water conservation measures such as check dams and contour trench across the slope at suitable locations may be undertaken to improve moisture regime in this forest. The improved moisture regime will promote natural regeneration of native species and will also attract wildlife.

3.16.9.6 Creation of Eco-Tourism Facilities

To create awareness about rich biodiversity of the *Law Lyngdoh Kharai* and also to create livelihood opportunities for local residents, eco-tourism facilities such as rain shelter cum view point, footpath, walking trail, sign board, washrooms *etc.* may be built to attract visitors.

3.16.9.7 Restocking of Degraded Areas

Efforts may be made to restock the open degraded patches in *Law Lyngdoh Kharai* by assisting and promoting natural regeneration of native species. Areas which cannot be naturally regenerated may be afforested by planting seedlings of native species.

3.16.9.8 Formulation of A Proposal and Registration Thereof on Carbon Registry to Earn Carbon Credits

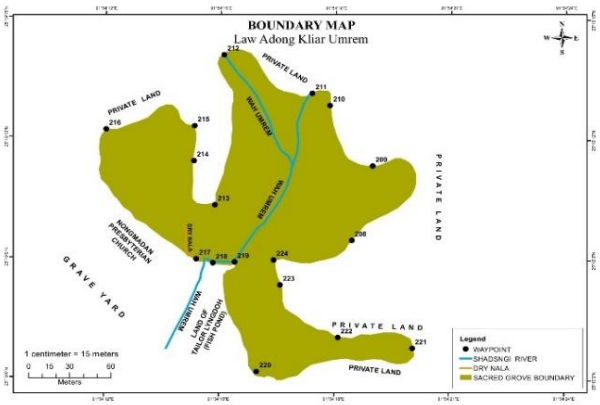
To reward the local communities for their efforts in conservation and protection of *Law Lyngdoh Kharai* for centuries, a proposal may be formulated and registered on an appropriate carbon registry to earn carbon credits for measures to be taken by the local communities for better protection and conservation of the *Law Lyngdoh Kharai*.

3.16.9.9 Awareness Campaign

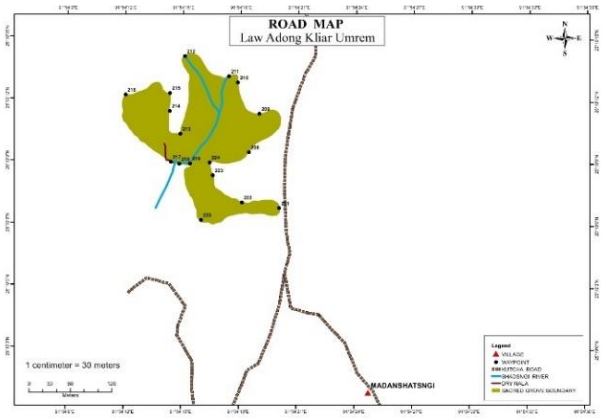
The *Law Lyngdoh Kharai* has been protected by the local communities for centuries for spiritual, conservation and cultural beliefs. With gradual subordination of these principles, local communities' concern for conservation and protection of sacred groves and other community owned forests is gradually declining. The same therefore needs to be revived and reinforced by creating awareness among the local communities and grassroot level institutions about cultural, heritage and economic importance of sacred groves and other community owned forests.

3.17. *LAW ADONG KLIAR UMREM*

3.17.1 Location

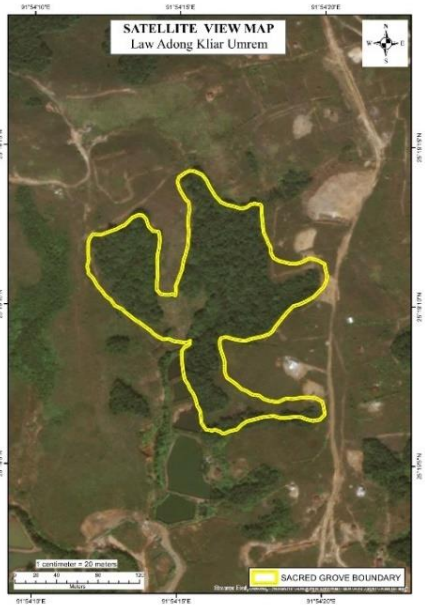


Law Adong Kliar Umrem is located in East Khasi Hills District in *Madan Shatsngi* village in *Raid Nongkhlieng* under *Hima Khyrim* Syiemship. It covers an area of 2.59 ha and lies between 91° 54′ 12″ E to 91° 54′ 20″ E longitude and 25° 19′ 5″ N to 25° 19′ 12″ N latitude at an altitude of about 1,400 m from mean sea level. The grove is bounded in the North, East and South by private land and in the West by private land and *Nongmadan* Presbyterian Church. The grove is accessible by road from Shillong by an all weather motorable road. It is located at a distance of about 52 km from Shillong.



3.17.2 Brief History

Law Adong Kliar Umrem has been in existence for several centuries. Offerings and prayers by local communities in this forest have ceased long ago as majority of local residents have embraced Christianity. This *Law Adong* is managed by the village community under the leadership of the Headman and the *Raid Nongkhlieng*. The villagers still preserve this revered forest for environmental benefits as it is rich in biological diversity.



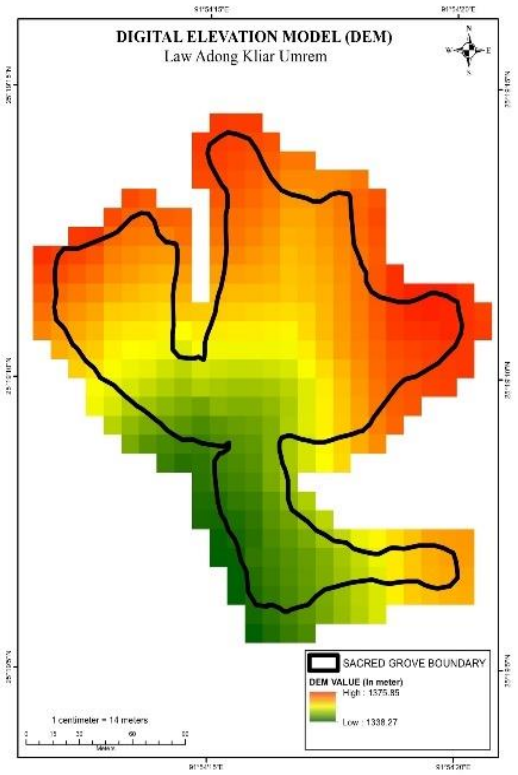
Biotic pressure such as encroachments, hunting, poaching and illegal felling of trees are found to be absent in this forest.

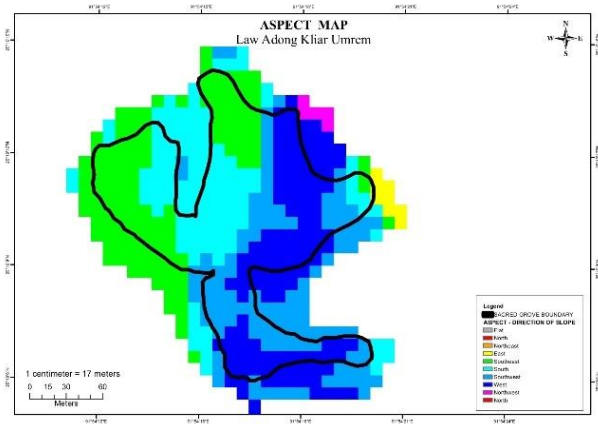
3.17.3 Geography and Climate

The topography of the Law Adong is hilly in nature with slope varying from 10° to 35°. Major part of this Law Adong falls under the South-west and Western aspects. A small portion falls under the West and South Aspects. The soil texture is silty with no coarse fragments. Soil

consistency is slightly compact. The soil is brown in colour and soil depth is shallow. Stoniness is moderate.

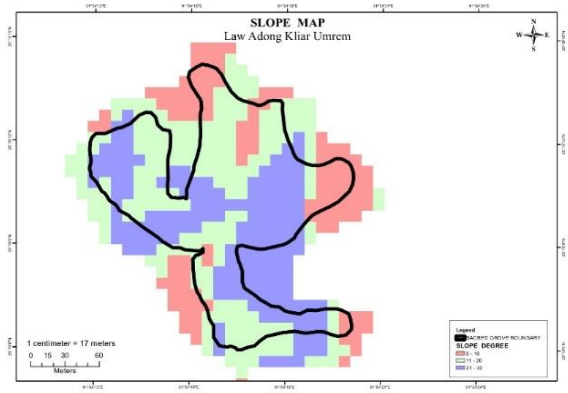
Winter season starts from mid-October and lasts till February. This forest receives very high rainfall during the monsoon season from April to September. The average temperature varies from 7ºC to 24ºC.

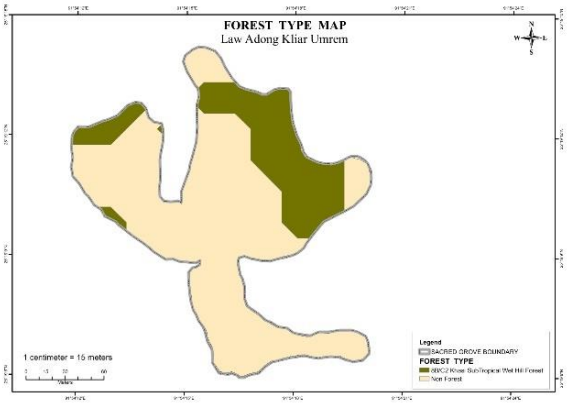




3.17.4 Forest Type

As per the Champion and Seth classification (1968), forests found in the sacred grove are of the ***Type 8B/C2 Khasi Sub-Tropical Wet Hill Forest.***





3.17.5 Forest Cover

As per the India State of Forest Report-2021 published by the Forest Survey of India, Dehradun a major part of forest cover in the *Law Adong Kliar Umrem* is classified as moderately dense forest.

3.17.6 Flora and Fauna

The *Law Adong Kliar Umrem* is home to moderately dense forest of natural origin. *Castanopsis indica* and *Itea chinensis* are respectively the 1st and 2nd dominant tree species. This forest is home to many rare, endangered and endemic plant species.

3.17.6.1 Floral species

Table 3.17.1: Trees found in *Law Adong Kliar Umrem*

Sl No.	Local Name	Botanical Name	Family
1.	*Dieng ri*	*Albizia lucidior*	*Mimosaceae*
2.	*Dieng riliang*	*Albizia spp*	*Mimosaceae*
3.	*Dieng jyrtieng*	*Alstonia scholaris*	*Apocynaceae*
4.	*Dieng latymphu*	*Aralia armata*	*Araliaceae*
5.	*Dieng lieng*	*Betula alnoides*	*Betulaceae*
6.	*Dieng sohkhara/lakaru*	*Calaphyllum polyanthum*	*Clusiaceae*
7.	*Dieng pait risang*	*Carpinus viminea*	*Betulaceae*
8.	*Dieng shlan*	*Caryota urens*	*Arecaceae*
9.	*Dieng stap*	*Castanopsis hystrix*	*Fagaceae*
10.	*Dieng sohot*	*Castanopsis indica*	*Fagaceae*
11.	*Dieng sning*	*Castanopsis tribuloides*	*Fagaceae*
12.	*Dieng jarymphiew*	*Chloranthus parviflora*	*Chloranthaceae*
13.	*Dieng sohrynsaw/ sohrang*	*Drimycarpus racemosus*	*Anacardiaceae*
14.	*Dieng sohkhyllam*	*Elaeocarpus lanceifolius*	*Elaeocarpaceae*
15.	*Dieng lba/khor*	*Engelhardtia spicata*	*Juglandaceae*
16.	*Dieng sohum*	*Eugenia jambolana*	*Myrtaceae*
17.	*Dieng doh*	*Exbucklandia populnea*	*Hamamelidaceae*
18.	*Dieng somehblang*	*Grewia abutilifolia*	*Malvaceae*
19.	*Dieng lakynphiew*	*Heteropanox fragrans*	*Araliaceae*
20.	*Dieng sohlarmaw*	*Ilex spp*	*Aquifoliaceae*
21.	*Dieng lalieh*	*Inuala cappa*	*Asteraceae*
22.	*Dieng sohsyrted*	*Itea chinensis*	*Iteaceae*
23.	*Dieng sohlang sying*	*Litsea cubeba*	*Lauraceae*
24.	*Dieng lakhar*	*Macaranga denticulate*	*Euphorbiaceae*
25.	*Dieng krot*	*Meliosma pinnata*	*Sabiaceae*
26.	*Dieng sohmiat*	*Meliosma wallichii*	*Sabiaceae*
27.	*Dieng rai-kup*	*Michelia spp*	*Magnoliaceae*
28.	*Dieng sohphie*	*Myrica esculenta*	*Myricaceae*
29.	*Dieng sohliya*	*Myrica nagi*	*Myricaceae*

30.	*Dieng lalieh*	*Prema bengalensis*	*Lamiaceae*
31.	*Dieng latyrke*	*Rauvolfia densiflora*	*Apocynaceae*
32.	*Dieng sohma*	*Rhus chinensis*	*Anacardiaceae*
33.	*Dieng ngan*	*Schima khasiana*	*Theaceae*
34.	*Dieng sohlang shyieng*	*Vibyrnum foetidum*	*Adoxaceae*
35.	*Dieng jyrngam*	*Wendlandia tinctoria*	*Rubiaceae*

Table 3.17.2: Shrubs found in *Law Adong Kliar Umrem*

Sl No.	Local Name	Botanical Name	Family
1.	*Dieng tyrnem*	*Camelia caudula*	*Theaceae*
2.	*Dieng pyrshit iong*	*Diospyrolotus*	*Ebenaceae*
3.	*Dieng tluh*	*Sterculia villosa*	*Malvaceae*
4.	*Dieng shadmoit*	*Wendlndia waliichi*	*Rubeceae*
5.	*Dieng sohlaper*	*Pinanga gracilis*	*Arecaceae*

Table 3.17.3: Herbs found in *Law Adong Kliar Umrem*

Sl No.	Local Name	Botanical Name	Family
1.	*Latara*	*Divanthus chinensis*	*Caryophyllaceae*
2.	*Sying ja*	*Allium hookeri*	*Amaryllidaceae*
3.	*Jalynthem*	*Polygonum chinensis*	*Polygonaceae*
4.	*Soh krismas*	*Sarcandra glabra*	*Zingiberaceae*
5.	*Khaw iong*	*Adentum raddianum*	*Polygonaceae*
6.	*Tiew sying*	*Cynodon daclylon*	*Poaceae*
7.	*Tiew blei*	*Coleus*	*Lamiaceae*
8.	*Tiew lieh*	*Hibiscus sohdariffa*	*Malvaceae*
9.	*Khliangsyiar*	*Centella asiatica*	*Apiaceae*
10.	*Sying khlaw*	*Zingiber purpureum*	*Zingiberaceae*

Table 3.17.4: Climbers found in *Law Adong Kliar Umrem*

Sl No.	Local Name	Botanical Name	Family
1.	*Soh shangkhlaw*	*Thumbengia laurifolia*	*Acanthaceae*
2.	*Soh krot*	*Smilax zeylanica*	*Smilacaceae*
3.	*Jyrmi lieh*	*Passiflora edulis*	*Passifloraceae*
4.	*Kharu*	*Cissampelos pareira*	*Menispermaceae*

5.	*Jyrmi sohlah*	*Gynura bicoar*	*Asteraceae*
6.	*Sla kyndajyrmi*	*Pothosspp*	*Aralaceae*
7.	*Phan synreh*	*Dioscorea alata*	*Dioscoreaceae*
8.	*Phan jyrmi*	*Stephania glabra*	*Liliaceae*

Table 3.17.5: Ferns found in *Law Adong Kliar Umrem*

Sl No.	Local Name	Botanical Name	Family
1.	*Tyrkhang khlaw*	*Cyathea gigantia*	*Cyatheaceae*
2.	*Tyrkhang maw*	*Cyathea gigantean*	*Cyatheaceae*
3.	*Tyrkhang iong*	*Adiantum raddeanum*	*Pleridaceae*
4.	*Tyrkhng nar*	*Lophosoria quadripinnata*	*Dicksoniaceae,*

Table 3.17.6: Grasses found in *Law Adong Kliar Umrem*

Sl No.	Local Name	Botanical Name	Family
1.	*Phlang thyrnia*	*Arendenella pumila*	*Poaceae*
2.	*Phlang tylli*	*Arendenella khasiana*	*Poaceae*
3.	*Phlang jem*	*Hedyotis uncinalla*	*Rubeaceae*
4.	*Phlang ot*	*Juncus effuses*	*Juncaceae*

3.17.6.2 Faunal Species

No scientific study to assess presence and abundance of wildlife in *Law Adong Kliar Umrem* has been carried out so far. However, as per the local residents, presence of several wild animals such are jungle fowls, jackals, wild boar and various types of amphibians, reptiles and birds has been reported in this forest.

3.17.7 Growing Stock

As per the methodology described in Chapter-II, enumeration was carried out in 10 sample plots in the grove as area is more than 2 ha. All the trees having girth (over bark) at breast height more than 30 cm, were enumerated by measuring the top height (in meters) and the girth (in centimetres) at breast height. Data collected during the enumeration were entered in Sacred Groves Description Form and Plot Enumeration Form. During the enumeration within the grove, data were collected for 1,125 consisting of 412 *Castanopsis indica* (1st dominant), 216 *Itea chinensis* (2nd dominant), 125 *Calophyllum polyanthum* (3rd dominant), 372 trees of rest of species. Using the Local Volume Equations given in Chapter –II, girth classes wise volume was calculated for each tree species for each of the 13 girth classes starting from 30-40 cm to 151 cm and above. Details of the same are given in the Table: 3.17.7 and 3.17.8 below. As may be seen, total growing stock in this forest is 260.39 cubic metres.

Table 3.17.7: Species wise distribution of growing stock in different girth classes

(cum)

Girth Class (cm)	*Castanopsis indica* (1st dominant)	*Itea chinensis* (2nd dominant)	*Calophyllum polyanthum* (3rd dominant)	Rest of species	Growing stock in 10 sample plots	Growing stock in entire Forest
30-40	6.70	2.73	1.27	5.22	**15.92**	20.62
41-50	10.05	5.19	3.10	7.81	**26.15**	33.87
51-60	12.18	6.20	4.66	7.54	**30.57**	39.59
61-70	6.58	14.80	10.22	14.76	**46.36**	60.04
71-80	9.24	8.99	0.00	7.35	**25.58**	33.13
81-90	5.70	13.08	0.00	5.72	**24.50**	31.73
91-100	6.42	0.00	0.00	5.22	**11.64**	15.08
101-110	3.24	0.00	0.00	7.36	**10.60**	13.73
111-120	1.93	0.00	0.00	7.80	**9.73**	12.60
121-130	0.00	0.00	0.00	0.00	**0.00**	0.00
131-140	0.00	0.00	0.00	0.00	**0.00**	0.00
141-150	0.00	0.00	0.00	0.00	**0.00**	0.00
151 & above	0.00	0.00	0.00	0.00	**0.00**	0.00
Total	**62.05**	**51.00**	**19.25**	**68.78**	**201.07**	260.39

Table 3.17.8: Species wise distribution of growing stock in different girth classes in the entire forest

(cum)

Girth Class (cm)	*Castanopsis indica* (1st dominant)	*Itea chinensis* (2nd dominant)	*Calophyllum polyanthum* (3rd dominant)	Rest of species	Total	% of total growing stock
30-40	8.68	3.54	1.64	6.76	**20.62**	**7.92**
41-50	13.01	6.72	4.02	10.12	**33.87**	**13.01**
51-60	15.77	8.03	6.03	9.76	**39.59**	**15.20**
61-70	8.52	19.17	13.24	19.11	**60.04**	**23.06**
71-80	11.97	11.64	0.00	9.52	**33.13**	**12.72**
81-90	7.38	16.94	0.00	7.41	**31.73**	**12.19**
91-100	8.32	0.00	0.00	6.76	**15.08**	**5.79**
101-110	4.20	0.00	0.00	9.53	**13.73**	**5.27**
111-120	2.50	0.00	0.00	10.10	**12.60**	**4.84**
121-130	0.00	0.00	0.00	0.00	**0.00**	**0.00**

131-140	0.00	0.00	0.00	0.00	**0.00**	**0.00**
141-150	0.00	0.00	0.00	0.00	**0.00**	**0.00**
151 & above	0.00	0.00	0.00	0.00	**0.00**	**0.00**
Total	**80.35**	**66.04**	**24.93**	**89.07**	**260.39**	**100.00**
% of total growing stock	30.86	25.36	9.57	34.31	100.00	

As may be seen, 30.86 % of the total growing stock is contributed by the 1st dominant species (*Castanopsis indica).* The 2nd dominant species (*Itea chinensis*) constitutes 25.36 % of the total growing stock. Similarly, the 3rd dominant species *(Calophyllum polyanthum)* constitutes 9.57 % of the total growing stock. A significant part of the growing stock (*i.e.* 34.31 %) is constituted by the rest of the species.

Figure 3.17.1:Girth class-wise distribution of growing stock

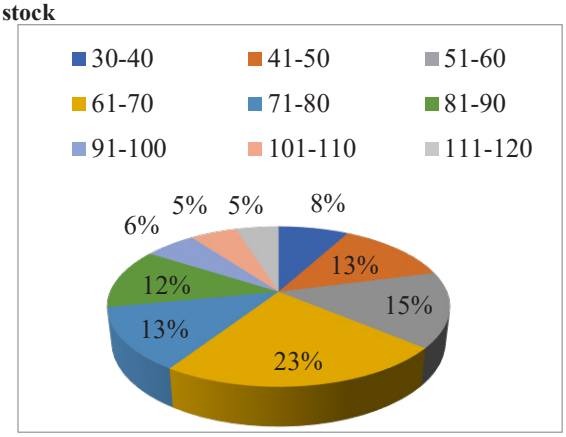


Figure 3.17.2: Species-wise distribution of growing stock

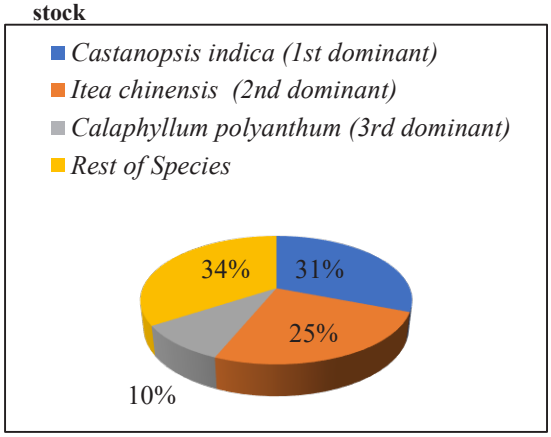


Figure 3.17.3:Girth class-wise distribution of growing stock

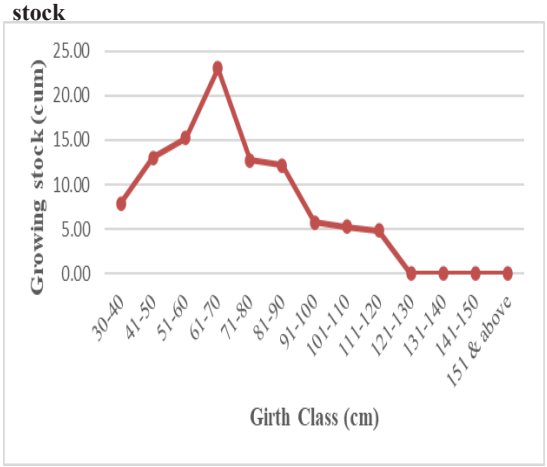


Figure 3.17.4: Overview of *Law Adong Kliar Umrem*



3.17.8 Number of Stems

Species-wise number of stems in each girth class are given in Table 3.17.9 below. As may be seen maximum numbers of stems are found in lower girth classes *i.e.* from 30-40 cm to 61-70 cm. Number of stems are inversely proportional to mid-diameter of the girth class. Absence of trees in higher girth classes indicates extraction of mature trees in the past.

Table 3.17.9: Species-wise distribution of stems in different girth classes

(numbers of stems)

Girth Class (cm)	*Castanopsis indica* (1st dominant)	*Itea chinensis* (2nd dominant)	*Calophyllum polyanthum* (3rd dominant)	Rest of the species	Total
30-40	178	70	40	160	**448**
41-50	97	49	30	77	**253**
51-60	64	32	21	38	**155**
61-70	23	22	34	48	**127**
71-80	23	20	0	17	**60**
81-90	11	23	0	10	**44**
91-100	10	0	0	7	**17**
101-110	4	0	0	8	**12**
111-120	2	0	0	7	**9**
121-130	0	0	0	0	**0**
131-140	0	0	0	0	**0**
141-150	0	0	0	0	**0**
151 & above	0	0	0	0	**0**
Total	**412**	**216**	**125**	**372**	**1125**

Figure 3.17.5: Number of stems in different girth classes

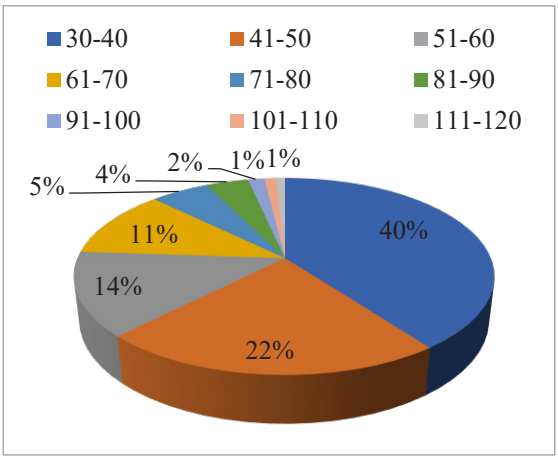


Figure 3.17.6: Species-wise distribution of stems

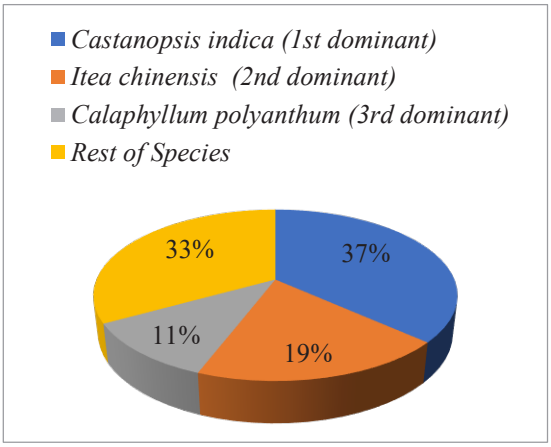


Figure 3.17.7: Number of stems in different girth classes

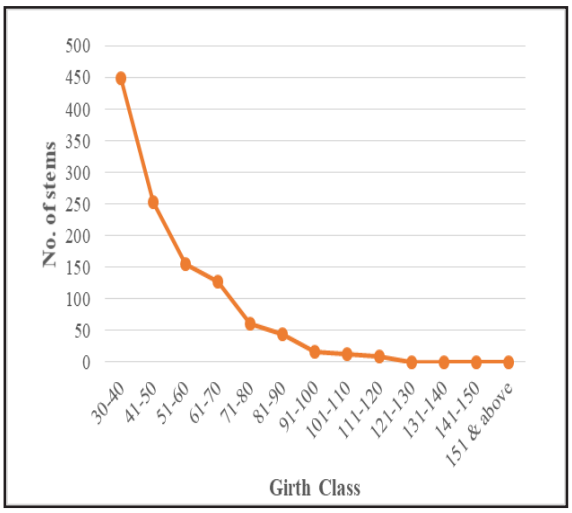


Figure 3.17.8: Inside view of *Law Adong Kliar Umrem*



3.17.9 Prescriptions for Future Management

3.17.9.1 Registration with the Khasi Hills Autonomous District Council

The United Khasi-Jaintia Hills Autonomous District (Management and Control of Forests) Rules, 1960 provides for registration of each *Law Adong* located in areas falling under jurisdiction of the Khasi Hills Autonomous District Council (KHADC). Though these rules came into force about 65 years ago, the *Law Adong Kliar Umrem* has not been registered with the KHADC. The Chief Forest Officer of the KHADC and the Village *Dorbar* of *Madan Shatsngi* village may take immediate necessary actions, as provided in Chapter-I of the said rules to register the *Law Adong Kliar Umrem* with the KHADC. The same will accord legal recognition and protection from diversion for non-forestry purposes.

3.17.9.2 Notification as Community Reserve

Section 38C of the Wild Life (Protection) Act, 1972 provides that the State Government may, where the community or an individual has volunteered to conserve wild life and its habitat, declare any private or community land not comprised within a National Park, Wildlife Sanctuary or a Conservation Reserve, as a Community Reserve, for protecting fauna, flora and traditional or cultural conservation values and practices. Notification of an area as a Community Reserve accords it legal protection. It will also make it eligible to receive financial assistance under a Centrally Sponsored Scheme of 'Integrated Development of Wildlife Habitats'. The *Dorbar* of *Madan Shatsngi* village and Wildlife Wing in the Forest and Environment Department, Government of Meghalaya may therefore take necessary actions for notification of the *Law Adong Kliar Umrem* as a Community Reserve.

3.17.9.3 Boundary Demarcation

Boundary of the *Law Adong Kliar Umrem* has not been physically demarcated on the ground. *Law Adong* is bounded by private lands. To avoid and to ensure early detection of encroachments, boundary of the *Law Adong Kliar Umrem*, wherever it is not constituted by features of permanent natural may be demarcated by erection of RCC boundary pillars and painting of rings on stem of trees standing on the boundary.

3.17.9.4 Fire Protection

As per the Meghalaya Forest Fire Information System developed by the North Eastern Space Application Centre (NESAC) during a period of 22 years from 2002 to 2024 no fire incident has occurred in the *Law Adong Kliar Umrem*. As per the said System a major part of the *Law Adong Kliar Umrem* is highly vulnerable to forest fire. However, as per the said information system, a major part of the *Law Adong Kliar Umrem* is less prone to forest fires. To prevent damage to the *Law Adong Kliar Umrem* from accidental forest fires, measures such as creation and periodic cleaning of fire line along the periphery and at critical locations within the *Law Adong Kliar Umrem* and engagement of fire watchers during the critical months may be taken.

3.17.9.5 Construction of Soil Moisture Conservation and Water Harvesting Structures

One stream flow through the Law Adong, *i.e. Wah Umrem*. To improve moisture regime in this forest, soil and water conservation measures such as costruction of check dams and contour trench across the slope at suitable locations may be undertaken. Improved moisture regime will promote regeneration of native species and will also attract wildlife.

3.17.9.6 Creation of Eco-Tourism Facilities

To create awareness about rich biodiversity of the *Law Adong Kliar Umrem* and also to create livelihood opportunities for local residents, eco-tourism facilities such as rain shelter cum view point, footpath, walking trail, sign board, washroom *etc.* may be constructed to attract tourists.

3.17.9.7 Restocking of Degraded Areas

Efforts may be made to restock the degraded patches in *Law Adong Kliar Umrem* by assisting and promoting natural regeneration of native species. Areas which cannot be renerated by natural regeneration alone may be restocked by planting seedlings of native species.

3.17.9.8 Formulation of A Proposal and Registration Thereof on Carbon Registry to Earn Carbon Credits

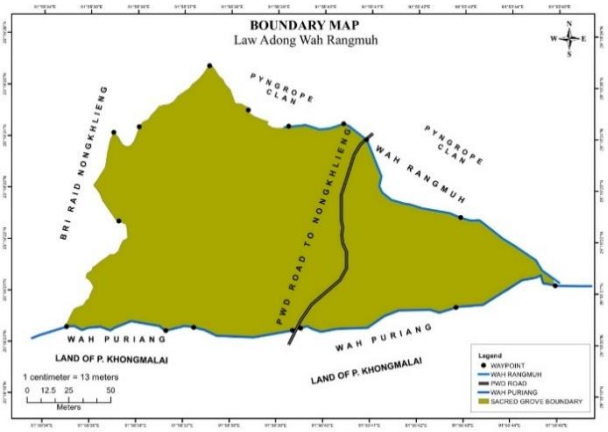
To reward the local communities for their efforts in conservation and protection of *Law Adong Kliar Umrem* for centuries, a proposal may be formulated and registered on an appropriate carbon registry to earn carbon credits for measures to be taken by the local communities for better protection and conservation of the *Law Adong Kliar Umrem*.

3.17.9.9 Awareness Campaign

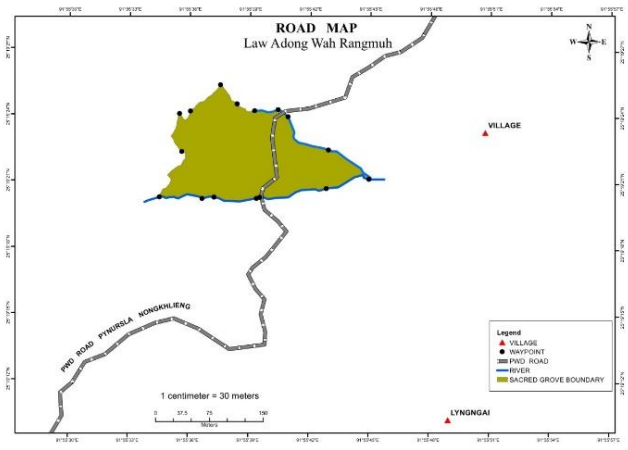
The *Law Adong Kliar Umrem* has been protected by the local communities for centuries for spiritual, conservation and cultural beliefs. With gradual subordination of these principles, local communities' concern for conservation and protection of sacred groves and other community owned forests is gradually declining. The same therefore needs to be revived and reinforced by creating awareness among the local communities and grassroot level institutions about cultural, heritage and economic importance of sacred groves and other community owned forests.

3.18. *LAW ADONG WAH RANGMUH*

3.18.1 Location



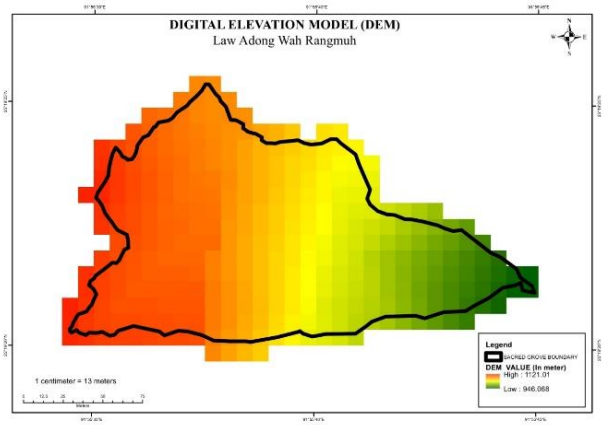
Law Adong Wah Rangmuh is located in East Khasi Hills District in *Mylliat* village in Raid *Nongkhlieng* under *Hima Khyrim* Syiemship. It covers an area of 2.58 ha and lies between 91° 55′ 35″ E to 91° 55′ 45″ E longitude and 25° 19′ 20″ N to 25° 19′ 25″ N latitude at an altitude of about 1,137 m from the mean sea level. The grove is bounded in the North-East by the land of *Pyngrope* Clan land and *Wah Rangmuh stream*, in the North West by agriculture land of Bri *Raid Nongkhlieng* and South by *Wah Puriang* stream and land of P. Khongmalai. The grove is accessible by road from by an all-weather motorable road. It is about 60 km away from Shillong.



3.18.2 Brief History

Law Adong Wah Rangmuh is in existence for several centuries. In the past, religious ceremonies were performed in this grove. However, currently no such rituals are performed in this forest as majority of local residents have embraced Christianity. The forefather of this village realized the need to protect the environment in and around the village to avoid natural calamities. This *Law Adong* is managed by the residents of the *Mylliat* village under the leadership and supervision of the *Raid*

Nongkhlieng. The local residents preserve this forest for the environmental benefits. Entry into this grove is not prohibited but felling of trees, hunting and poaching are strictly prohibited.



Biotic pressure such as encroachments, hunting, poaching and illegal felling of trees are found to be absent in this forest.

3.18.3 Geography and Climate

The topography of the *Law Adong* is highly undulating in nature with slope varying from 7° to 55°. Major part of this grove falls under the Eastern aspect. A small portion of this Law Adong falls under the southern aspect. Soil texture is loamy with no coarse fragments. Soil consistency is slightly compact. The soil is brown in colour and soil depth is shallow. Stoniness is moderate.



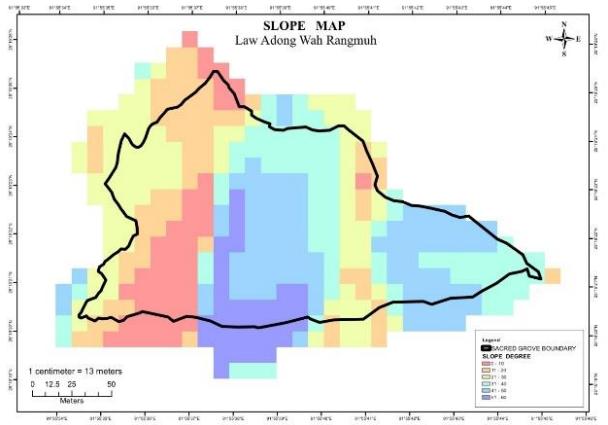
The winter season lasts from mid-November to February and summer season from May to October. This forest receives very high rainfall during the monsoon season from April to September.

3.18.4 Forest Type

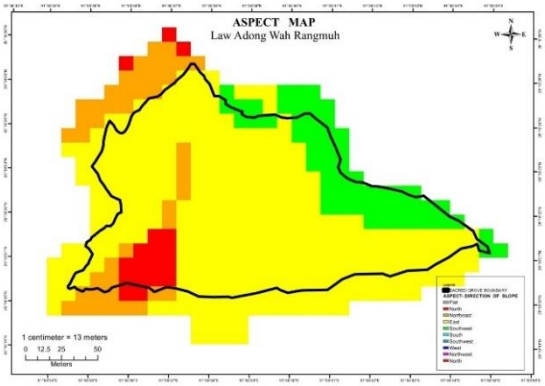
As per the Champion and Seth classification (1968), forests found in this forest are of the ***Type 8B/C2 Khasi Sub-Tropical Wet Hill Forest*** and ***Type 1/2S1 Pioneer Euphorbiaceous Scrub.***

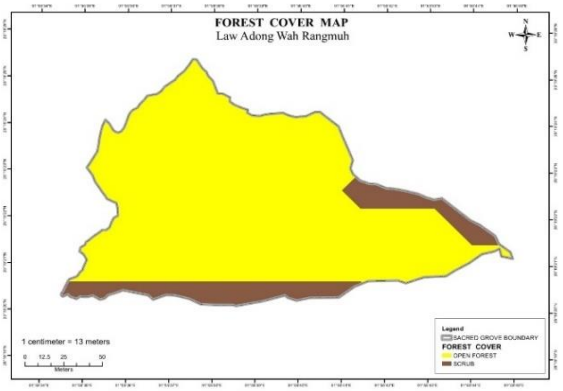
3.18.5 Forest Cover

As per the India State of Forest Report-2021 published by the Forest Survey of India, Dehradun Forest cover in the *Law Adong Wah Rangmuh i*s as below:



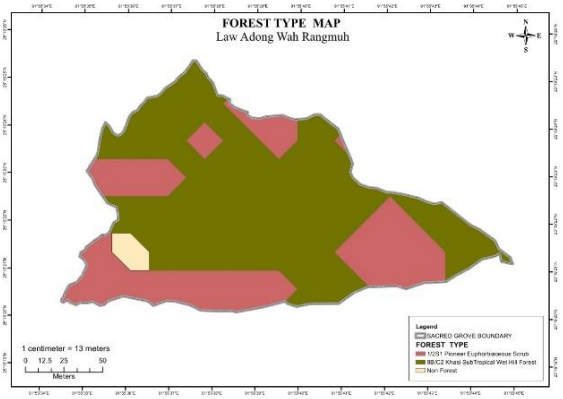
Forest Cover	Area (ha.)	% of total Area
Very Dense Forest (> 70%)	0	0
Moderately Dense Forest (40 %-70 %)	0	0
Open Forest (10% - 40%)	2.25	87.20
Scrub Forest (<10%)	0.33	12.84
Non-Forest	0	0
Total	**2.58**	**100**





3.18.6 Flora and Fauna

The *Law Adong Wah Rangmuh* is home to open degraded forest of natural origin. *Doryxylon albicum* and *Calicarpa arborea* are respectively the 1st and 2nd dominant tree species. Some rare, endangered and endemic plant species are also found in this forest.



3.18.6.1 Floral species

Table 3.18.1: Trees found in *Law Adong Wah Rangmuh*

Sl No.	Local Name	Botanical Name	Family Name
1	*Dieng phyllut*	*Albizzia stipulate*	*Mimosaceae*
2.	*Dieng lieng*	*Betula alnoides*	*Betulaceae*
3.	*Dieng lieng lieh*	*Betula alnoides*	*Betulaceae*

4.	*Dieng shyieng*	*Betula alnoides*	*Betulaceae*
5.	*Dieng lakhiat*	*Calicarpa arborea*	*Verbenaceae*
6.	*Dieng tyrkhang*	*Caryota spp*	*Arecaceae*
7.	*Dieng tlai*	*Caryota urens*	*Arecaceae*
8.	*Dieng stap*	*Castanopsis hystrix*	*Fagaceae*
9.	*Dieng sning*	*Castanopsis tribuiloides*	*Fagaceae*
10.	*Dieng tyrthia*	*Cinnamomum pauciflorum*	*Lauraceae*
11.	*Dieng pyiur*	*Corylopsis himalayana*	*Hamamelidaceae*
12.	*Dieng sohkhangmar/tyrkhang*	*Cyathea spinulosa*	*Cyatheaceae*
13.	*Dieng stein*	*Doryxylon albicum*	*Fabaceae*
14.	*Dieng lba*	*Engelhardtia spicata*	*Juglandaceae*
15.	*Dieng pyrshit*	*Eurya accuminata*	*Pentaphyllaceae*
16.	*Dieng sohpdang*	*Ficus ablongifolia*	*Moraceae*
17.	*Dieng thylliang*	*Ficus elmeri*	*Moraceae*
18.	*Dieng sohlapong*	*Ficus hispida*	*Moraceae*
19.	*Dieng sohbyrsiat*	*Ficus spp*	*Moraceae*
20.	*Dieng byrsiat*	*Ficus spp*	*Moraceae*
21.	*Dieng sohphlang*	*Flemingia vestita*	*Fabaceae*
22.	*Dieng sohsniang*	*Glycosmis arborea*	*Rutaceae*
23.	*Dieng sohmeblang*	*Grewia abutilifolia*	*Malvaceae*
24.	*Dieng sohliang*	*Gynocardia odorata*	*Achariaceae*
25.	*Dieng sohsyrtet*	*Itea chinensis*	*Saxifragaceae*
26.	*Dieng sying*	*Ligustrum robustrum*	*Oleaceae*
27.	*Dieng sying*	*Litsea cubeba*	*Lauraceae*
28.	*Dieng lakhar*	*Macaranga denticulate*	*Euphorbiaceae*
29.	*Dieng lakhar saw*	*Macaranga denticulate*	*Euphorbiaceae*
30.	*Dieng sohniar*	*Machilus parviflora*	*Lauraceae*
31.	*Dieng lakhoh/sohlakhoh*	*Mallotas alba*	*Euphorbiaceae*
32.	*Dieng satniat*	*Meliosma wallichii*	*Sabiaceae*
33.	*Dieng sohlah*	*Michelia spp*	*Magnoliaceae*
34.	*Dieng bylliat*	*Morus macrouna*	*Moraceae*
35.	*Dieng jalu*	*Piitosporum nepalense*	*Pittosporaceae*
36.	*Dieng latyngkien*	*Rauvolfia densiflora*	*Apocynaceae*
37.	*Dieng lapit/sohlympit*	*Saurauia roxburghii*	*Actinidiaceae*
38.	*Dieng ngan*	*Schima khasiana*	*Theaceae*

39.	*Dieng sohlait*	*Spondias axillaris*	*Anacardiaceae*
40.	*Dieng tluh*	*Sterculia villosa*	*Aracaceae*
41.	*Dieng bti*	*Toona ciliate*	*Meliaceae*
42.	*Dieng langta*	*Trema orientalis*	*Cannabaceae*
43.	*Dieng sohtung*	*Vaccinium serrentium*	*Ericaceae*
44.	*Dieng soh danei*	*Garcinia pedunculata*	*Clusiaceae*

Table 3.18.2: Shrubs found in *Law Adong Wah Rangmuh*

Sl No.	Local Name	Botanical Name	Family
1.	*Jathynroit*	*Cynometra ramiflora*	*Fabaceae*
2.	*Lakhain*	*Ficos tomintosa*	*Maraceae*
3.	*Tyrkhang khlaw*	*Asplinia nidus*	*Aspleniaceae*
4.	*Tyrkhang nar*	*Lophosoria quadripinnata*	*Dicksoniaceae,*
5.	*Dieng khaw iong*	*Adeantum raddianum*	*Polygonceae*
6.	*Dieng soh pyrsit*	*Eurya acuminate*	*Theaceae*
7.	*Dieng shadmoit*	*Wendlndiawaliichi*	*Rubeceae*

Table 3.18.3: Herbs found in *Law Adong Wah Rangmuh*

Sl No.	Local Name	Botanical Name	Family
1.	*Jalynthem*	*Polygonum chinensis*	*Polygonaceae*
2.	*Tiewlieh*	*Hibiscus sohdariffa*	*Malvaceae*
3.	*Tiewsying*	*Cynodon dachylon*	*Poaceae*
4.	*Soh krismas*	*Sarcandra glabra*	*Zingiberaceae*

Table 3.18.4: Climbers found in *Law Adong Wah Rangmuh*

Sl No.	Local Name	Botanical Name	Family
1.	*Jyrmi japan*	*Chromolaena odorata*	*Asteraceae*
2.	*Jyrmi sohpairew*	*Rubus elleplicus*	*Rosaceaea*
3.	*Jyrmi soh krot*	*Smilax zeylanica*	*Smilacaceae*
4.	*Jyrmi shiah, sohkrot*	*Smilax zeylanica*	*Smilacaceae*
5.	*Jyrmi lieh*	*Possiflora edulis*	*Passiflaraceae*
6.	*Jyrmi sohlah*	*Gynura bicolor*	*Asteraceae*
7.	*Jyrmi shiah nepbah*	*Ampelocissus latifolia*	*Vitaceae*
8.	*Jyrmi kharu*	*Cissompelas pariera*	*Menispermaceae*

Table 3.18.5: Bamboos found in *Law Adong Wah Rangmuh*

Sl No.	Local Name	Botanical Name	Family
1.	*Siej skong*	*Bambusa khasiana*	*Poaceae*
2.	*Siej sken*	*Bambusa pallida*	*Poaceae*
3.	*Siej iong*	*Chimonobambusa hookeriana*	*Poaceae*

Table 3.18.6: Grasses found in *Law Adong Wah Rangmuh*

Sl No.	Local Name	Botanical Name	Family
1.	*Lang phot*	*Juncus effuses*	*Poaceae*
2.	*Phlang thyrnia*	*Arendenella pumila*	*Poaceae*
3.	*Phlang tylli*	*Arendenella khasiana*	*Poaceae*
4.	*Phlang jem*	*Hedyotis uncinalla*	*Rubeaceae*
5.	*Phlang tyngsok*	*Porium masenimum*	*Poaceae*

Table 3.18.7: Ferns found in *Law Adong Wah Rangmuh*

Sl No.	Local Name	Botanical Name	Family
1.	*Tyrkhng nar*	*Lophosoria quadripinnata*	*Dicksoniaceae,*
2.	*Tyrkhang khlaw*	*Cyathea gigantia*	*Cyatheaceae*
3.	*Tyrkhang sying*	*Adiantum raddianum*	*Pleridaceae*
4.	*Tyrkhang maw*	*Cyathea gigantean*	*Cyatheaceae*

3.18.6.2 Faunal Species

No scientific study to assess presence and abundance of wildlife in *Law Adong Wah Rangmuh* has been carried out so far. However, as per the local residents, presence of various types of amphibians, reptiles and birds has been reported in this forest.

3.18.7 Growing Stock

As per the methodology described in Chapter-II, enumeration was carried out in 10 sample plots in the grove as area of this forest is more than 2 ha. All the trees, having girth (over bark) at breast height more than 30 cm, were enumerated by measuring the top height (in meters) and the girth (in centimetres) at breast height. Data collected during the enumeration was entered in Sacred Groves Description Form and Plot Enumeration Form. Enumeration data were collected for 590 trees species consisting of 167 *Doryxylon albicum* (1st dominant), 123 *Calicarpa arborea* (2nd dominant), 28 *Caryota urens* (3rd dominant), 272 trees of the rest of species. Using the Local Volume Equations given in Chapter –II, girth classes wise volume was calculated for each tree species for each of the 13 girth classes starting from 30-40 cm to 151 cm and above. Details of the same are given in the Table: 3.18.8 and 3.18.9 below. As may be seen, total growing stock in this forest is 227.47 cubic metres.

Table 3.18.8: Species wise distribution of growing stock in different girth classes

(cum)

Girth Class (cm)	*Doryxylon albicum* (1st dominant)	*Calicarpa arborea* (2nd dominant)	*Caryota urens* (3rd dominant)	Rest of Species	Growing stock in 10 sample plots	Growing stock in entire Forest
30-40	3.37	2.02	0.08	3.07	**8.54**	11.02
41-50	1.75	2.48	0.16	5.46	**9.84**	12.70
51-60	2.57	2.25	0.62	5.26	**10.70**	13.80
61-70	3.64	1.93	0.74	5.52	**11.83**	15.26
71-80	3.23	1.88	0.37	7.92	**13.40**	17.29
81-90	4.38	1.81	0.98	9.51	**16.69**	21.53
91-100	10.88	3.02	0.63	4.62	**19.15**	24.70
101-110	0.00	0.00	0.00	4.13	**4.13**	5.33
111-120	0.00	0.00	0.97	6.64	**7.61**	9.82
121-130	0.00	0.00	0.00	12.07	**12.07**	15.57
131-140	0.00	0.00	0.00	0.00	**0.00**	0.00
141-150	0.00	0.00	0.00	12.74	**12.74**	16.43
151 & above	0.00	0.00	14.91	34.72	**49.63**	64.02
Total	**29.82**	**15.40**	**19.46**	**111.66**	**176.33**	227.47

Table 3.18.9: Species wise distribution of growing stock in different girth classes in the entire forest

(cum)

Girth Class (cm)	*Doryxylon albicum* (1st dominant)	*Calicarpa arborea* (2nd dominant)	*Caryota urens* (3rd dominant)	Rest of Species	Total	% of total growing stock
30-40	4.35	2.61	0.1	3.96	**11.02**	**4.84**
41-50	2.26	3.20	0.20	7.04	**12.70**	**5.58**
51-60	3.32	2.90	0.80	6.78	**13.80**	**6.07**
61-70	4.69	2.49	0.96	7.12	**15.26**	**6.71**
71-80	4.17	2.42	0.48	10.22	**17.29**	**7.60**
81-90	5.65	2.34	1.27	12.27	**21.53**	**9.46**
91-100	14.03	3.90	0.81	5.96	**24.70**	**10.86**
101-110	0.00	0.00	0.00	5.33	**5.33**	**2.34**
111-120	0.00	0.00	1.25	8.57	**9.82**	**4.32**
121-130	0.00	0.00	0.00	15.57	**15.57**	**6.84**
131-140	0.00	0.00	0.00	0.00	**0.00**	**0.00**

141-150	0.00	0.00	0.00	16.43	**16.43**	**7.22**
151 & above	0.00	0.00	19.23	44.79	**64.02**	**28.14**
Total	**38.47**	**19.86**	**25.10**	**144.04**	**227.47**	**100.00**
% of total growing stock	16.91	8.73	11.03	63.32	100.00	

As may be seen, 16.91 % of the total growing stock is contributed by the 1st dominant species (*Doryxylon albicum).* The 2nd dominant species (*Calicarpa arborea*) constitutes 8.73 % of the total growing stock. Similarly, the 3rd dominant species *(Caryota urens)* constitutes 11.03 % of the total growing stock. A major part of the growing stock (*i.e.* 63.32 %) is constituted by the rest of the species.

Figure 3.18.1: Girth class-wise distribution of the growing stock

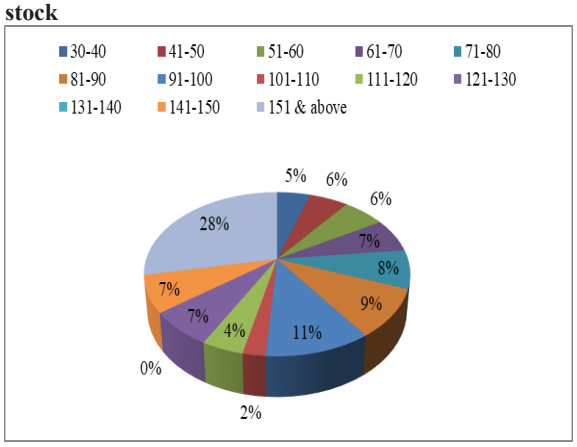


Figure 3.18.2: Species-wise distribution of growing stock

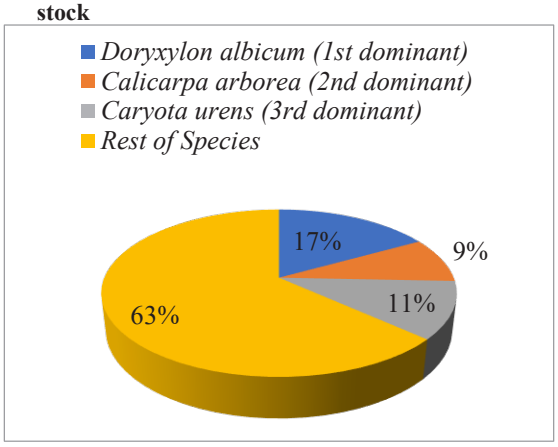


Figure 3.18.3:Girth class-wise distribution of growing stock

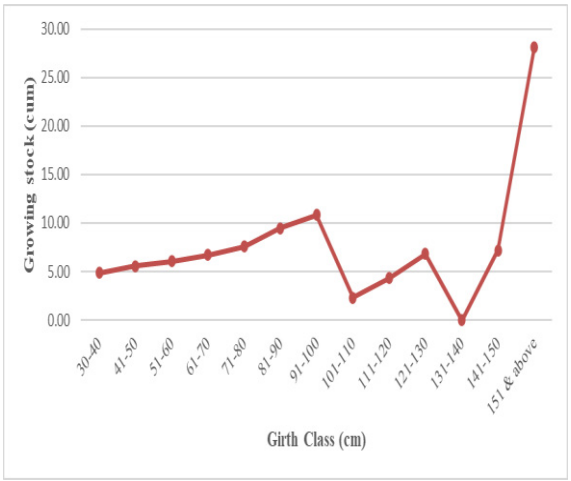


Figure 3.18.4: Overview of *Law Adong Wah Rangmuh*



3.18.8 Number of Stems

Species-wise number of stems in each girth class are given in Table 3.18.10 below. As may be seen maximum numbers of stems are found in lower girth classes *i.e.* from 30-40 cm to 51-60 cm. Number of stems are inversely proportional to mid-diameter of the girth class. Large of number trees in 30-40 cm girth class is explained by forest type *1/2S1 Pioneer Euphorbiaceous Scrub.*

Table 3.18.10: Species-wise distribution of stems in different girth classes

(numbers of stems)

Girth Class (cm)	*Doryxylon albicum* (1st dominant)	*Calicarpa arborea* (2nd dominant)	*Caryota urens* (3rd dominant)	Rest of the species	Total
30-40	86	42	6	98	**232**
41-50	18	30	2	48	**98**
51-60	15	18	4	27	**64**
61-70	14	11	3	17	**45**
71-80	9	8	1	19	**37**
81-90	9	6	2	16	**33**
91-100	16	8	1	7	**32**
101-110	0	0	0	5	**5**
111-120	0	0	1	6	**7**
121-130	0	0	0	9	**9**
131-140	0	0	0	0	**0**
141-150	0	0	0	7	**7**
151 & above	0	0	8	13	**21**
Total	**167**	**123**	**28**	**272**	**590**

Figure 3.18.5:Number of stems in different girth classes

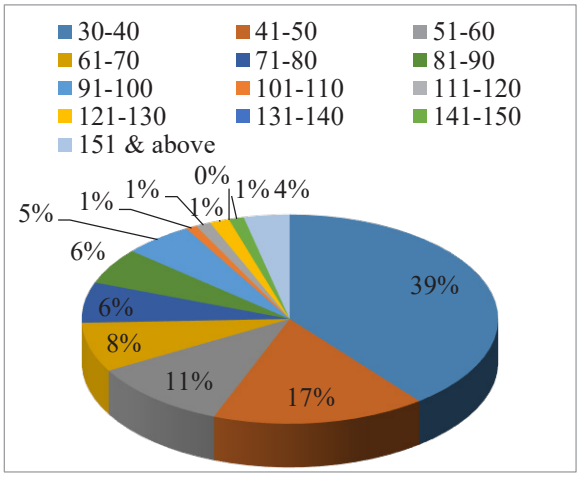


Figure 3.18.6: Species-wise distribution of stems

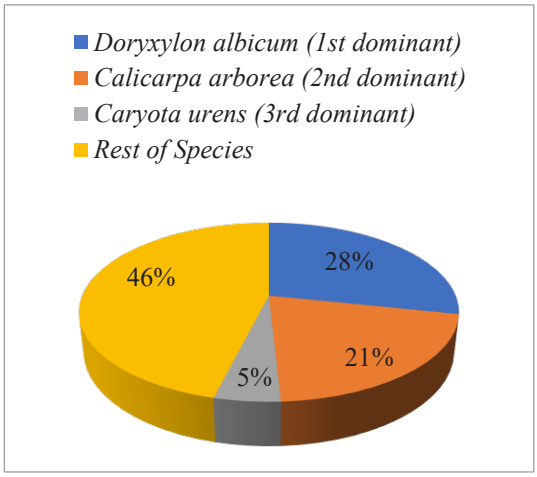


Figure 3.18.7: Number of stems in different girth classes

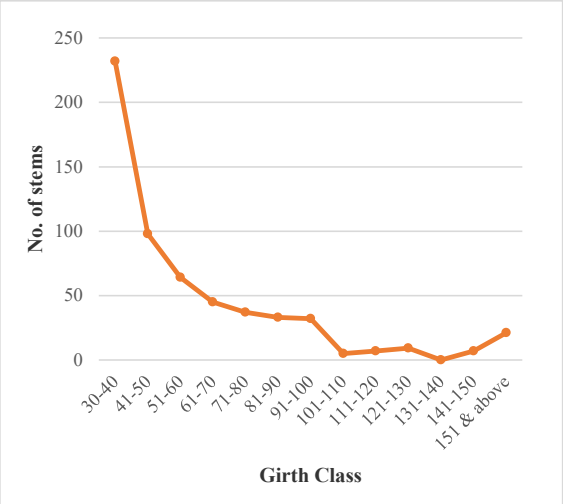


Figure 3.18.8: Inside view of *Law Adong Wah Rangmuh*



3.18.9 Prescriptions for Future Management

3.18.9.1 Registration with the Khasi Hills Autonomous District Council

The United Khasi-Jaintia Hills Autonomous District (Management and Control of Forests) Rules, 1960 provides for registration of each *Law Adong*/*Law Kyntang* located in areas falling under jurisdiction of the Khasi Hills Autonomous District Council (KHADC). Though these rules came into force about 65 years ago, the *Law Adong Wah Rangmuh* has not been registered with the KHADC. The Chief Forest Officer of the KHADC and the Village *Dorbar* of *Mylliat* may take immediate necessary actions, as provided in Chapter-I of the said rules to register the *Law Adong Wah Rangmuh* with the KHADC. The same will accord legal recognition and protection from diversion for non-forestry purposes.

3.18.9.2 Notification as Community Reserve

Section 38C of the Wild Life (Protection) Act, 1972 provides that the State Government may, where the community or an individual has volunteered to conserve wild life and its habitat, declare any private or community land not comprised within a National Park, Wildlife Sanctuary or a Conservation Reserve, as a Community Reserve, for protecting fauna, flora and traditional or cultural conservation values and practices. Notification of an area as a Community Reserve accords it legal protection. It also makes it eligible to receive financial assistance under a Centrally Sponsored Scheme of 'Integrated Development of Wildlife Habitats'. The *Dorbar* of *Mylliat* Village and Wildlife Wing in the Forest and Environment Department, Government of Meghalaya may therefore take necessary actions for notification of the *Law Adong Wah Rangmuh* as a Community Reserve.

3.18.9.3 Boundary Demarcation

Boundary of the *Law Adong Wah Rangmuh* has not been physically demarcated on the ground. To avoid and to ensure early detection of encroachments, boundary of the *Law Adong Wah Rangmuh*, wherever it is not constituted by features of permanent nature, may be demarcated by erection of RCC boundary pillars and painting of rings on stem of trees standing on the boundary.

3.18.9.4 Fire Protection

As per the Meghalaya Forest Fire Information System developed by the North Eastern Space Application Centre (NESAC), no fire incident has occurred in the *Law Adong Wah Rangmuh* during a period of last 22 years from 2002 to 2024. As per the said System a major part of the *Law Adong Wah Rangmuh* has 'Low' vulnerability to forest fires. Similarly, as per the said information system, a major part of the *Law Adong Wah Rangmuh* is moderately prone to forest fire which is inherent for this forest type. To prevent damage to the *Law Adong Wah Rangmuh* from accidental forest fire, measures such as creation and periodic cleaning of fire line along the periphery and at critical locations within the *Law Adong Wah Rangmuh* and engagement of fire watchers during the critical months may be taken.

3.18.9.5 Construction of Soil Moisture Conservation and Water Harvesting Structures

Two streams namely; *Wah Puriang* and *Wah Rangmuh* flow in the South and South-East boundary of the *Law Adong*, *i.e.* to improve moisture regime in this forest appropriate soil and water conservation measures such as construction of check dams and contour trench across the slope at suitable locations must be undertaken. Improved water regime will not only promote natural regeneration but will also attract wildlife.

3.18.9.6 Creation of Eco-Tourism Facilities

To create awareness about rich biodiversity of the *Law Adong Wah Rangmuh* and also to create livelihood opportunities for local residents, eco-tourism facilities such as rain shelter cum view point, footpath/ walking trail, sign board, washrooms *etc.* may be constructed to attract visitors.

3.18.9.7 Restocking of Degraded Areas

Efforts may be made to restock the degraded patches in *Law Adong Wah Rangmuh* by assisting and promoting natural regeneration of native species. Areas which cannot be restocked by natural regeneration alone may be restocked by planting seedlings of native species.

3.18.9.8 Formulation of A Proposal and Registration Thereof on Carbon Registry to Earn Carbon Credits

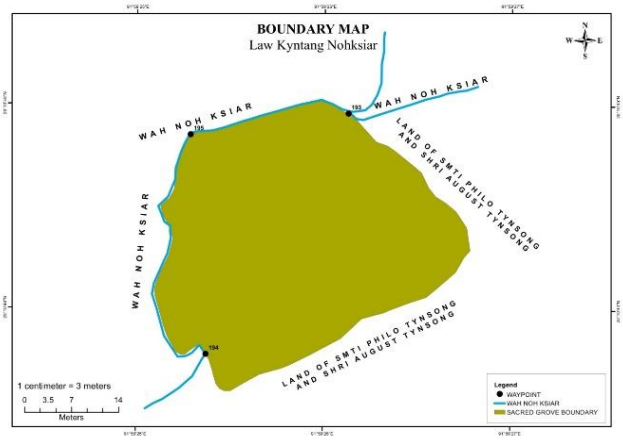
To reward the local communities for their efforts in conservation and protection of *Law Adong Wah Rangmuh* for centuries, a proposal may be formulated and registered on an appropriate carbon registry to earn carbon credits for measures to be taken by the local communities for better protection and conservation of the *Law Adong Wah Rangmuh*.

3.18.9.9 Awareness Campaign

The *Law Adong Wah Rangmuh* has been protected by the local communities for centuries for spiritual, conservation and cultural beliefs. With gradual subordination of these principles and beliefs, local communities' concern for conservation and protection of sacred groves and other community owned forests is gradually eroding. The same therefore needs to be revived and strengthened by creating awareness among the local communities and grassroot level institutions about cultural, ecological and economic importance of sacred groves and other community owned forests.

3.19. *LAW KYNTANG NOHKSIAR*

3.19.1 Location



Law Kyntang Nohksiar is situated in East Khasi Hills District of Meghalaya at *Umkrem* village under *Hima Khyrim* Syiemship. It covers an area of 0.13 ha and lies between 25° 10′43" to 25° 10′ 45″ N latitude and 91° 59′ 25″ to 91° 59′ 279″ E longitude with an altitude of 20 m above mean sea level. It is bounded in the North-West by *Wah Nohksiar* stream and in the South-East by land of Smti. Philo Tynsong and Shri. August Tynsong. The grove is accessible by Shillong-*Umkrem* Road. It is located at a distance of about 80 km from Shillong.

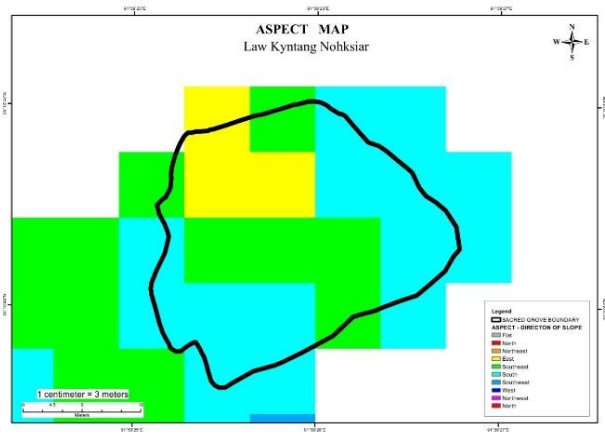


3.19.2 Brief History

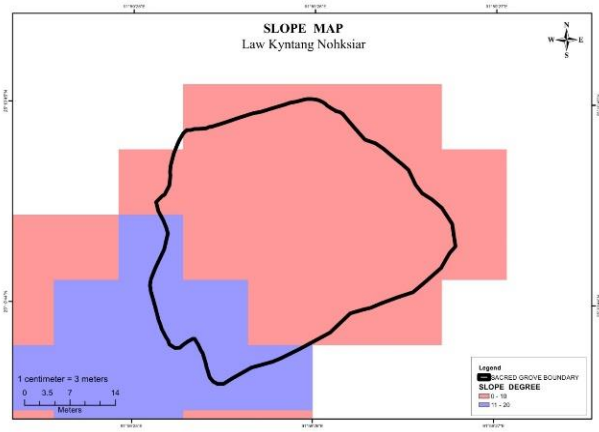
Law Kyntang Nohksiar is in existence for several centuries. There are no records available to establish its origin, as informed by the clan members, the forest is managed and administered by the clan through the *Raid Mukertilla*. In the past, religious rituals were performed in this grove by the *Lyngdoh* of the *Nohksiar* clan. However, currently no such rituals are performed in this forest. The clan still preserve this relic forest for the environmental benefits. Biotic pressure such as encroachments, hunting, poaching and illegal felling of trees are found to be absent in this forest.

3.19.3 Geography and Climate

Topography of the grove is gentle rolling in nature with slope varying from 0.1° to 12°. Major part of the *Law Kyntang Nohksiar* falls under Southern, Eastern and South-East aspects. Soil texture is sandy with no coarse fragments. Soil consistency is slightly compact. Soil is brown in colour and soil depth is shallow ranging from 15 cm to 30 cm.



Winter season starts from October end and lasts till March. It receives very high rainfall during the monsoon season from April to September.



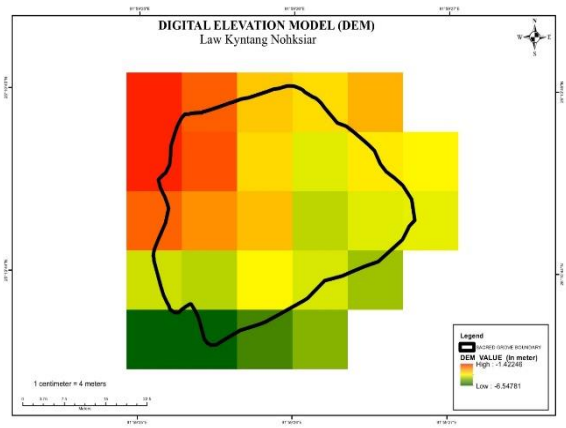
3.19.4 Forest Type

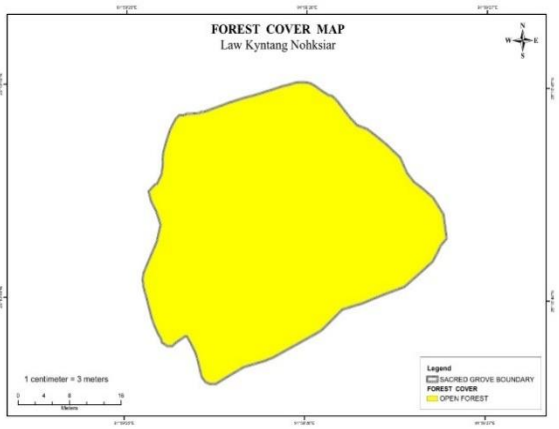
As per the Champion and Seth classification (1968), forests found in the sacred grove are of the ***Type 1B/C3 CacharTropical Evergreen Forest.***

3.19.5 Forest Cover

As per the India State of Forest Report-2021 published by the Forest Survey of India, Dehradun, forest cover in the *Law Kyntang Nohksiar* is as below:

Forest Cover	**Area (ha.)**	**% of total Area**
Very Dense Forest (> 70%)	0	0
Moderately Dense Forest (40 %-70 %)	0	0
Open Forest (10% - 40%)	0.13	100
Scrub Forest (<10%)	0	0
Non-Forest	0	0
Total	**0.13**	**100**





3.19.6 Flora and Fauna

The *Law Kyntang Nohksiar* is home to degraded forest of natural origin. *Caryota urens* and *Pyrularia edulis* are respectively 1st and 2nd dominant tree species. Few rare, endangered and endemic plant species are naturally found in this forest.

3.19.6.1: Floral species

Table 3.19.1: Trees found in *Law Kyntang Nohksiar*

Sl. No.	Local Name	Botanical Name	Family
1.	*Dieng sohlymbaw*	*Annona reticulata*	*Annonaceae.*
2.	*Dieng sohshram*	*Artocarpus lacucha*	*Moraceae*
3.	*Dieng sohkharoit*	*Aspidopterys nutans*	*Malpighiaceae*
4.	*Dieng jalong*	*Bauhinia variegata*	*Fabaceae*
5.	*Dieng lakhiat*	*Callicarpa arborea*	*Verbanaceae*
6.	*Dieng tlai*	*Caryota urens*	*Arecacea*
7.	*Dieng tyngkrong*	*Cyathea spinulosa*	*Cyatheaceae*
8.	*Dieng pylleng shrieh*	*Dysoxylum binectariferum*	*Meliaceae*
9.	*Dieng basier*	*Ehretia accuminata*	*Boraginaceae*
10.	*Dieng sohkhyllam*	*Elaeocarpus lanceaefolios*	*Elaeocarpaceae*
11.	*Dieng sohpylleng blang*	*Elaeocarpus pumifolus*	*Elaeocarpaceae*
12.	*Dieng song*	*Erythrina indica*	*Leguminoseae*
13.	*Dieng sohum*	*Eugenia jambolana*	*Myrtaceae*
14.	*Dieng sohryngkoh*	*Fagracea ceilamiea*	*Clusiaceae*
15.	*Dieng sohjyllop*	*Ficus sarmentosa*	*Moraceae*
16.	*Dieng sohlawait*	*Garcinia cowa*	*Moraceae*
17.	*Dieng sohlap*	*Glochidion khasiana*	*Phyllanthaceae*

18.	*Dieng ksain*	*Glycosmis pentaphylla*	*Rutaceae*
19.	*Dieng sohlap*	*Hydrocarpus kurzii*	*Achariaceae.*
20.	*Dieng er/ther*	*Lagerstroemia spaciosa*	*Lythraceae*
21.	*Dieng pdem*	*Persea petiolaris*	*Lauraceae*
22.	*Dieng klong*	*Pyrularia edulis*	*Santalaceae*
23.	*Dieng latyngkien*	*Schefflera wallichiana*	*Araliaceae*
24.	*Dieng tluh*	*Sterculia villosa*	*Malvaceae*
25.	*Dieng iong*	*Symplocos chinensis*	*Symplocaceae*
26.	*Dieng bti*	*Toona ciliata*	*Meliaceae*
27.	*Dieng shang*	*Vaccinium spp*	*Ericaceae*

Table 3.19.2: Shrubs found in *Law Kyntang Nohksiar*

Sl No.	Local Name	Botanical Name	Family
1.	*Dieng shaidmoit*	*Wendlandia wallichi*	*Rubiaceae*
2.	*Dieng pyrshit*	*Eurya acuminata*	*Theaceae*
3.	*Dieng lakba*	*Polygala aridatta*	*Polygalaceae*
4.	*Dieng La jaremlieh*	*Clerodendrum viscosum*	*Verbenaceae*
5.	*Dieng tait*	*Cyanotis vaga*	*Commelinaceae*

Table 3.19.3: Herbs found in *Law Kyntang Nohksiar*

Sl No.	Local Name	Botanical Name	Family
1.	*Sohbyrthit*	*Urena labota*	*Malvaceae*
2.	*Soh ngankhlaw*	*Solanum lorvum*	*Solanaceae*
3.	*Jalynthem*	*Polygonum chinensis*	*Polygonaceae*
4.	*Soh krismas*	*Sarcandra glabra*	*Zingiberaceae*
5.	*Khliang syiar*	*Centella asiatica*	*Apiaceae*
6.	*Sying khlaw*	*Zingiber purpureum*	*Zingiberaceae*

Table 3.19.4: Climbers found in *Law Kyntang Nohksiar*

Sl No.	Local Name	Botanical Name	Family
1.	*Jyrmi shiah*	*Znthoxylum khasianan*	*Rutaceae*
2.	*Jyrmi pew shrieh*	*Hedera nepalensis*	*Araliaceae*
3.	*Sla kyndajyrmi*	*Pothos spp*	*Aralaceae*
4.	*Jyrmi phan synreh*	*Dioscorea alata*	*Dioscoreaceae*
5.	*Jyrmi sohlah*	*Gynura bicoar*	*Asteraceae*
6.	*Phan jyrmi*	*Stephania glabra*	*Liliaceae*

Table 3.19.5: Ferns found in *Law Kyntang Nohksiar*

Sl No.	Local Name	Botanical Name	Family
1.	*Tyrkhang khlaw*	*Cyathea gigantia*	*Cyatheaceae*
2.	*Tyrkhang maw*	*Cyathea gigantean*	*Cyatheaceae*
3.	*Tyrkhang iong*	*Adiantum raddeanum*	*Pleridaceae*
4.	*Tyrkhng nar*	*Lophosoria quadripinnata*	*Dicksoniaceae*

Table 3.19.6: Bamboo found in *Law Kyntang Nohksiar*

Sl No.	Local Name	Botanical Name	Family
1.	*Siej skong*	*Bambusa tulda*	*Poaceae*

Table 3.19.7: Grasses found in *Law Kyntang Nohksiar*

Sl No.	Local Name	Botanical Name	Family
1.	*Phlang thyrnia*	*Arendenella pumila*	*Poaceae*
2.	*Phlang tylli*	*Arendenella khasiana*	*Poaceae*
3.	*Phlang jem*	*Hedyotis uncinalla*	*Rubeaceae*
4.	*Phlang ot*	*Juncus effusus*	*Juncaceae*

3.19.6.2 Faunal Species

No scientific study to assess presence and abundance of wildlife in *Law Kyntang Nohksiar* has been carried out so far. However, as per the local residents, presence of some wild animals has been reported in this forest.

3.19.7 Growing Stock

As per the methodology described in Chapter-II, enumeration was carried out in 100% area of the forest as its area is less than 2 ha. All the trees, having girth (over bark) at breast height more than 30 cm were enumerated by measuring the top height (in meters) and the girth at breast height (in centimetres). Data collected during the enumeration were entered in the Sacred Groves Description Form and Plot Enumeration Form. During the enumeration within the grove, data were collected for 62 trees consisting of 12 *Caryota urens* (1st dominant), 7 *Pyrularia edulis* (2nd dominant), 6 *Dysoxylum binectariferum* (3rd dominant) and 37 trees of the rest of the species. Using the Local Volume Equations given in Chapter –II, girth class wise volume was calculated for each species for each of the 13 girth classes starting from 30-40 cm to 151 cm and above. Details of the same are given in the Table 3.19.8 below. As may be seen, total growing stock in this forest is 33.26 cubic metres.

Table 3.19.8: Species wise distribution of growing stock in different girth classes

(cum)

Girth class (cm)	*Caryota urens* (1st dominant)	*Pyrularia edulis* (2nd dominant)	*Dysoxylum binectariferum* (3rd dominant)	Rest of the species	Total	% of total growing stock
30-40	0.00	0.00	0.09	0.25	**0.34**	**1.02**
41-50	0.00	0.00	0.17	1.49	**1.66**	**4.99**
51-60	0.00	0.23	1.06	2.12	**3.41**	**10.25**
61-70	1.19	0.33	0.00	1.97	**3.49**	**10.49**
71-80	2.72	0.51	0.00	1.09	**4.32**	**12.99**
81-90	2.97	0.00	0.00	3.84	**6.81**	**20.48**
91-100	0.00	0.00	0.00	0.87	**0.87**	**2.62**
101-110	0.00	3.56	0.00	1.23	**4.79**	**14.40**
111-120	0.00	1.35	0.00	1.35	**2.70**	**8.12**
121-130	0.00	0.00	0.00	0.00	**0.00**	**0.00**
131-140	0.00	0.00	0.00	0.00	**0.00**	**0.00**
141-150	0.00	0.00	0.00	0.00	**0.00**	**0.00**
151 & above	0.00	0.00	0.00	4.87	**4.87**	**14.64**
Total	**6.88**	**5.98**	**1.32**	**19.08**	**33.26**	**100.00**
% of total growing stock	20.69	17.98	3.97	57.37	100.00	

As may be seen, 20.69%, the total growing stock is contributed by the 1st dominant species (*Caryota urens)*. The 2nd dominant species (*Pyrularia edulis*) constitutes 17.98% of the total growing stock. Similarly, the 3rd dominant species *(Dysoxylum binectariferum)* constitutes 3.97 % of the total growing stock. A major part of the growing stock (*i.e*. 57.37 %) is constituted by the rest of the species.

igure 3.19.1:Girth class-wise distribution of growing stock

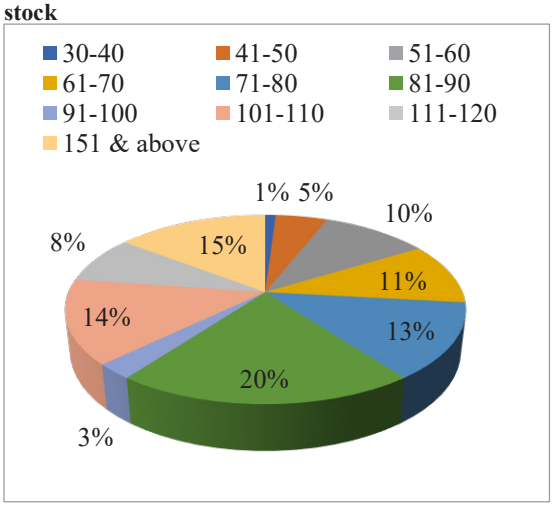


Figure 3.19.2: Species-wise distribution of growing stock

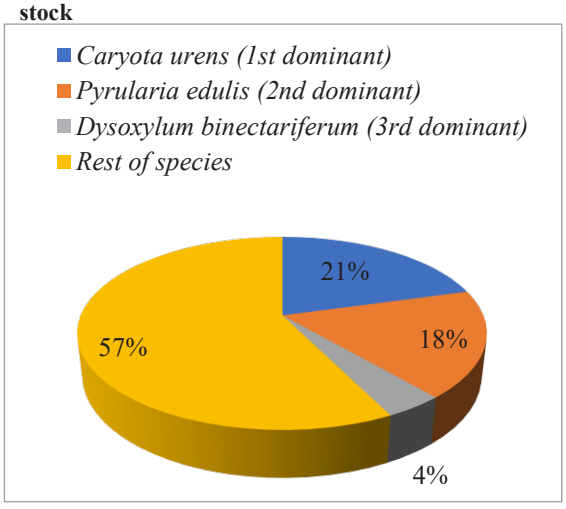


Figure 3.19.3:Girth class-wise distribution of growing stock

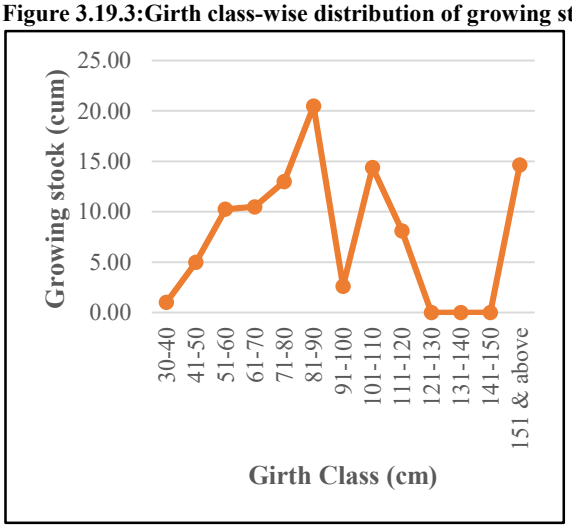
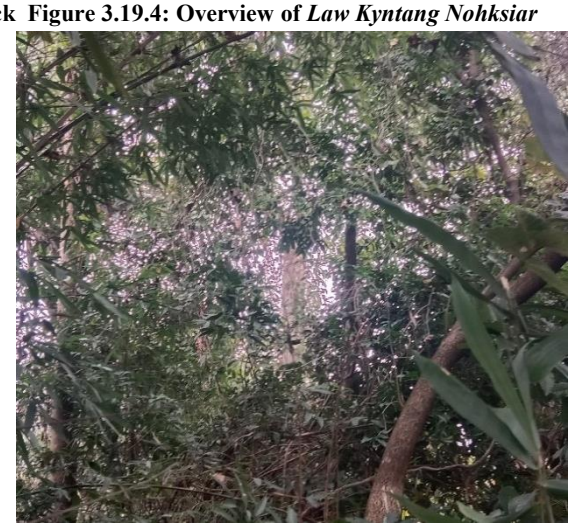


Figure 3.19.4: Overview of *Law Kyntang Nohksiar*



3.19.8 Number of Stems

Species-wise number of stems in each girth class are given in Table 3.19.9 below. As may be seen maximum numbers of stems are found in lower girth classes *i.e.* from 41-50 cm to 81-90 cm.

Table 3.19.9: Species-wise Distribution of stems in different girth classes

(numbers of stems)

Girth class (cm)	*Caryota urens* (1st dominant)	*Pyrularia edulis* (2nd dominant)	*Dysoxylum binectariferum* (3rd dominant)	Rest of species	Total
30-40	0	0	1	4	**5**
41-50	0	0	1	9	**10**
51-60	0	1	4	8	**13**
61-70	3	1	0	5	**9**
71-80	5	1	0	2	**8**
81-90	4	0	0	5	**9**
91-100	0	0	0	1	**1**
101-110	0	3	0	1	**4**
111-120	0	1	0	1	**2**
121-130	0	0	0	0	**0**
131-140	0	0	0	0	**0**
141-150	0	0	0	0	**0**
151 & above	0	0	0	1	**1**
Total	**12**	**7**	**6**	**37**	**62**

Figure 3.19.5:Number of stems in different girth classes

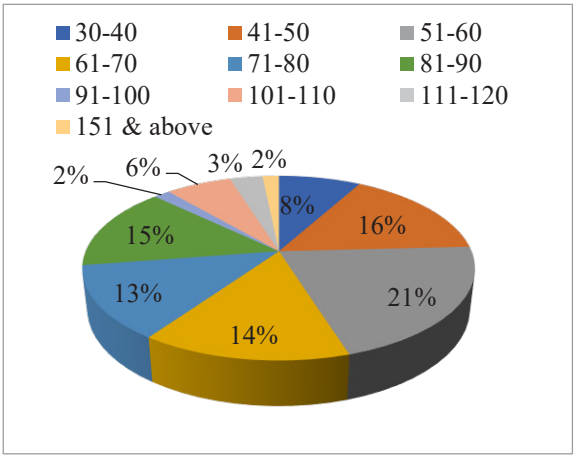


Figure 3.19.6: Species-wise distribution of stems

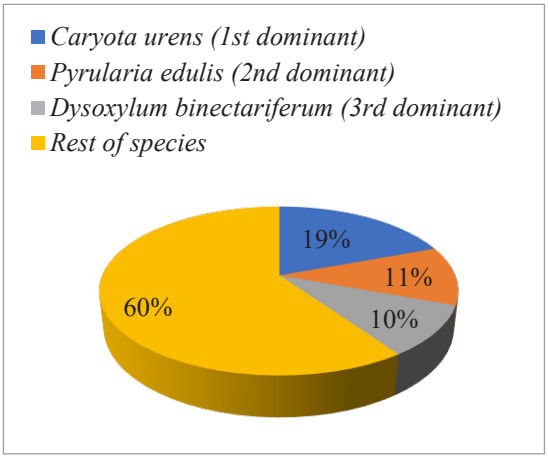


Figure 3.19.7:Number of stems in different girth classes

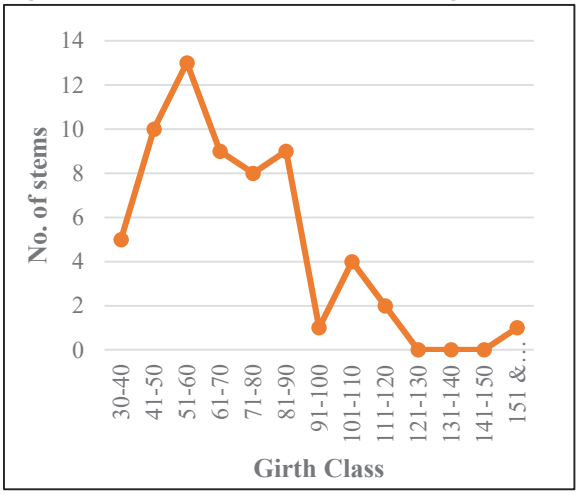


Figure 3.19.8: Inside view of *Law Kyntang Nohksiar*



3.19.9 Prescriptions for Future Management

3.19.9.1 Registration with the Khasi Hills Autonomous District Council

The United Khasi-Jaintia Hills Autonomous District (Management and Control of Forests) Rules, 1960 provides for registration of each *Law Kyntang* located in areas falling under jurisdiction of the Khasi Hills Autonomous District Council (KHADC). Though these rules came into force about 65 years ago, the *Law Kyntang Nohksiar* has not been registered with the KHADC. The Chief Forest Officer of the KHADC and village dorbar of Umkrem village may take immediate necessary actions, as provided in Chapter-I of the said rules to register the *Law Kyntang Nohksiar* with the KHADC. The same will accord legal recognition and protection from diversion for non-forestry purposes.

3.19.9.2 Notification as Community Reserve

Section 38C of the Wild Life (Protection) Act, 1972 provides that the State Government may, where the community or an individual has volunteered to conserve wild life and its habitat, declare any private or community land not comprised within a National Park, Wildlife Sanctuary or a Conservation Reserve, as a Community Reserve, for protecting fauna, flora and traditional or cultural conservation values and practices. Notification of an area as a Community Reserve accords it legal protection. It will also make it eligible to receive financial assistance under Centrally Sponsored Scheme of 'Integrated Development of Wildlife Habitats'. The village dorbar of Umkrem village *and* Wildlife Wing in the Forest and Environment Department, Government of Meghalaya may therefore take necessary actions for notification of the *Law Kyntang Nohksiar* as a Community Reserve.

3.19.9.3 Boundary Demarcation

Boundary of the *Law Kyntang Nohksiar* has not been physically demarcated on the ground. The grove is bounded in the South-East by land of Smti. Philo Tynsong and August Tynsong. To prevent and to ensure early detection of encroachments of the boundary of *Law Kyntang Nohksiar* may be demarcated by erection of RCC boundary pillars and painting of rings on stem of trees standing on the boundary.

3.19.9.4 Fire Protection

As per the Meghalaya Forest Fire Information System developed by the North Eastern Space Application Centre (NESAC) during a period of 22 years from 2002 to 2024 no fire incident has occurred in the *Law Kyntang Nohksiar***.** As per the said information system the *Law Kyntang Nohksiar*is has 'Very Low' vulnerability to forest fires. As per the said information system, a major part of *Law Kyntang Nohksiar* is not prone to forest fire. However, to prevent damage to the *Law Kyntang Nohksiar* from accidental forest fires, measures such as creation and periodic cleaning of fire line along the periphery and at critical locations within the *Law Kyntang Nohksiar* and engagement of fire watchers during the critical months may be undertaken.

3.19.9.5 Construction of Soil Moisture Conservation and Water Harvesting Structures

Wah Nohksiar is the only stream which flows in the North-West side of this *Law Kyntang Nohksiar*. To prevent and minimise soil erosion and to improve moisture regime, construction of check dam, contour trench, may be constructed at suitable locations in the *Law Kyntang Nohksiar.* Improved water regime will promote natural regeneration and will also attract wildlife.

3.19.9.6 Creation of Eco-Tourism Facilities

To create awareness about biodiversity of the *Law Kyntang Nohksiar* and also to create livelihood opportunities for local residents, eco-tourism facilities such as rain shelter cum view point, footpath/ walking trail, sign board, washrooms *etc.* may be provided to attract visitors.

3.19.9.7 Restocking of Degraded Areas

Efforts may be made to restock the degraded patches in *Law Kyntang Nohksiar* by assisting and promoting natural regeneration of native species. Areas which cannot be naturally regenerated may be afforested by planting seedlings of native species.

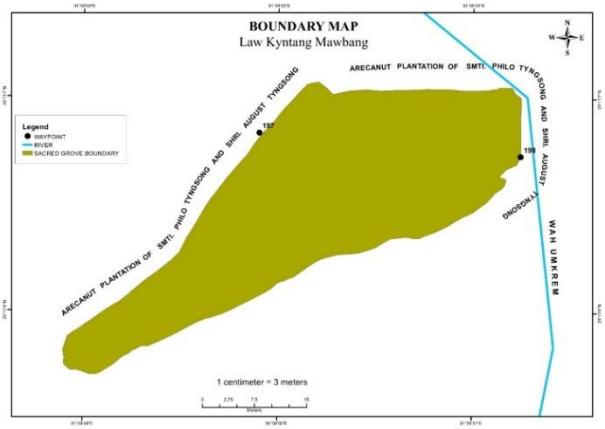
3.19.9.8 Formulation of A Proposal and Registration Thereof on Carbon Registry to Earn Carbon Credits

To reward the local communities for their efforts in conservation and protection of *Law Kyntang Nohksiar* for centuries, a proposal may be formulated and registered on an appropriate carbon registry to earn carbon credits for measures to be taken by the local communities for better protection and conservation of the *Law Kyntang Nohksiar*.

3.19.9.9 Awareness Campaign

The *Law Kyntang Nohksiar* has been protected by the ancestors of the clan for centuries for spiritual, ecological and cultural beliefs. With gradual subordination of these beliefs, the clan concern for conservation and protection of sacred groves and other community owned forests is gradually declining. The same therefore need to be revived and strengthened by creating awareness among the clan and local communities and grass root level institutions about cultural, ecological and economic importance of sacred groves and other community owned forests.

3.20. *LAW KYNTANG MAWBANG*



3.20.1 Location

Law Kyntang Mawbang is located in East Khasi Hills District of Meghalaya at *Umkrem* village under *Hima Khyrim* Syiemship. It covers an area of 0.12 ha and lies between 25° 11.5" to 25° 11.7″ N latitude and 91° 59′ 51″ to 91° 59′ 54″ E longitude with an altitude of 23 m above mean sea level. It is bounded in the North-West and North East by Arecanut Plantation of Smti Philo Tynsong and August Tynsong and in the South East by *Umkrem* stream. It is about 80 km from Shillong via Pynursla road.

3.20.2 Brief History

Law Kyntang Mawbang has been in existence of several decades. In the past religious rituals were performed in this grove and the forest was protected for the religious need of the *Kur*. However, currently no such rituals are performed in this *Law kyntang*. The grove is administered and managed by the *Kur* (clan) elders. Green felling of trees is strictly prohibited by the clan.

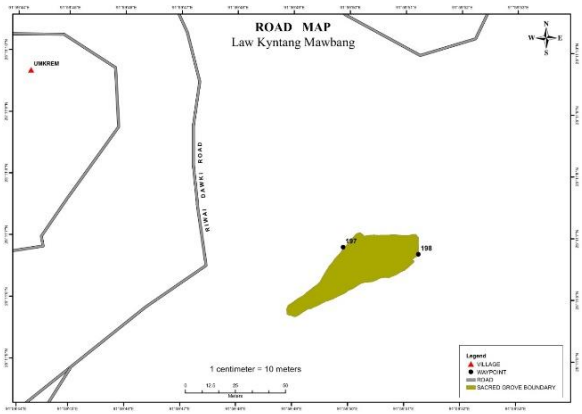
Biotic pressures such as encroachments, hunting, poaching and illegal felling of trees are absent in this forest.

3.20.3 Geography and Climate



Topography of the grove is undulating in nature with slope varying from 0.7° to 33°. Major area of the *Law Kyntang Mawbang* falls under the Eastern and North-East aspects. Small area of the forest falls under the Southern aspect. Soil texture is sandy with no coarse fragments. Soil consistency is slightly compact. The colour of the soil is brown and soil depth is shallow. Stoniness is moderate.

Winter season starts from October end and last till February of the next year. It receives high rainfall during the monsoon season from April to September end.

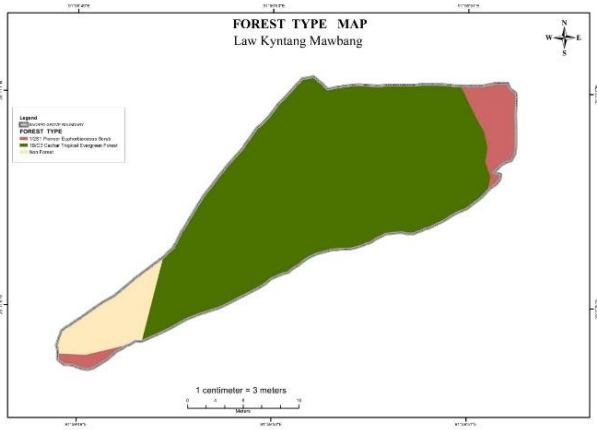


3.20.4 Forest Type

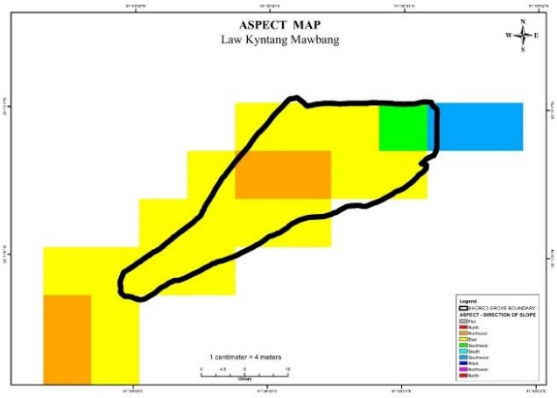
As per the Champion and Seth classification (1968), forests found in the sacred grove are of the ***Type 1B/C3 CacharTropical Evergreen Forest*** and ***1/2S1 Pioneer Euphorbiaceous Scrub.***

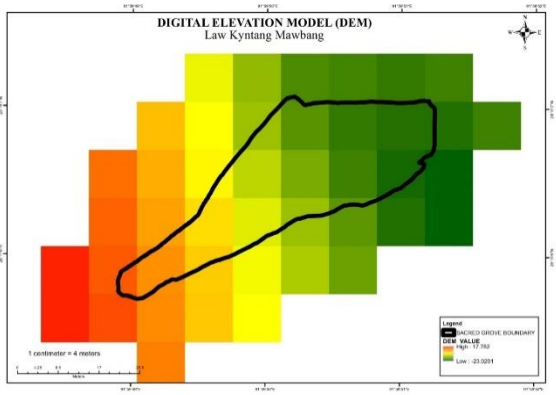
3.20.5 Forest Cover

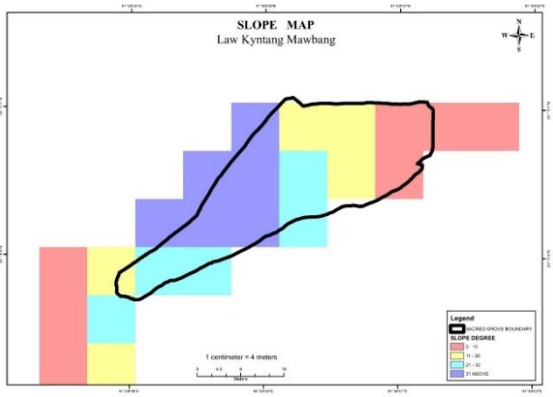
As per the India State of Forest Report-2021 published by the Forest Survey of India, Dehradun, forest cover in the *Law Kyntang Mawbang* is as below:



Forest Cover	Area (ha.)	% of total Area
Very Dense Forest (> 70%)	0	0
Moderately Dense Forest (40 %-70 %)	0	0
Open Forest (10% - 40%)	0.11	100.00
Scrub Forest (<10%)	0	0
Non-Forest	0	0
Total	**0.11**	**100**







3.20.6 Flora and Fauna

The *Law Kyntang Mawbang* is home to open forest of natural origin. *Bauhinia variegata* and *Toona ciliata* are respectively 1st and 2nd dominant tree species. The forest is home to a few rare, endangered and endemic plant species.

3.20.6.1: Floral species

Table 3.20.1: Trees found in *Law Kyntang Mawbang*

Sl. No.	Local Name	Botanical Name	Family
1.	*Dieng shram*	*Artocarpus chaplasha*	*Moraceae*
2.	*Dieng sohphan*	*Artocarpus integrifolia*	*Moraceae*

3.	*Dieng shram*	*Artocarpus lakoocha*	*Moraceae*
4.	*Dieng jalong*	*Bauhinia variegata*	*Fabaceae*
5.	*Dieng tlai*	*Caryota urens*	*Arecaceae*
6.	*Dieng tyrthia*	*Cinnamomum pauciflorum*	*Lauraceae*
7.	*Dieng basier*	Ehretia acumita	*Boraginaceae*
8.	*Dieng lba*	*Engelhardtia spicata*	*Juglandaceae*
9.	*Dieng shrong/song*	*Erythrina indica*	*Leguminoseae*
10.	*Dieng sohlwa*	*Eugenia aquea*	*Myrtaceae*
11.	*Dieng sohswet*	*Ficus benghalensis*	*Moraceae*
12.	*Dieng sohlawait*	*Garcinia cowa*	*Clusiaceae*
13.	*Dieng dkhiah*	*Gmelina arborea*	*Lamiaceae*
14.	*Dieng sohmeblang*	*Grewia abutilifolia*	*Tiliaceae*
15.	*Dieng jali*	*Ilex godajam*	*Aquifoliaceae.*
16.	*Dieng lakhar*	*Macaranga denticulata*	*Euphorbiaceae*
17.	*Dieng sohphie nam*	*Myrica nagi*	*Myricaceae*
18.	*Dieng kharai*	*Schoepfia fragrans*	*Schoepfiaceae*
19.	*Dieng bti*	*Toona ciliata*	*Meliaceae*

Table 3.20.2: Shrubs found in *Law Kyntang Mawbang*

Sl No.	Local Name	Botanical Name	Family
1.	*Dieng jaremlieh*	*Clerodendrum viscosum*	*Verbenaceae*
2.	*Dieng sohpyrsit*	*Eurya acuminata*	*Theaceae*
3.	*Dieng sohjabuit*	*Phlogacanthusthyrsiflorus*	*Acanthaceae*
4.	*Dieng jamyrait*	*Gaultheria fragranitissima*	*Ericaceae*
5.	*Dieng Jarem iong*	*Clerodendrum colebrookianum*	*Verbenaceae*
6.	*Synsar*	*Thysanolaena maxima*	*Poaceae*
7.	*Kait khlaw*	*Musa acuminate*	*Musaceae*
8.	*Sohlang*	*Viburnum foetidum*	*Caprifoliaceae*

Table 3.20.3: Herbs found in *Law Kyntang Mawbang*

Sl No.	Local Name	Botanical Name	Family
1.	*Tyrkhang*	*Asplenium nidus*	*Aspleniaceae*
2.	*Jajewkhlaw*	*Begonia roxburghii*	*Begoniaceae*
3.	*Wang khlaw*	*Esculenta spp.*	*Araceae*
4.	*Phudwang*	*Colocasia spp.*	*Araceae*
5.	*Synraikhlaw*	*Alpinia spp.*	*Gingiberaceae*
6.	*Sohbyrthit*	*Urena labota*	*Malvaceae*

7.	*Sying khlaw*	*Zingiber purpureum*	*Zingiberaceae*
8.	*Bat eroplain*	*Inuala cappa*	*Asteraceae*
9.	*Sla lamet*	*Phyrnium pubineve*	*Marantaceae*
10.	*Dieng sohmatan*	*Stephania glabra*	*Menispeernaceae*

Table 3.20.4: Climbers found in *Law Kyntang Mawbang*

Sl No.	Local Name	Botanical Name	Family
1.	*Jyrmi kophi khlaw*	*Coffea jenkinsii*	*Rubiaceae*
2.	*Jyrmi Pew shrieh*	*Hedera nepalensis*	*Araliaceae*
3.	*Jyrmi sla kynda*	*Pothoss candens*	*Araceae*
4.	*Jyrmi loapla*	*Rhaphidophora decursiva*	*Araceae*
5.	*Jyrmi sohmatan*	*Stephania glabra*	*Menispermaceae*
6.	*Jyrmi sohpairew*	*Rubus elleplicus*	*Rosaceae*

Table 3.20.5: Orchids found in *Law Kyntang Mawbang*

Sl No.	Local Name	Botanical Name	Family
1.	*Tiew talong. khnai*	*Oberoniaob cordata*	*Orchidaceae*
2.	*Dieng tiew mationg*	*Dendrobium chrysanthum,*	*Orchidaceae*
3.	*Tiew talong khnai*	*Oberonia mannii*	*Orchidaceae*
4.	*Knupmawiang*	*Paphiopedium insigne*	*Orchidaceae*
5.	*Tiew dohmaw*	*Anoectochilus roxburghii*	*Orchidaceae*
6.	*Tiew dieng*	*Dendrobium aphylum*	*Orchidaceae*

Table 3.20.6: Bamboos found in *Law Kyntang Mawbang*

Sl No.	Local Name	Botanical Name	Family
1.	*Siej sken*	*Bambusa allida*	*Poaceae*
2.	*Kdait namlang*	*Chimonabambusa khasiana*	*Arecaeae*

Table 3.20.7: Ferns found in *Law Kyntang Mawbang*

Sl No.	Local Name	Botanical Name	Family
1.	*Jyrmi sohlah*	*Gynura bicoar*	*Asteraceae*
2.	*Jyrmi siah soh krot*	*Smilax zeylanica*	*Smilacaceae*
3.	*Jyrmi jamiaw*	*Var prostrate*	*Amaranthaceae*
4.	*Jyrmi sohpairew*	*Rubus elleplicus*	*Rosaceae*

3.20.6.2 Faunal Species

No scientific study to assess presence and abundance of wildlife in *Law Kyntang Mawbang* has been carried out so far. However, as per the local residents, presence of some wild animals has been reported in this forest.

3.20.7 Growing Stock

As per the methodology described in Chapter-II, enumeration was carried out in 100% area of the forest as its area is more than 2 ha. All the trees, having girth (over bark) at breast height more than 30 cm, were enumerated by measuring the top height (in meters) and the girth (in centimetres) at breast height. Data collected during the enumeration were entered in Sacred Groves Description Form and Plot Enumeration Form. During the enumeration within the grove, data were collected for 51 trees consisting of 6 *Bauhinia variegate* (1st dominant), 6 *Toona ciliata* (2nd dominant), 5 *Erythrina indica* (3rd dominant), and 34 *Rest of Species*. Using the Local Volume Equations given in Chapter –II, girth class wise volume was calculated for each species for each of the 13 girth classes starting from 30-40 cm to 91-100 cm. Details of the same are given in the Table 3.20.8 below. As may be seen, total growing stock in this forest is 22.40 cubic metres.

Table 3.20.8: Species wise distribution of growing stock in different girth classes

(cum)

Girth class (cm)	*Bauhinia variegata* (1st dominant)	*Toona ciliata* (2nd dominant)	*Erythrina indica* (3rd dominant)	Rest of species	Total growing stock	% of total growing stock
30-40	0.00	0.00	0.00	0.00	**0.00**	**0.00**
41-50	0.00	0.18	0.16	0.17	**0.51**	**2.28**
51-60	0.49	0.80	0.12	1.83	**3.24**	**14.46**
61-70	0.75	0.33	0.00	3.07	**4.15**	**18.53**
71-80	0.46	0.00	0.26	4.60	**5.32**	**23.75**
81-90	0.00	0.63	0.00	3.60	**4.23**	**18.88**
91-100	0.96	0.00	0.47	3.52	**4.95**	**22.10**
101-110	0.00	0.00	0.00	0.00	**0.00**	**0.00**
111-120	0.00	0.00	0.00	0.00	**0.00**	**0.00**
121-130	0.00	0.00	0.00	0.00	**0.00**	**0.00**
131-140	0.00	0.00	0.00	0.00	**0.00**	**0.00**
141-150	0.00	0.00	0.00	0.00	**0.00**	**0.00**
151 & above	0.00	0.00	0.00	0.00	**0.00**	**0.00**
Total	**2.66**	**1.94**	**1.01**	**16.79**	**22.40**	**100.00**
% of total growing stock	11.88	8.66	4.51	74.96	100.00	

As may be seen, 11.88%, the total growing stock is contributed by the 1st dominant species (*Bauhinia variegata)*. The 2nd dominant species (*Toona ciliata*) constitutes 8.66% of the total growing stock. Similarly, the 3rd dominant species *(Erythrina indica)* is 4.51 % of the total growing stock. A major part of the growing stock (*i.e*. 74.96 %) is constituted by the rest of the species.

Figure 3.20.1:Girth class-wise distribution of growing stock

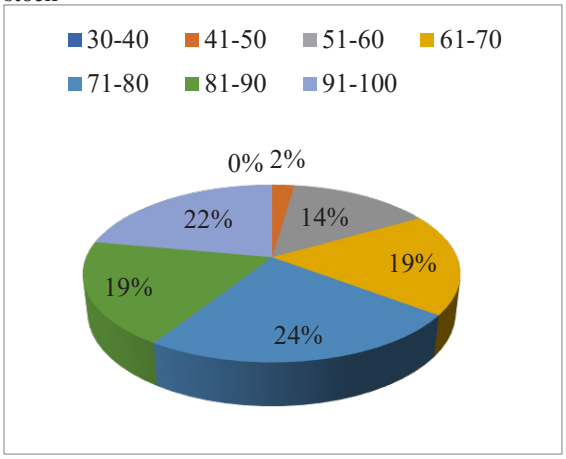


Figure 3.20.2: Species-wise distribution of growing stock

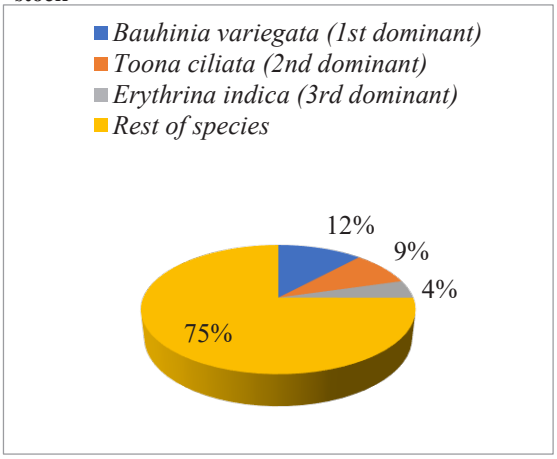


Figure 3.20.3:Girth class-wise distribution of growing stock

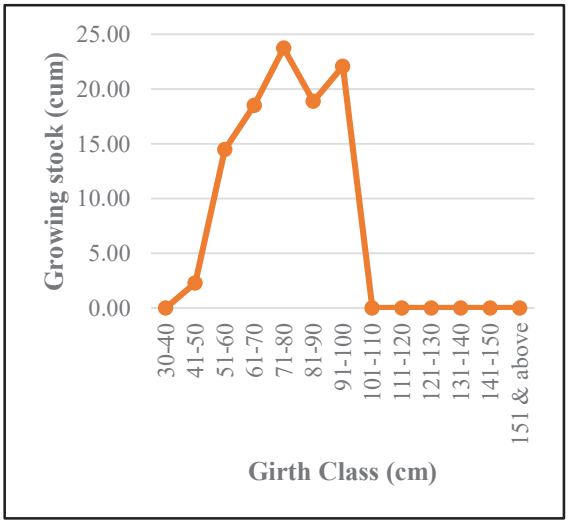


Figure 3.20.4: Overview of *Law Kyntang Mawbang*



3.20.8 Number of Stems

Species-wise number of stems in each girth class are given in Table 3.20.9 below. As may be seen maximum numbers of stems are found in mid girth classes *i.e.* from 51-50 cm to 71-80 cm.

Table 3.20.9: Species-wise distribution of stems in different girth classes

(numbers of stems)

Girth class (cm)	*Bauhinia variegata* (1st dominant)	*Toona ciliata* (2nd dominant)	*Erythrina indica* (3rd dominant)	Rest of species	Total
30-40	0	0	0	0	**0**
41-50	0	1	2	1	**4**
51-60	2	3	1	7	**13**
61-70	2	1	0	8	**11**
71-80	1	0	1	9	**11**
81-90	0	1	0	5	**6**
91-100	1	0	1	4	**6**
101-110	0	0	0	0	**0**
111-120	0	0	0	0	**0**
121-130	0	0	0	0	**0**
131-140	0	0	0	0	**0**
141-150	0	0	0	0	**0**
151 & above	0	0		0	**0**
Total	**6**	**6**	**5**	**34**	**51**

Figure 3.20.5: Number of stems in different girth classes

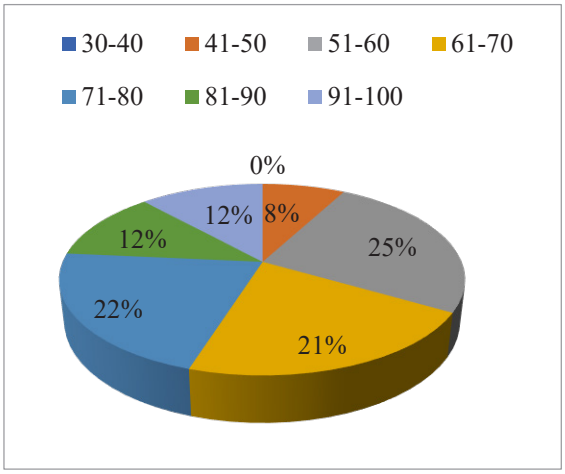


Figure 3.20.6: Species-wise distribution of stems

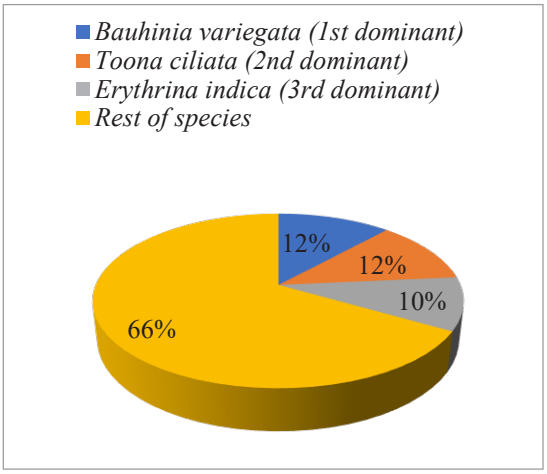


Figure 3.20.7: Number of stems in different girth classes

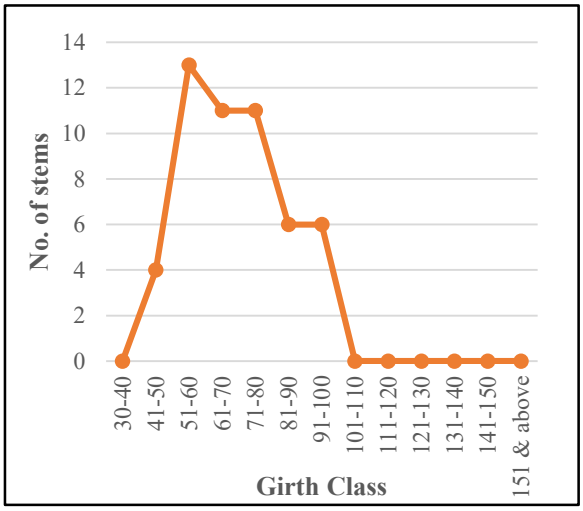


Figure 3.20.8: Inside view of *Law Kyntang Mawbang*



3.20.9 Prescriptions for Future Management

3.20.9.1 Registration with the Khasi Hills Autonomous District Council

The United Khasi-Jaintia Hills Autonomous District (Management and Control of Forests) Rules, 1960 provides for registration of each *Law Adong/Law Kyntang* located in areas falling under jurisdiction of the Khasi Hills Autonomous District Council (KHADC). Though these rules came into force about 65 years ago, the *Law Kyntang Mawbang* has not been registered with the KHADC. The Chief Forest Officer of the KHADC and the Clan leaders of the *Law Kyntang* may take immediate necessary actions, as provided in Chapter-I of the said rules to register the *Law Kyntang Mawbang* with the KHADC. The same will accord legal recognition and protection from diversion for non-forestry purposes.

3.20.9.2 Notification as Community Reserve

Section 38C of the Wild Life (Protection) Act, 1972 provides that the State Government may, where the community or an individual has volunteered to conserve wild life and its habitat, declare any private or community land not comprised within a National Park, Wildlife Sanctuary or a Conservation Reserve, as a Community Reserve, for protecting fauna, flora and traditional or cultural conservation values and practices. Notification of an area as a Community Reserve accords it legal protection. It will also make it eligible to receive financial assistance under a Centrally Sponsored Scheme of 'Integrated Development of Wildlife Habitats'. The clan representative of *Law Kyntang Mawbang* and Wildlife Wing in the Forest and Environment Department, Government of Meghalaya may therefore take necessary actions for notification of the *Law Kyntang Mawbang* as a Community Reserve.

3.20.9.3 Boundary Demarcation

Boundary of the *Law Kyntang Mawbang* has not been physically demarcated on the ground. To prevent and to ensure a detection early of encroachment of the *Law Kyntang Mawbang,* wherever boundary is not constituted by features of permanent nature, it may be demarcated by erection of RCC boundary pillars and painting of rings on stem of trees standing on the boundary.

3.20.9.4 Fire Protection

As per the Meghalaya Forest Fire Information System developed by the Northh Eastern Space application Centre (NESAC), during a period of 22 years (2002 -2024) no fire incident has occurred in the *Law Kyntang Mawbang***.** To prevent damage to the *Law Kyntang Mawbang* from accidental forest fires, measures such as creation and periodic cleaning of fire line along the periphery and at critical locations within the *Law Kyntang Mawbang* and engagement of fire watchers during the critical months may be taken.

3.20.9.5 Construction of Soil Moisture Conservation and Water Harvesting Structures

Wah Umkrem is the only stream which flows along the South-eastern boundary of *Law Kyntang Mawbang*. To prevent and minimise soil erosion and to improve moisture regime, construction of check dam, contour trench, may be constructed at suitable locations in the *Law Kyntang Mawbang.*

3.20.9.6 Creation of Eco-Tourism Facilities

To create awareness about biodiversity of the *Law Kyntang Mawbang* and also to create livelihood opportunities for local residents, eco-tourism facilities such as rain shelter cum view point, footpath/ walking trail, sign board, washrooms *etc.* may be constructed to attract visitors.

3.20.9.7 Restocking of Degraded Areas

Efforts may be made to restock the degraded areas *by* assisting and promoting natural regeneration of native species. The areas which cannot be restocked by natural regeneration regeneration alone may be restocked by planting seedlings of native species.

3.20.9.8 Formulation of a Proposal and Registration Thereof on Carbon Registry to Earn Carbon Credits

To reward the local communities for their efforts in conservation and protection of *Law Kyntang Mawbang* for centuries, a proposal may be formulated and registered on an appropriate carbon registry to earn carbon credits for measures to be taken by the local communities for better protection and conservation of the *Law Kyntang Mawbang*.

3.20.9.9 Awareness Campaign

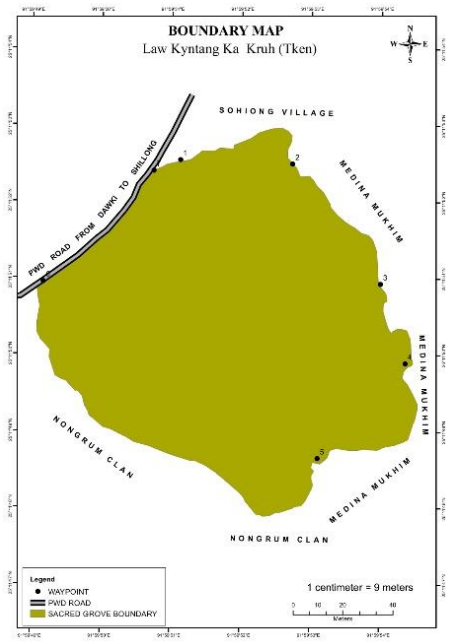
The *Law Kyntang Mawbang* has been protected by the ancestors of the clan for centuries for religious, ecological and cultural beliefs. With gradual subordination of these beliefs, clan's concern for conservation and protection of sacred groves and other community owned forests is gradually eroding. The same therefore need to be revived and strengthened by creating awareness among the

members of the clan, local communities and grass root level institutions about cultural, ecological and economic importance of sacred groves and other community owned forests.

3.21. *LAW KYNTANG KA KRUH (TKEN)*

3.21.1 Location

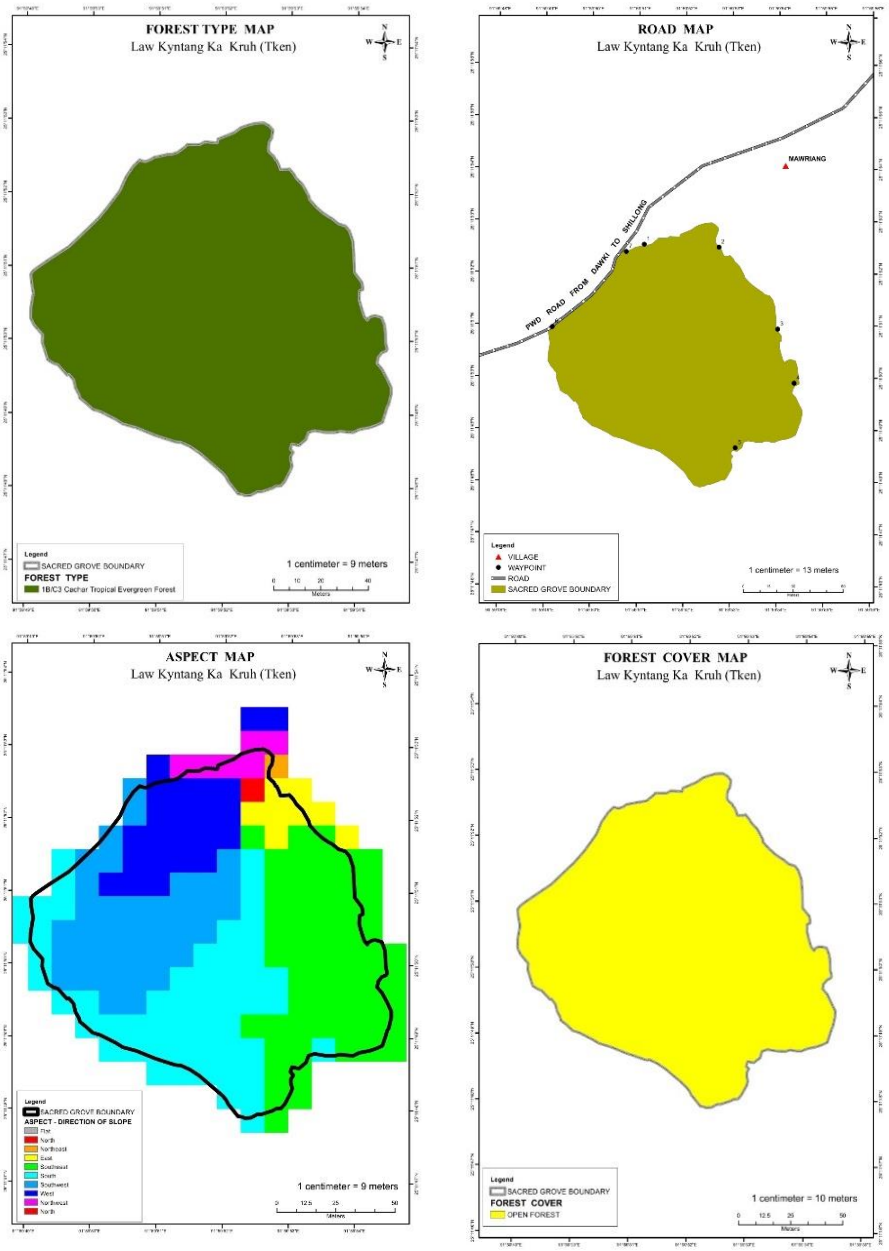
Law Kyntang Ka Kruh is located in East Khasi Hills District of Meghalaya at *Sohlong* village under *Hima Khyrim* Syiemship. It covers an area of 1.49 ha and lies between 25° 11.48" to 25° 11.52″ N latitude and 91° 59′ 49″ to 91° 59′ 54″ E longitude at an altitude of about 327 m above mean sea level. It is bounded in the North by *Sohlong* village, in the South-East private land of Smt. Medina Mukhim, in the North-West by *Dawki* to Shillong PWD Road, and in the Soth-West by land of Nongrum clan. The Grove is accessible from Shillong by Shillong-*Dawki* Road. It is about 78 km from Shillong.





3.21.2 Brief History

Law Kyntang Ka Kruh is in existence for several centuries. In the past religious rituals were performed in this grove and its protection was a was considered as a spiritual and religious necessity of the *Kur* (clan). Currently, such rituals are no longer performed, however the *Kur* (clan) still revere this forest in remembrance of ancestors and for its ecological value. The grove is administered and managed by the *Kur* (clan) elders. Green felling of trees is strictly prohibited by the clan. Biotic pressures such as encroachment, hunting, poaching and illegal felling of trees are absent in this forest.



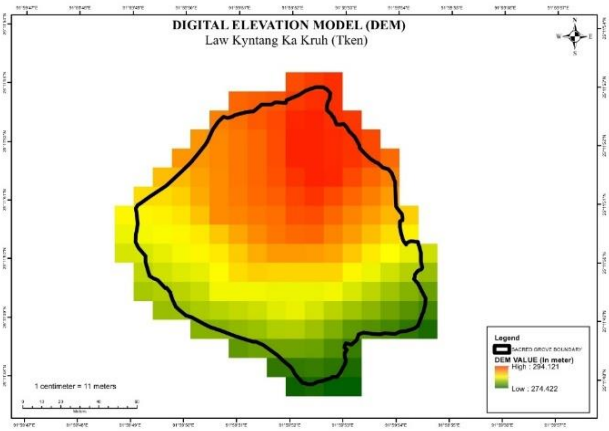
3.21.3 Geography and Climate

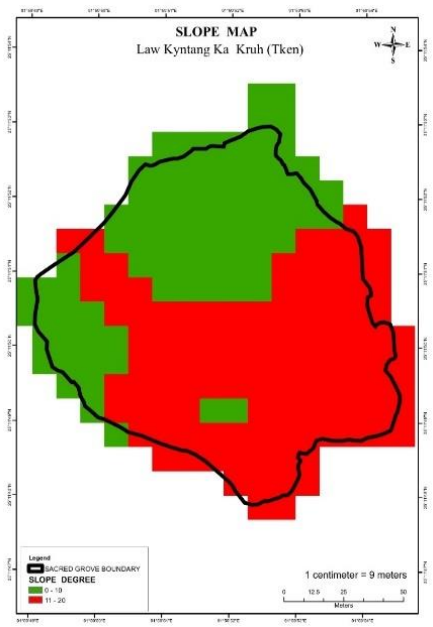
Topography of the *Law Kyntang Ka Kruh* is undulating in nature with slope varying from 0.8° to 23°. Major part of the *Law Kyntang Ka Kruh* falls under the Southeast, Southwest and Southern aspects. Soil texture is sandy with no coarse fragments. Soil consistency is slightly compact. The soil is brown in colour and the soil depth is shallow. Stoniness is high in this grove.

Winter season starts from October end and lasts till February of the next year. It receives high rainfall during the monsoon season from April till September end. The average temperature varies from 7° C to 23° C.

3.21.4 Forest Type

As per the Champion and Seth classification (1968), forests found in the sacred grove are of the ***Type 1B/C3 Cachar Tropical Evergreen Forest.***





3.21.5 Forest Cover

As per the India State of Forest Report-2021 published by the Forest Survey of India, Dehradun, forest cover in the *Law Kyntang Ka Kruh* is as below:

Forest Cover	**Area (ha.)**	**% of total Area**
Very Dense Forest (> 70%)	0	0
Moderately Dense Forest (40 %-70 %)	0	0
Open Forest (10% - 40%)	1.49	100
Scrub Forest (<10%)	0	0
Non-Forest	0	0
Total	**1.49**	**100**

3.21.6 Flora and Fauna

The *Law Kyntang Ka Kruh* is home to forest of natural origin. *Artocarpus integrifolia* and *Cinnamomum tamala* are respectively 1st and 2nd dominant tree species. The forest is home to many rare, endangered and endemic plant species.

3.21.6.1 Floral species

Table 3.21.1: Trees found in *Law Kyntang Ka Kruh*

Sl. No.	Local Name	Botanical Name	Family
1.	*Dieng jalong*	*Bauhinia variegate*	*Fabaceae*
2.	*Dieng Sohphan*	*Artocarpus integrifolia*	*Moraceae*
3.	*Dieng tlai*	*Caryota urens*	*Arecacea*
4.	*Dieng latyrpad*	*Cinnamomum tamala*	*Lauraceae*
5.	*Dieng bishna*	*Ehretia cauminata*	*Boraginaceae*
6.	*Dieng Sohlapong*	*Ficus hispida*	*Moraceae*
7.	*Dieng jri*	*Ficus nervosa*	*Moraceae*
8.	*Dieng sohlap*	*Hydrocarpus kurzii*	*Achariaceae.*
9.	*Dieng lakhar*	*Macaranga denticulata*	*Euphoribiaceae*
10.	*Dieng sohliya*	*Myrica nagi*	*Myricaceae*
11.	*Dieng sai*	*Quercus dealbata*	*Fagaceae*
12.	*Dieng iong*	*Symplocos schinensis*	*Symplocaceae*
13.	*Dieng taro*	*Tetrameles nudiflora*	*Dastiscaceae*
14.	*Dieng Bti*	*Toona ciliata*	*Meliaceae*

Table 3.21.2: Shrubs found in *Law Kyntang Ka Kruh*

Sl No.	Local Name	Botanical Name	Family
1.	*La jaremlieh*	*Clerodendrum viscosum*	*Verbenaceae*
2.	*Dieng sohpyrsit*	*Eurya acuminate*	*Theaceae*
3.	*Dieng jabuit*	*Phlogacanthus thyrsiflorus*	*Acanthaceae*
4.	*Dieng sohjaremiong*	*Clerodendrum colebrookianum*	*Verbenaceae*
5.	*Dieng ranong*	*Mahonia pycnophylla*	*Berberidaceae*
6.	*Dieng Sohlang*	*Viburnum foetidum*	*Caprifoliaceae*

Table 3.21.3: Herbs found in *Law Kyntang Ka Kruh*

Sl No.	Local Name	Botanical Name	Family
1.	*Syieng khlaw*	*Zingiber purpureum*	*Zingiberaceae*
2.	*Jajew khlaw*	*Begonia roxburghii*	*Begoniaceae*
3.	*Synrai khlaw*	*Alpinia spp*	*Gingiberaceae*
4.	*Slamet*	*Phrynium spp*	*Pubinevve*
5.	*Wang khlaw*	*Esculenta spp*	*Araceae*
6.	*Phudwang*	*Colocasia spp*	*Araceae*

Table 3.21.4: Climbers found in *Law Kyntang Ka Kruh*

Sl No.	Local Name	Botanical Name	Family
1.	*Soh shangkhlor*	*Elaeagnus pyriformis*	*Elaeagnaceae*
2.	*Soh krot*	*Smilax glabra*	*Smilacaceae*
3.	*Sla kyndajyrmi*	*Pothos scandens*	*Araceae*
4.	*Loapla*	*Rhaphidophora decursiva*	*Araceae*

Table 3.21.5: Bamboos found in *Law Kyntang Ka Kruh*

Sl No.	Local Name	Botanical Name	Family
1.	*Siej skong*	*Bambusa tulda*	*Poaceae*
2.	*Seij iong*	*Chimonobambusa spp*	*Poaceae*

Table 3.21.6: Grasses found in *Law Kyntang Ka Kruh*

Sl No.	Local Name	Botanical Name	Family
1	*Phlang phot*	*Juncus effuses*	*Poaceae*
2	*Phlang traw*	*Imperata cylindrical*	*Poaceae*
3	*Phlang tylli*	*Arundinellakhasiana*	*Poaceae*
4	*Phlang thyrnia*	*Arundinella pumila*	*Poaceae*

Table 3.21.7: Ferns found in *Law Kyntang Ka Kruh*

Sl No.	Local Name	Botanical Name	Family
1	*Tyrkhang nar*	*Lophosoria quadripinnata*	*Dicksoniaceae*
2	*Tyrkhang syieng*	*Adiantum raddianum*	*Pteridaceae*
3	*Tyrkhang khlaw*	*Asplenium nidus*	*Aspleniaceae*

3.21.6.2 Faunal Species

No scientific study to assess presence and abundance of wildlife in *Law Kyntang Ka Kruh* has been carried out so far. However, as per the local residents, presence of some wild animals such as jungle fowls, pangolin, wild boar and various amphibians, reptiles and birds has been reported in this forest.

3.21.7 Growing Stock

As per the methodology described in Chapter-II, enumeration was carried out in 100% area of the forest as its area is more than 2 ha. All trees, having girth (over bark) at breast height more than 30 cm, were enumerated by measuring the top height (in meters) and the girth (in centimetres) at breast

height. Data collected during the enumeration were entered in Sacred Groves Description Form and Plot Enumeration Form. During the enumeration within the grove, data were collected for 48 trees consisting of 11 *Artocarpus integrifolia* (1st dominant), 10 *Cinnamomum tamala* (2nd dominant), 6 *Macaranga denticulata* (3rd dominant), and 21 trees of the rest of species. Using the Local Volume Equations given in Chapter –II, girth class wise volume was calculated for each species for each of the 13 girth classes starting from 30-40 cm to 151 cm and above. Details of the same are given in the Table 3.21.8 below. As may be seen, total growing stock in this forest is 23.54 cubic metres.

Table 3.21.8: Species wise distribution of growing stock in different girth classes in the entire forest *(cum)*

Girth Class (cm)	*Artocarpus integrifolia* (1st dominant)	*Cinnamomum tamala* (2nd dominant)	*Macaranga denticulata* (3rd dominant)	Rest of the species	Total	% of total growing stock
30-40	0.00	0.00	0.00	0.03	**0.03**	0.13
41-50	0.36	0.00	0.11	0.16	**0.63**	2.68
51-60	0.31	0.31	0.45	0.84	**1.91**	8.11
61-70	1.10	0.00	0.45	2.30	**3.85**	16.36
71-80	0.58	0.48	0.00	3.65	**4.71**	20.01
81-90	0.78	0.76	0.00	0.74	**2.28**	9.69
91-100	2.85	0.57	0.00	0.89	**4.31**	18.31
101-110	0.00	0.00	0.00	0.00	**0.00**	0.00
111-120	0.00	1.05	0.00	0.00	**1.05**	4.46
121-130	0.00	0.00	0.00	0.00	**0.00**	0.00
131-140	0.00	1.54	0.00	0.00	**1.54**	6.54
141-150	0.00	0.00	0.00	0.00	**0.00**	0.00
151 & above	0.00	0.00	0.00	3.23	**3.23**	13.72
Total	**5.98**	**4.71**	**1.01**	**11.84**	**23.54**	100.00
% of total growing stock	**25.40**	**20.01**	**4.29**	**50.30**	**100.00**	

As may be seen, 25.40%, the total growing stock is contributed by the 1st dominant species (*Artocarpus integrifolia)*. The 2nd dominant species (*Cinnamomum tamala*) constitutes 20.01% of the total growing stock. Similarly, the 3rd dominant species *(Macaranga denticulata)* constitutes 4.29 % of the total growing stock. A significant part of the growing stock (*i.e.* 50.30 %) is constituted by the rest of the species.

Figure 3.21.1:Girth class-wise distribution of growing stock

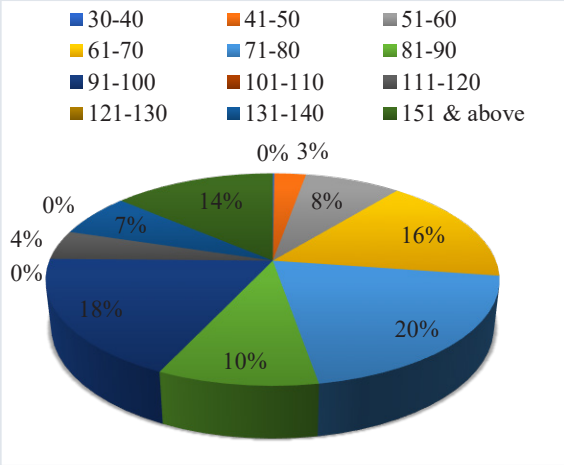


Figure 3.21.2: Species-wise distribution of growing stock

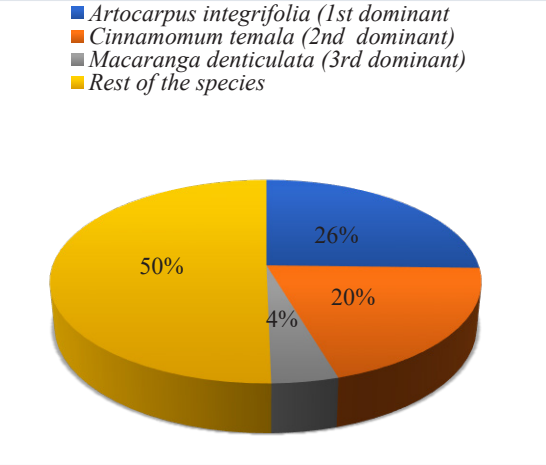


Figure 3.21.3:Girth class-wise distribution of growing stock

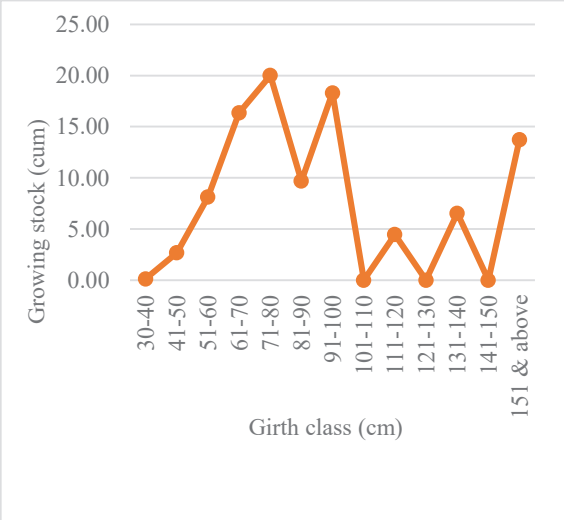


Figure 3.21.4: Overview of *Law Kyntang Ka Kruh*



3.21.8 Number of Stems

Species-wise number of stems in each girth class are given in Table 3.21.9 below. As may be seen maximum numbers of stems are found in mid girth classes *i.e.* from 51-60 cm to 71-80 cm. This indicates poor regeneration of tree species.

Table 3.21.9: Species-wise distribution of stems in different girth classes in the entire forest

(numbers of stems)

Girth Class (cm)	*Artocarpus integrifolia* (1st dominant)	*Cinnamomum tamala* (2nd dominant)	*Macaranga denticulata* (3rd dominant)	Rest of the species	Total
30-40	0	0	0	1	1
41-50	2	0	1	1	4
51-60	1	3	3	3	10
61-70	3	0	2	6	11
71-80	1	2	0	7	10
81-90	1	2	0	1	4
91-100	3	1	0	1	5
101-110	0	0	0	0	0
111-120	0	1	0	0	1
121-130	0	0	0	0	0
131-140	0	1	0	0	1
141-150	0	0	0	0	0
151 & above	0	0	0	1	1
Total	**11**	**10**	**6**	**21**	**48**

Figure 3.21.5: Number of stems in different girth classes

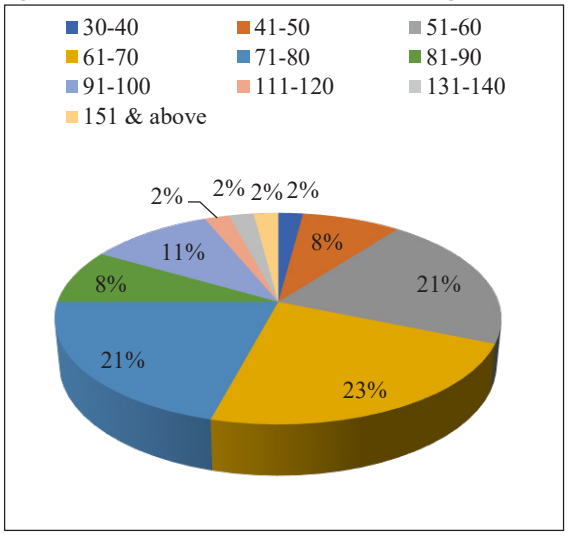


Figure 3.21.6: species-wise distribution of stems

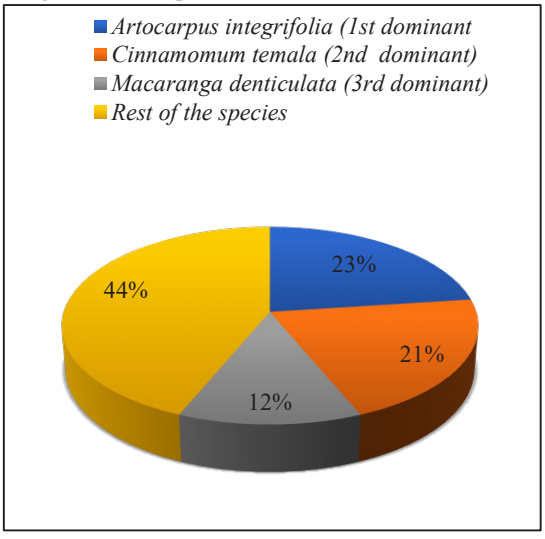


Figure 3.21.7:Number of stems in different girth classes

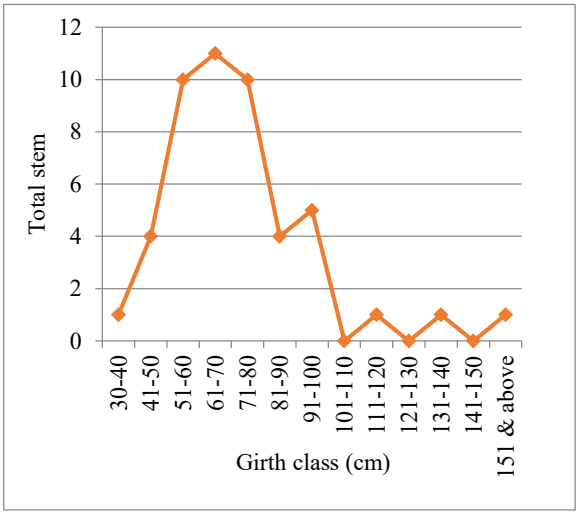
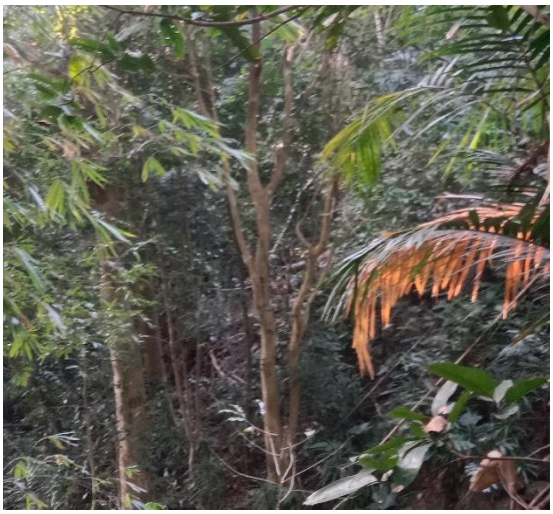


Figure 3.21.4: In side view of *Law Kyntang Ka Kruh*



3.21.9 Prescriptions for Future Management

3.21.9.1 Registration with the Khasi Hills Autonomous District Council

The United Khasi-Jaintia Hills Autonomous District (Management and Control of Forests) Rules, 1960 provides for registration of each *Law Adong/Law Kyntang* located in areas falling under jurisdiction of the Khasi Hills Autonomous District Council (KHADC). Though these rules came into force about 65 years ago, the *Law Kyntang Ka Kruh* has not been registered with the KHADC. The Chief Forest Officer of the KHADC and the clan representative of the *Law Kyntang* may take immediate necessary actions, as provided in Chapter-I of the said rules to register the *Law Kyntang Ka Kruh* with the KHADC. The same will accord legal recognition and protection from diversion for non-forestry purposes.

3.21.9.2 Notification as Community Reserve

Section 38C of the Wild Life (Protection) Act, 1972 provides that the State Government may, where the community or an individual has volunteered to conserve wild life and its habitat, declare any private or community land not comprised within a National Park, Wildlife Sanctuary or a Conservation Reserve, as a Community Reserve, for protecting fauna, flora and traditional or cultural conservation values and practices. Notification of an area as a Community Reserve accords it legal protection. It will make it eligible to receive financial assistance under a Centrally Sponsored Scheme of 'Integrated Development of Wildlife Habitats'. The Clan representative of *Law Kyntang Ka Kruh* and Wildlife Wing in the Forest and Environment Department, Government of Meghalaya may therefore take necessary actions for notification of the *Law Kyntang Ka Kruh* as a Community Reserve.

3.21.9.3 Boundary Demarcation

Boundary of the *Law Kyntang Ka Kruh* has not been physically demarcated on the ground. The grove is bounded in all four sides by private land. To prevent and to ensure early detection of encroachments, the boundary of the *Law Kyntang Ka Kruh* wherever, it is not constituted by nature features of permanent nature may be demarcated by erection of RCC boundary pillars and painting of rings on stem of trees standing on the boundary.

3.21.9.4 Fire Protection

As per the Meghalaya Forest Fire Information System developed by the North Eastern Space Application Centre (NESAC) no fire incident has occurred in the *Law Kyntang Ka Kruh* during a period of 22 years from 2002 to 2024**.** As per the said System a major part of the *Law Kyntang Ka Kruh* is moderately to highly vulnerable for forest fires. Similarly, as per the said information system, a major part of *Law Kyntang Ka Kruh* is not prone to forest fire. To prevent damage to the *Law Kyntang Ka Kruh* from accidental forest fires, measures such as creation and periodic cleaning of fire line along the periphery and at critical locations within the *Law Kyntang Ka Kruh* and engagement of fire watchers during the critical months may be taken.

3.21.9.5 Construction of Soil Moisture Conservation and Water Harvesting Structures

No perennial stream flows in the *Law Kyntang Ka Kruh*. To prevent and minimise soil erosion and to improve moisture regime, water harvesting structure such as of check dam, contour trench, *etc*. may be constructed at suitable locations in the *Law Kyntang Ka Kruh.*

3.21.9.6 Creation of Eco-Tourism Facilities

To create awareness about rich biodiversity of the *Law Kyntang Ka Kruh* and also to create livelihood opportunities for local residents, eco-tourism facilities such as rain shelter cum view point, footpath/ walking trail, sign board, washrooms *etc.* may be provided to attract visitors.

3.21.9.7 Restocking of Degraded Areas

Efforts may be made to restock *Law Kyntang Ka Kruh* by assisting and promoting natural regeneration of native species. Areas which cannot be restocked by natural regeneration alone, may be afforersted by planting seedlings of native species.

3.21.9.8 Formulation of A Proposal and Registration Thereof on Carbon Registry to Earn Carbon Credits

To reward local communities for their efforts in conservation and protection of *Law Kyntang Ka Kruh* for centuries, a proposal may be formulated and registered on an appropriate carbon registry to earn carbon credits for measures to be taken by the local communities for better protection and conservation of the *Law Kyntang Ka Kruh.*

3.21.9.9 Awareness Campaign

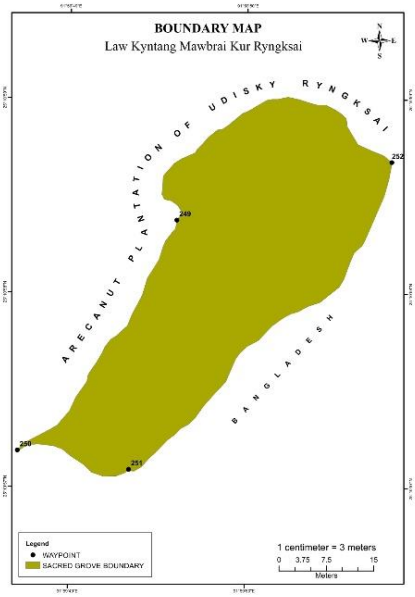
The *Law Kyntang Ka Kruh* has been protected by the ancestors of the clan for centuries for spiritual, ecological and cultural beliefs. With gradual subordination of these beliefs, the clan concern

for conservation and protection of sacred groves and other community owned forests is gradually eroding. The same therefore need to be revived and strengthened by creating awareness among the clan and local communities and grass root level institutions about cultural, heritage and economic importance of sacred groves and other community owned forests.

3.22. *LAW KYNTANG MAWBRAI*

3.22.1 Location

Law Kyntang Mawbrai is located in East Khasi Hills District of Meghalaya along Indo-Bangla international border at *Umkrem* village under *Hima Khyrim* Syiemship. It covers an area of 0.146 ha and lies between 25° 10.57" to 25° 10.59″ N latitude and 91° 59′ 49″ to 91° 59′ 50″ E Longitude at an altitude of 38 m above mean sea level. It is bounded in the North-West by Arecanut plantation of one Udisky Ryngksai and in the South-East by Bangladesh. It is accessible from Shillong by Shillong –*Pynursla* Highway. It is about 81 km away from Shillong via *Pynursla* road.





3.22.2 Brief History

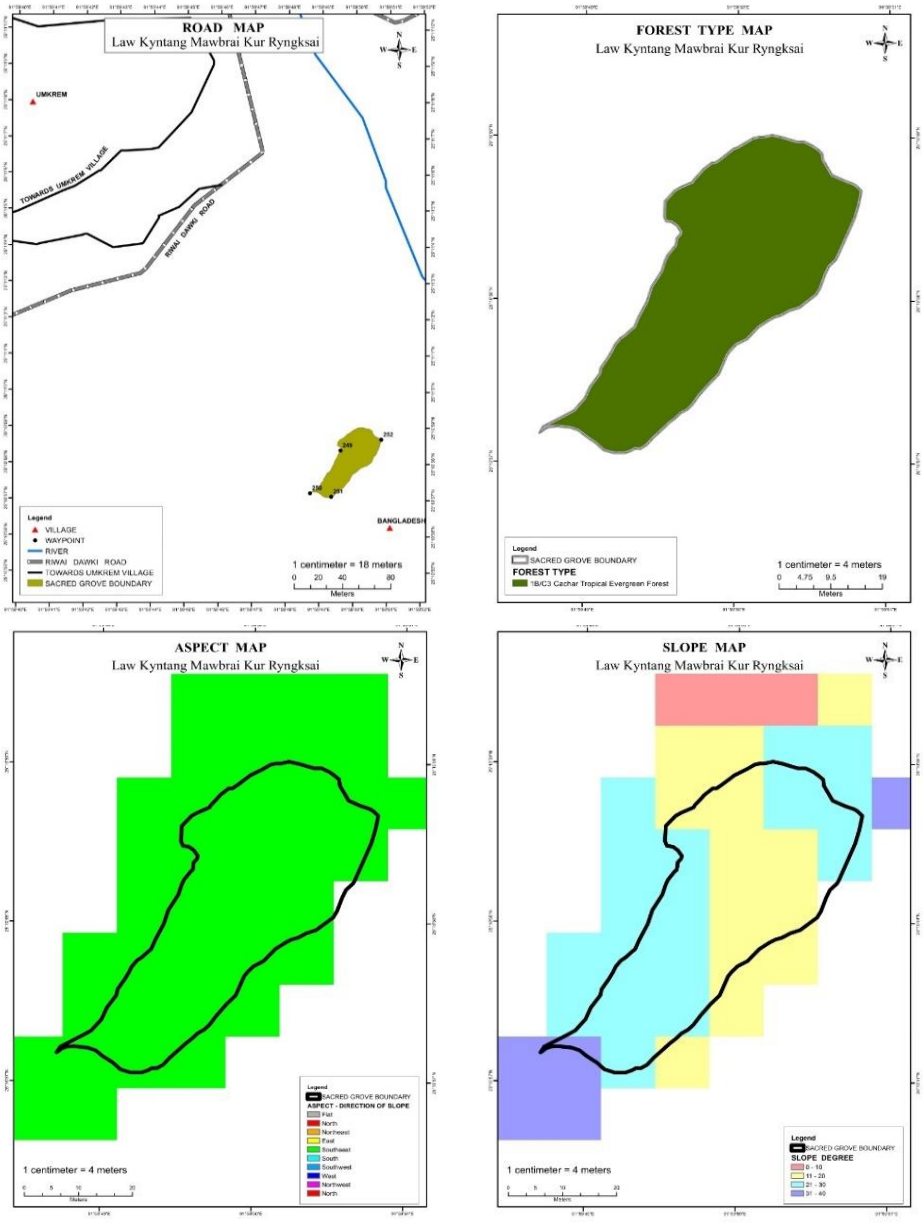
Law Kyntang Mawbrai has been in existence for several centuries. The religious significant of the grove has declined over the years. In the past religious rituals were perform in this grove and the forest was protected for spiritual needs of the *Kur* (Clan). Currently such rituals are not performed in this forest. However, the *Kur* (Clan) still revere this forest in remembrance of their ancestors and for its ecological value. The grove is administered and managed by the *Kur* (Clan) elders. Green felling of trees is strictly prohibited by the clan. Biotic pressures such as encroachment, hunting, poaching and illegal felling of trees are absent in this forest.

3.22.3 Geography and Climate

Topography of the *Law Kyntang Mawbrai* is undulating in nature with slope varying from 0.15° to 30°. The the *Law Kyntang Mawbrai* falls under the South-East aspect. Soil texture is sandy with no coarse

fragments. Soil consistency is slightly compact. The soil is brown in colour and shallow in depth. Stoniness is moderate in this grove. Moderate soil erosion has been observed in this forest.

Winter season starts from October end and lasts till February of the next year. It receives high rainfall during the monsoon season from April to September end. The average temperature varies from 10° C to 32° C.



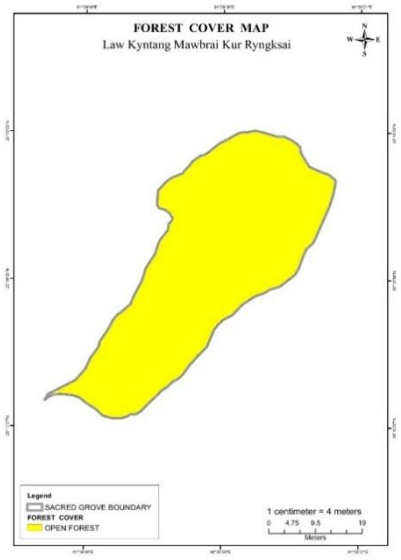
3.22.4 Forest Type

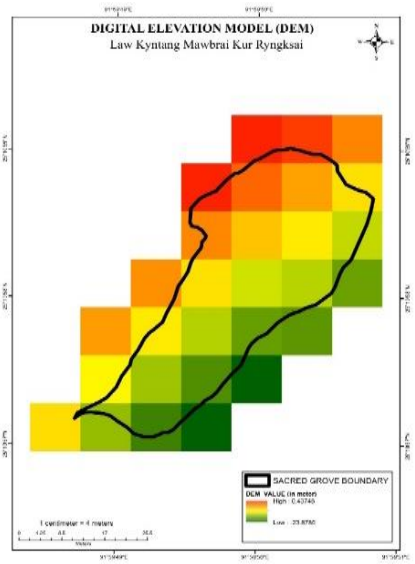
As per the Champion and Seth classification (1968), forests found in the sacred grove are of the ***Type 1B/C3 Cachar Tropical Evergreen Forest.***

3.22.5 Forest Cover

As per the India State of Forest Report-2021 published by the Forest Survey of India, Dehradun, forest cover in the *Law Kyntang Mawbrai* is as below:

Forest Cover	**Area (ha.)**	**% of total Area**
Very Dense Forest (> 70%)	0	0
Moderately Dense Forest (40 %-70 %)	0	0
Open Forest (10% - 40%)	0.15	100.00
Scrub Forest (<10%)	0	0
Non-Forest	0	0
Total	**0.15**	**100**





3.22.6 Flora and Fauna

The *Law Kyntang Mawbrai* is home to degraded open forest of natural origin. *Symplocos chinenisis* and *Bauhinia variegata* are respectively 1st and 2nd dominant tree species. Some rare, endangered and endemic plant species are naturally present in this forest.

3.22.6.1: Floral species

Table 3.22.1: Trees found in *Law Kyntang Mawbrai*

Sl. No.	Local Name	Botanical Name	Family
1.	*Dieng lymbaw*	*Annona reticulate*	*Annonaceae*
2.	*Dieng sohshram*	*Artocarpus lacucha*	*Moraceae*
3.	*Dieng jalong*	*Bauhinia variegata*	*Fabaceae*
4.	*Dieng lakhiat*	*Callicarpa arborea*	*Verbanaceae*
5.	*Dieng tlai*	*Caryota urens*	*Arecaceae*
6.	*Dieng syriah (langmoh)*	*Castanopis armata*	*Fagaceae*
7.	*Dieng sning*	*Castanopsis tribuloides*	*Fagaceae*
8.	*Dieng sohliwa*	*Eugenia aquea*	*Myrtaceae*
9.	*Dieng sohpyrsit*	*Eurya accuminata*	*Theaceae*
10.	*Dieng sohlapong*	*Ficus spp*	*Moraceae*
11.	*Dieng khwang (Sohkwang)*	*Garcinia spicata*	*Clusiaceae*
12.	*Dieng sohiong*	*Mahomia acanthifolia*	*Berberidaceae*
13.	*Dieng sohpdem*	*Persea patiolaris*	*Lauraceae*
14.	*Dieng sohjadaw (fanai)*	*Pierasma javanica*	*Simaroubaceae*
15.	*Dieng klong (tlong)*	*Pyrularia edulis*	*Santalaceae*
16.	*Dieng kain*	*Rhus succedanea*	*Anacardiaceae*
17.	*Dieng sir*	*Stereospermum chelonoides*	*Bignoniaceae*
18.	*Dieng iong*	*Symplocos chinenisis*	*Symplocaceae*

Table 3.22.2: Shrubs found in *Law Kyntang Mawbrai*

Sl No.	Local Name	Botanical Name	Family
1.	*Jakhain*	*Hypochaeris radicata*	*Asteraceae*
2.	*Jathynrait*	*Cynometra ramiflora*	*Fabaceae*
3.	*Dieng niangmat*	*Mahonia pycnophylla*	*Berberidaceae*
4.	*Jakhi*	*Moutia puya*	*Bromeliaceae*
5.	*kdait*	*Polygonum spp*	*Polygonaceae*

Table 3.22.3: Herbs found in *Law Kyntang Mawbrai*

Sl No.	Local Name	Botanical Name	Family
1.	*Synrai khlaw*	*Alpinia spp.*	*Gingiberaceae*
2.	*Tiew die*	*Bulbophyllum cylindraceum*	*Orchidaceae*
3.	*Tyrkhang khlaw*	*Asplenium nidus*	*Aspleniaceae*

4.	*Lashing*	*Curcuma aromatica*	*Zingiberaceae*
5.	*Synsar*	*Thysanolaena maxima*	*Poaceae*
6.	*Wang um*	*Homalomena aromatica*	*Araceae*
7.	*Langprut*	*Juncus effusus*	*Juncaceae*
8.	*Wang khlaw*	*Colocasia Esculenta*	*Araceae*
9.	*Lakut*	*Curculigo orchioides*	*Hypoxidaceae*
10.	*Jarem*	*Clerodendrum*	*Verbenacea*

Table 3.22.4: Climbers found in *Law Kyntang Mawbrai*

Sl No.	Local Name	Botanical Name	Family
1.	*Jermi soh masem*	*Paederia foetida*	*Rubiaceae*
2.	*Jermi lieh*	*Clematis buchananiana*	*Ranunculaceae*
3.	*Jermi saw*	*Pouzolzia hirta*	*Urticaceae*
4.	*Mei sia*	*Paederia foetida*	*Rubiaceae*

Table 3.22.5: Bamboos found in *Law Kyntang Mawbrai*

Sl No.	Local Name	Botanical Name	Family
1.	*Siej skong*	*Bambusa tulda*	*Poaceae*
2.	*Kdait namlang*	*Chimonabambusa khasiana*	*Poaceae*

Table 3.22.6: Grass found in *Law Kyntang Mawbrai*

Sl No.	Local Name	Botanical Name	Family
1.	*Lang symphut*	*Juncus effusus*	*Juncaceae*
2.	*Phlang san*	*Kaempferia rotunda*	*Zingiberaceae*
3.	*Khaw iong*	*Cautleya spicata*	*Zingiberaceae*
4.	*Phlang saw*	*Alpinia zalang*	*Zingiberaceae*
5.	*Phlang sir*	*Corex speculata*	*Cyperaceae*

3.22.6.2 Faunal Species

No scientific study to assess presence and abundance of wildlife in *Law Kyntang Mawbrai* has been carried out so far. However, as per the local residents, presence of some wild animals of amphibians, reptile, bird and mammal classes has reported in this forest.

3.22.7 Growing Stock

As per the methodology described in Chapter-II, enumeration was carried out in 100% area of the forest as its area is less than 2 ha. All the trees, having girth (over bark) at breast height more than 30 cm were enumerated by measuring the top height (in meters) and the girth (in centimetres) at breast height. Data collected during the enumeration were entered in Sacred Groves Description Form and Plot Enumeration Form. During the enumeration within the grove, data were collected for 45 trees consisting of 9 *Symplocos chinenisis* (1st dominant), 7 *Bauhinia variegata* (2nd dominant), 5 *Eugenia aquea* (3rd dominant), and 24 trees of rest of the species. Using the Local Volume Equations given in Chapter –II, girth class wise volume was calculated for each species for each of the 13 girth classes starting from 30-40 cm to 151 cm and above. Details of the same are given in the Table 3.22.6 below. As may be seen, total growing stock in this forest is 41.56 cubic metres.

Table 3.22.6: Species wise distribution of growing stock in different girth classes in the entire forest

(cum)

Girth Class (cm)	*Symplocos chinenisis* (1st dominant)	*Bauhinia variegata* (2nd dominant)	*Eugenia aquea* (3rd dominant)	Rest of the species	Total	% of total growing stock
30-40	0.00	0.00	0.00	0.04	**0.04**	0.10
41-50	0.00	0.00	0.00	0.47	**0.47**	1.13
51-60	0.42	0.78	0.00	0.56	**1.76**	4.23
61-70	0.87	0.78	0.43	0.84	**2.92**	7.03
71-80	0.96	0.48	0.00	3.15	**4.59**	11.04
81-90	0.00	0.79	0.00	1.44	**2.23**	5.37
91-100	0.87	0.00	0.00	1.71	**2.58**	6.21
101-110	0.00	0.00	1.09	5.95	**7.04**	16.94
111-120	2.95	0.00	0.00	1.48	**4.43**	10.66
121-130	0.00	0.00	0.00	0.00	**0.00**	0.00
131-140	0.00	0.00	2.04	0.00	**2.04**	4.91
141-150	0.00	0.00	2.19	0.00	**2.19**	5.27
151 & above	0.00	0.00	11.27	0.00	**11.27**	27.12
Total	**6.07**	**2.83**	**17.02**	**15.64**	**41.56**	100.00
% of total growing stock	**14.61**	**6.81**	**40.95**	**37.63**	**100.00**	

As may be seen, 14.61%, the total growing stock is contributed by the 1st dominant species (*Symplocos chinenisis)*. The 2nd dominant species (*Bauhinia variegata*) constitutes 6.81 % of the total growing stock as this is a small-sized tree. Similarly, the 3rd dominant species *(Eugenia aquea)* constitutes a major part (40.95 %) of the total growing stock. The remaining growing stock (*i.e.* 37.63 %) is constituted by the rest of the species.

Figure 3.22.1:Girth class-wise distribution of growing stock

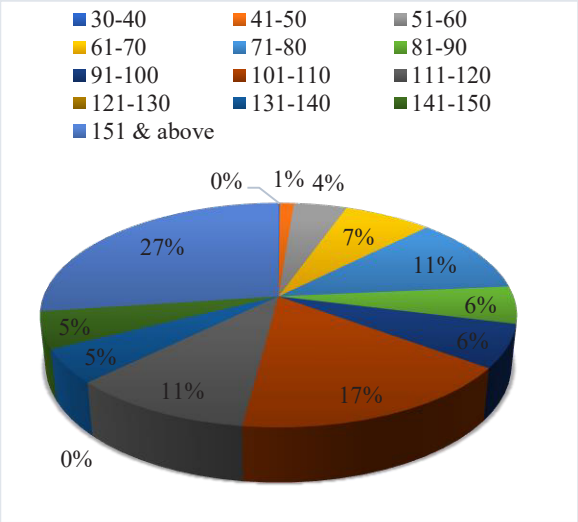


Figure 3.22.2: Species-wise distribution of growing stock

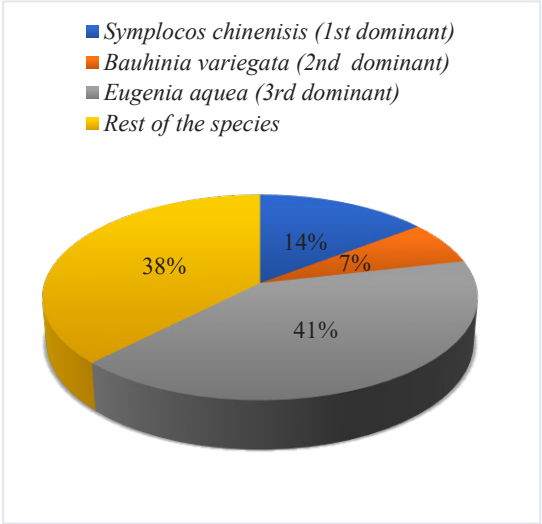


Figure 3.22.3:Girth class-wise distribution of growing stock

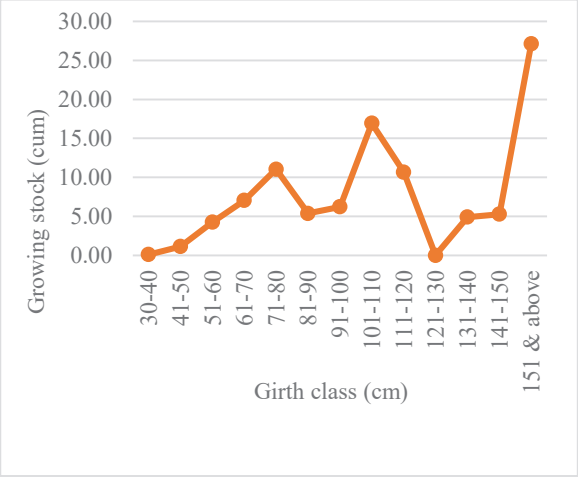


Figure 3.22.4: Overview of *Law Kyntang Mawbrai*



3.22.8 Number of Stems

Species-wise number of stems in each girth class are given in Table 3.22.7 below. As may be seen maximum numbers of stems are found in middle girth classes *i.e.* from 51-60 cm to 71-80 cm. This shows 'poor' status of regeneration.

Table 3.22.7: Species-wise distribution of stems in different girth classes in the entire forest

(numbers of stems)

Girth Class (cm)	*Symplocos chinenisis* (1st dominant)	*Bauhinia variegata* (2nd dominant)	*Eugenia aquea* (3rd dominant)	Rest of the species	Total
30-40	0	0	0	1	1
41-50	0	0	0	3	3
51-60	2	3	0	2	7
61-70	2	2	1	2	7
71-80	2	1	0	6	9
81-90	0	1	0	2	3
91-100	1	0	0	2	3
101-110	0	0	1	5	6
111-120	2	0	0	1	3
121-130	0	0	0	0	0
131-140	0	0	1	0	1
141-150	0	0	1	0	1
151 & above	0	0	1	0	1
Total	**9**	**7**	**5**	**24**	**45**

Figure 3.22.5: Number of stems in different girth classes

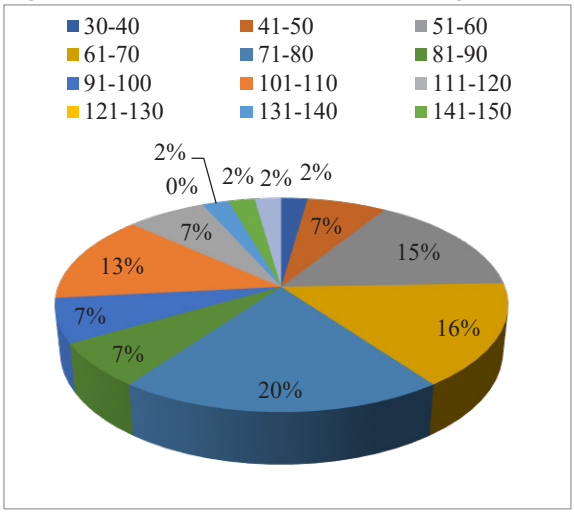


Figure 3.22.6: Species-wise distribution of stems

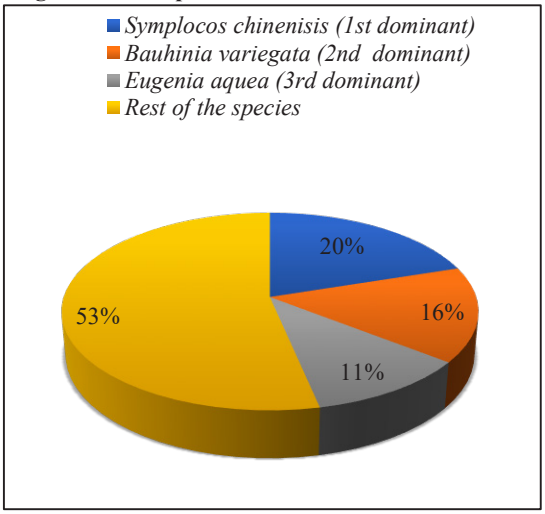


Figure 3.22.7:Number of stems in different girth classes

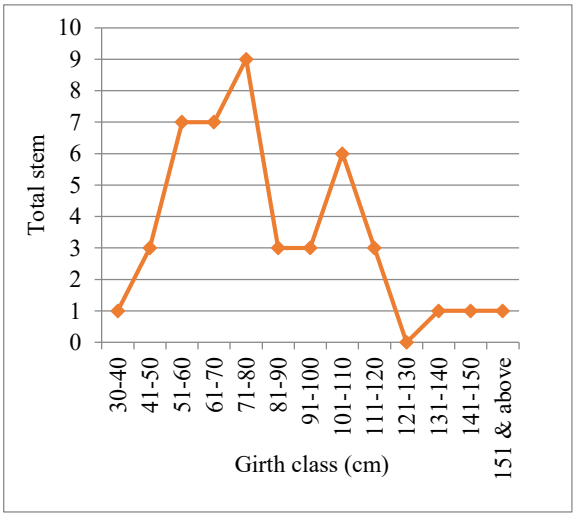


Figure 3.22.8: In side view of *Law Kyntang Mawbrai*



3.22.9 Prescriptions for Future Management

3.22.9.1 Registration with the Khasi Hills Autonomous District Council

The United Khasi-Jaintia Hills Autonomous District (Management and Control of Forests) Rules, 1960 provides for registration of each *Law Adong/Law Kyntang* located in areas falling under jurisdiction of the Khasi Hills Autonomous District Council (KHADC). Though these rules came into force about 65 years ago, the *Law Kyntang Mawbrai* has not been registered with the KHADC. The Chief Forest Officer of the KHADC and the clan representative of the *Law Kyntang* may take immediate necessary actions, as provided in Chapter-I of the said rules to register the *Law Kyntang Mawbrai* with the KHADC. The same will accord legal recognition and protection from diversion for non-forestry purposes.

3.22.9.2 Notification as Community Reserve

Section 38C of the Wild Life (Protection) Act, 1972 provides that the State Government may, where the community or an individual has volunteered to conserve wild life and its habitat, declare any private or community land not comprised within a National Park, Wildlife Sanctuary or a Conservation Reserve, as a Community Reserve, for protecting fauna, flora and traditional or cultural conservation values and practices. Notification of an area as a Community Reserve accords it legal protection. It will also make it eligible to receive financial assistance under a Centrally Sponsored Scheme of 'Integrated Development of Wildlife Habitats'. The clan representative of *Law Kyntang Mawbrai* and Wildlife Wing in the Forest and Environment Department, Government of Meghalaya may therefore take necessary actions for notification of the *Law Kyntang Mawbrai* as a Community Reserve.

3.22.9.3 Boundary Demarcation

Boundary of the *Law Kyntang Mawbrai* has not been physically demarcated on the ground. The grove is bounded by private land along its North-West boundary. To prevent and to ensure early detection of encroachment, the boundary of *Law Kyntang Mawbrai* may be demarcated by erection of RCC boundary pillars and painting of rings on stem of trees standing along the North-West boundary.

3.22.9.4 Fire Protection

As per the Meghalaya Forest Fire Information System developed by the North Eastern Space Application Centre (NESAC) no fire incident has occurred in the *Law Kyntang Mawbrai* during a period of last 22 years from 2002 to 2024) As per the said Information System a major part of the *Law Kyntang Mawbrai* is not vulnerable to forest fires. As per the said information system, a major part of *Law Kyntang Mawbrai* is not prone to forest fires. However, to prevent damage to the *Law Kyntang Mawbrai* from accidental forest fires, measures such as creation and periodic cleaning of fire line along the periphery and at critical locations within the *Law Kyntang Mawbrai* and engagement of fire watchers during the critical months may be taken.

3.22.9.5 Construction of Soil Moisture Conservation and Water Harvesting Structures

No perennial stream flows in the *Law Kyntang Mawbrai*. To prevent and minimise soil erosion and to improve moisture regime, water harvesting structure such as of check dam, contour trench, *etc*. May be constructed at suitable locations in the *Law Kyntang Mawbrai.*

3.22.9.6 Creation of Eco-Tourism Facilities

To create awareness about rich biodiversity of the *Law Kyntang Mawbrai and* also to create livelihood opportunities for local residents, eco-tourism facilities such as rain shelter cum view point, footpath, walking trail, sign board, washroom *etc.* may be provided to attract visitors.

3.22.9.7 Restocking of Degraded Areas

Efforts may be made to restock the degraded patches in *Law Kyntang Mawbrai* by assisting and promoting natural regeneration of native species. Areas which cannot be restocked by natural regeneration alone may be regenerated by planting seedlings of native species.

3.22.9.8 Formulation of A Proposal and Registration Thereof on Carbon Registry to Earn Carbon Credits

To reward the local communities for their efforts in conservation and protection of *Law Kyntang Mawbrai* for centuries, a proposal may be formulated and registered on an appropriate carbon registry to earn carbon credits for measures to be taken by the local communities for better protection and conservation of the *Law Kyntang Mawbrai.*

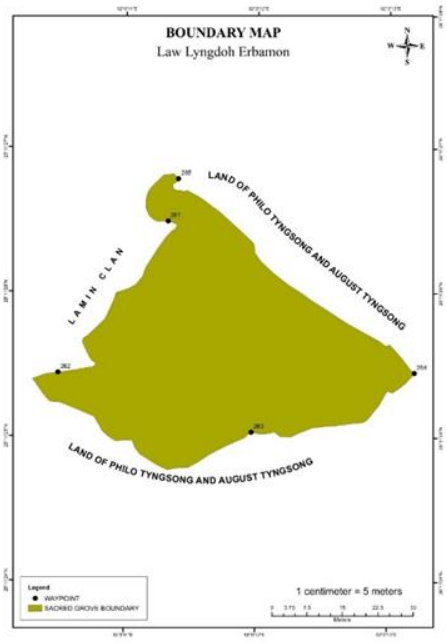
3.22.9.9 Awareness Campaign

The *Law Kyntang Mawbrai* has been protected by the ancestors of the clan for centuries for spiritual, ecological and cultural beliefs. With gradual subordination of these beliefs, the clan's concern for conservation and protection of sacred groves and other community owned forests is gradually eroding. The same therefore needs to be revived and strengthened by creating awareness among the members of the clan, local communities and grass root level institutions about cultural, ecological and economic importance of sacred groves and other community owned forests.

3.23. *LAW LYNGDOH ERBAMON*

3.23.1 Location

Law Lyngdoh Erbamon is located in East Khasi Hills District of Meghalaya at *Erbamon* village under *Hima Khyrim* Syiemship. It covers an area of 0.24 ha and lies between 25° 11.24" to 25° 11.27″ N latitude and 92° 0′ 11″ to 92° 0′ 14″ E longitude at an altitude of 127 m above mean sea level. It is bounded in the North-East and South by land of Philo Tynsong and August Tynsong and in North-West by land of *Lamin* clan. It is accessible from Shillong by Shillong Pynursla Highway. It is at a distance of about 80 Kms from Shillong.

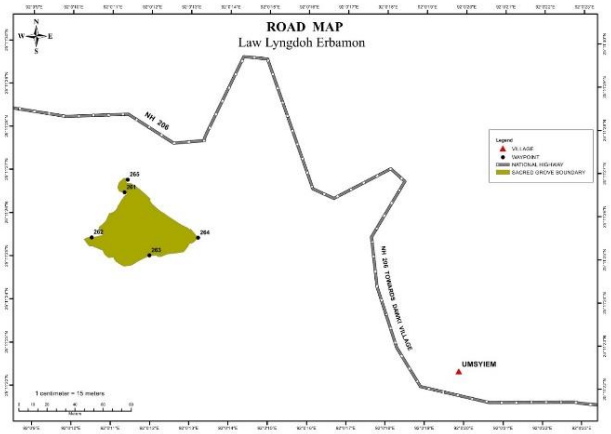


3.23.2 Brief History



Law Lyngdoh Erbamon has been in existence for several centuries. The grove is managed and administered by the clan. In the past religious rituals were performed in this grove. However, currently such religious rituals are no longer performed in this grove. The clan still revere this forest in remembrance of their ancestors and for its ecological value. Green felling of trees is strictly prohibited by the clan.

Biotic pressures such as encroachment, hunting, poaching and illegal felling of trees are absent in this forest.

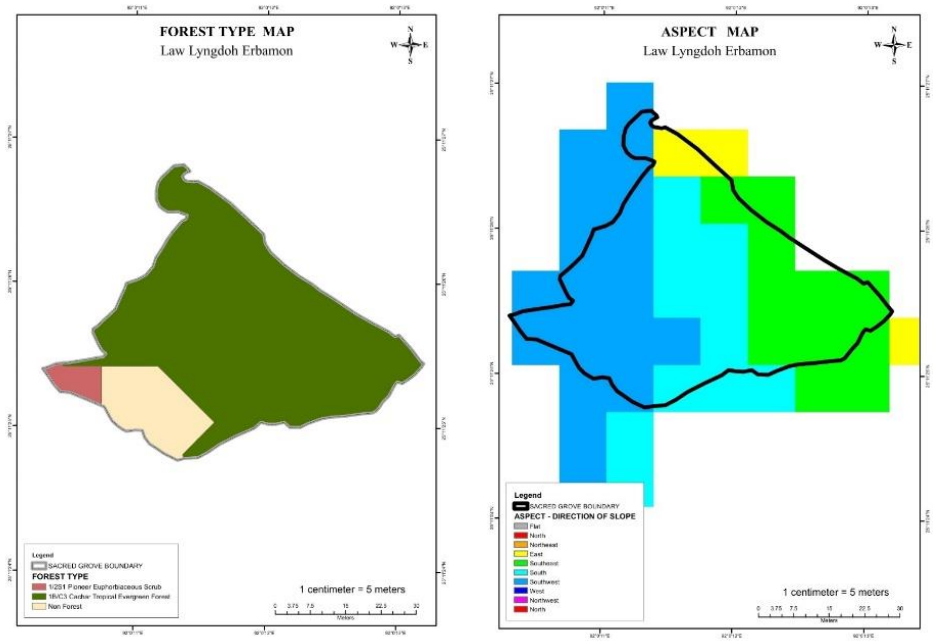


3.23.3 Geography and Climate

Topography of the *Law Lyngdoh Erbamon* is gentle rolling in nature with slope varying from 0.2° to 10°. Major part of the *Law Lyngdoh Erbamon* falls under the South-East and South-West aspects. Small area of this forest falls under the Southern aspect. Soil texture is sandy with no coarse

fragments. Soil consistency is slightly compact. The soil is brown in colour and the soil depth is shallow. Stoniness is moderate in this grove. There are no signs of soil erosion.

Winter season starts from the October end and lasts till February of the next year. It receives high rainfall during the monsoon season from April to September end. The average temperature varies from 8°C to 32°C.



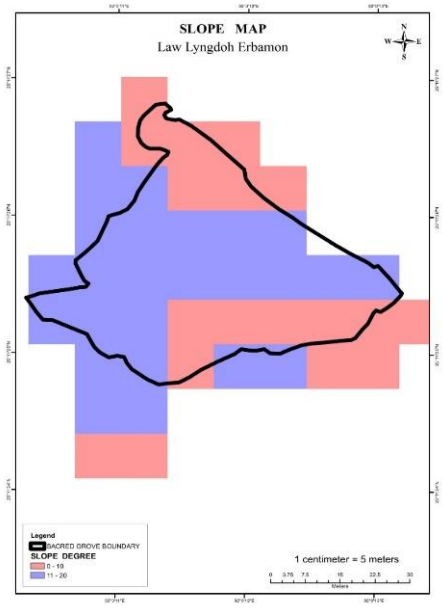
3.23.4 Forest Type

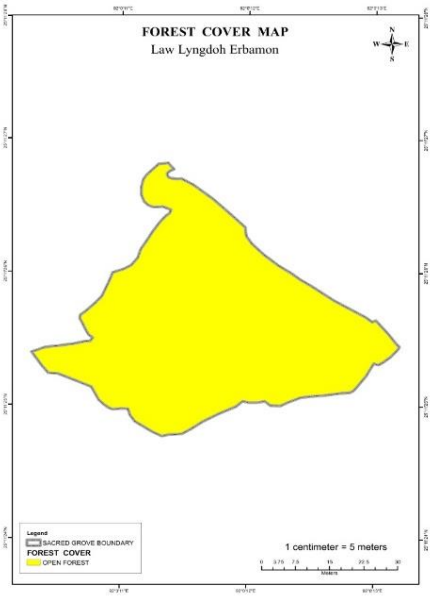
As per the Champion and Seth classification (1968), forests found in the sacred grove are of the ***Type 1B/C3 Cachar Tropical Evergreen Forest*** and ***1/2S1 Pioneer Euphorbiaceous Scrub.***

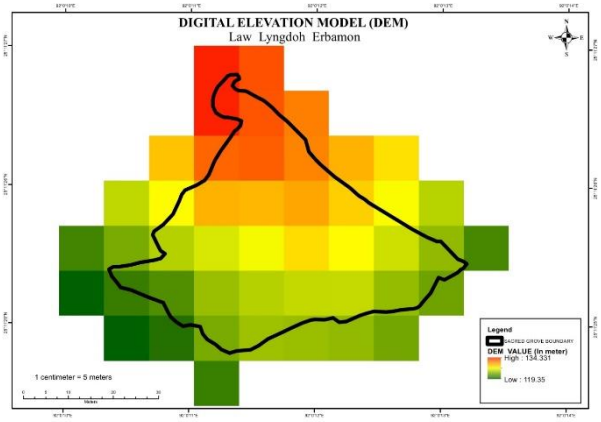
3.23.5 Forest Cover

As per the India State of Forest Report-2021 published by the Forest Survey of India, Dehradun, forest cover in the *Law Lyngdoh Erbamon* is as below:

Forest Cover	**Area (ha.)**	**% of total Area**
Very Dense Forest (> 70%)	0	0
Moderately Dense Forest (40 %-70 %)	0	0
Open Forest (10% - 40%)	0.24	100
Scrub Forest (<10%)	0	0
Non-Forest	0	0
Total	**0.24**	**100**







3.23.6 Flora and Fauna

The *Law Lyngdoh Ebamon* is home to open degraded forest of natural origin. *Toona ciliata* and *Ficus cunia* are respectively 1st and 2nd dominant tree species. The forest is home to many rare, endangered and endemic plant species.

3.23.6.1 Floral species

Table 3.23.1: Trees found in *Law Lyngdoh Erbamon*

Sl. No.	Local Name	Botanical Name	Family
1.	*Dieng sohphan*	*Artocarpus integrifolia*	*Moraceae*
2.	*Dieng jalong*	*Bauhinia variegata*	*Fabaceae*
3.	*Dieng lieng*	*Betula alnoides*	*Betulaceae*
4.	*Dieng song*	*Erythrina indica*	*Fabaceae*
5.	*Dieng sohryngkoh*	*Fagraea ceilamica*	*Gentianaceae*

6.	*Dieng slaskuin(thylliang)*	*Ficus cunia*	*Moraceae*
7.	*Dieng jri*	*Ficus spp*	*Moraceae*
8.	*Dieng er/ther*	*Lagerstromia spiciosa*	*Lythraceae*
9.	*Dieng lakhar*	*Macaranga denticulata*	*Euphorbiaceae*
10.	*Dieng rai*	*Michelia champaca*	*Magnoliaceae*
11.	*Dieng sohskei*	*Quercus spp*	*Fagaceae*
12.	*Dieng kain*	*Rhus succedanea*	*Anacardiaceae*
13.	*Dieng iong*	*Symplocos paniculata*	*Symplocaceae*
14.	*Dieng Bti*	*Toona ciliata*	*Meliaceae*
15.	*Dieng langta*	*Trema orientalis*	*Cannabaceae*
16.	*Dieng ngai*	*Mesua ferrea*	*Calophyllaceae*

Table 3.23.2: Shrubs found in *Law Lyngdoh Erbamon*

Sl No.	Local Name	Botanical Name	Family
1.	*Dieng sohlaper*	*Pinanga gracilis*	*Arecaceae*
2.	*Dieng jathynroit*	*Cynometra ramiflora*	*Fagaceae*
3.	*Dieng tyrnem*	*Camelia caudula*	*Fagaceae*
4.	*Dieng lari-ria*	*Cinnamomum spp*	*Lauraceae*

Table 3.23.3: Herbs found in *Law Lyngdoh Erbamon*

Sl No.	Local Name	Botanical Name	Family
1.	*Dieng rnong*	*Mahonia pycnophylla*	*Berberidaceae*
2.	*Slamet*	*Phrynium spp*	*Pubinevve*
3.	*Bat refugi*	*Mikania micrantha*	*Asteraceae*
4.	*Lapadong*	*Hiptage benghalensis*	*Malpighiaceae*
5.	*Tympew shiah*	*Hedera nepalensis*	*Araliaceae*
6.	*Jajew maw*	*Begonia spp.*	*Begoniaceae*

Table 3.23.4: Climbers found in *Law Lyngdoh Erbamon*

Sl No.	Local Name	Botanical Name	Family
1.	*Bat refugi*	*Mikania micrantha*	*Asteraceae*
2.	*Jermi lapadong*	*Monochoria vaginalis*	*Pontederiaceae*
3.	*Tympew shiah*	*Hedera nepalensis*	*Araliaceae*
4.	*Jermi sohlah*	*Gynura bicolor*	*Asteraceae*
5.	*Jermi ruin*	*Derris elliptica*	*Fabaceae*
6.	*Jermi shiah*	*Zanthoxylum khasianum*	*Rutaceae*

Table 3.23.5: Bamboos found in *Law Lyngdoh Erbamon*

Sl No.	Local Name	Botanical Name	Family
1.	*Siej sylli*	*Melocanna baccifera*	*Poaceae*
2.	*Seij khlaw*	*Bambusa khasiana*	*Poaceae*
3.	*Seij sken*	*Bambusa pallida*	*Poaceae*
4.	*Seij Rugai*	*Bambusa tulda*	*Poaceae*

Table 3.23.6: Ferns found in *Law Lyngdoh Erbamon*

Sl No.	Local Name	Botanical Name	Family
1.	*Thyrkhang maw*	*Cyathea gigantea*	*Cyatheaceae*
2.	*Tyrkhang khlaw*	*Asplenium nidus*	*Aspleniaceae*
3.	*Tyrkhang iong*	*Adiantum raddianum*	*Pteridaceae*

3.23.6.2 Faunal Species

No scientific study to assess presence and abundance of wildlife in *Law Lyngdoh Erbamon* has been carried out so far. However, as per the local residents, presence of some wild animals of amphibians, reptile, bird and mammal classes has been reported in this forest.

3.23.7 Growing Stock

As per the methodology described in Chapter-II, enumeration was carried out in 100% area of the forest as its area is less than 2 ha. All the trees, having girth (over bark) at breast height more than 30 cm were enumerated by measuring the top height (in meters) and the girth (in centimetres) at breast height. Data collected during the enumeration were entered in Sacred Groves Description Form and Plot Enumeration Form. During the enumeration within the grove, data were collected for 27 trees consisting of 6 *Toona ciliata* (1st dominant), 3 *Ficus cunia* (2nd dominant), 3 *Trema orientale* (3rd dominant) and 15 trees of rest of the species. Using the Local Volume Equations given in Chapter – II, girth class wise volume was calculated for each species for each of the 13 girth classes starting from 30-40 cm to 151 cm and above. Details of the same are given in the Table 3.23.7 below. As may be seen, total growing stock in this forest is 16.35 cubic metres.

Table 3.23.7: Species wise distribution of growing stock in different girth classes in the entire forest *(cum)*

Girth Class (cm)	*Toona ciliata* (1st dominant)	*Ficus cunia* (2nd dominant)	*Trema orientale* (3rd dominant)	Rest of the species	Total	% of total growing stock
30-40	0.00	0.77	0.07	0.04	**0.88**	5.38
41-50	0.00	0.00	0.00	0.38	**0.38**	2.32

51-60	0.58	0.00	0.00	0.71	**1.29**	7.89
61-70	0.78	0.00	0.38	0.00	**1.16**	7.09
71-80	0.56	0.00	0.00	0.00	**0.56**	3.43
81-90	0.00	0.00	0.00	0.65	**0.65**	3.98
91-100	0.98	0.00	0.96	0.00	**1.94**	11.87
101-110	0.00	0.00	0.00	3.38	**3.38**	20.67
111-120	0.00	0.00	0.00	1.42	**1.42**	8.69
121-130	0.00	0.00	0.00	4.69	**4.69**	28.69
131-140	0.00	0.00	0.00	0.00	**0.00**	0.00
141-150	0.00	0.00	0.00	0.00	**0.00**	0.00
151 & above	0.00	0.00	0.00	0.00	**0.00**	0.00
Total	**2.90**	**0.77**	**1.41**	**11.27**	**16.35**	100.00
% of total growing stock	**17.74**	**4.71**	**8.62**	**68.93**	**100.00**	

As may be seen, 17.74 %, the total growing stock is contributed by the 1st dominant species (*Toona ciliata)*. The 2nd dominant species (*Ficus cunia)* constitutes 4.71% of the total growing stock. Similarly, the 3rd dominant species *(Trema orientale)* constitutes 8.62 % of the total growing stock. A major part of the growing stock (*i.e.* 68.93 %) is constituted by the rest of the species.

Figure 3.23.1:Girth class-wise distribution of growing stock

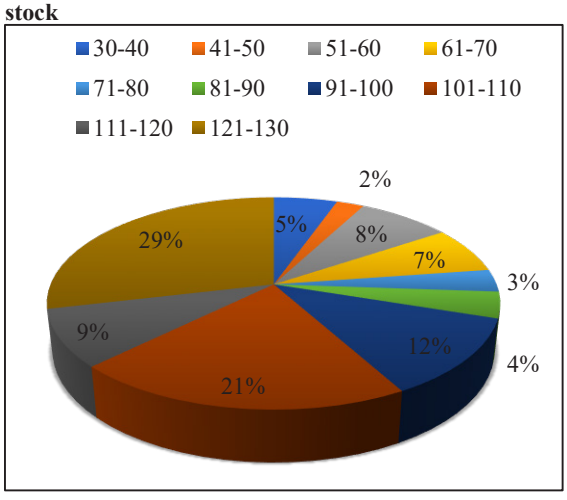


Figure 3.23.2: Species-wise distribution of growing stock

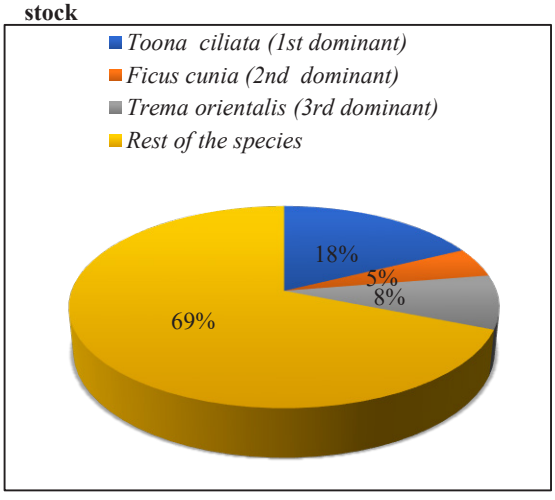


Figure 3.23.3:Girth class-wise distribution of growing stock

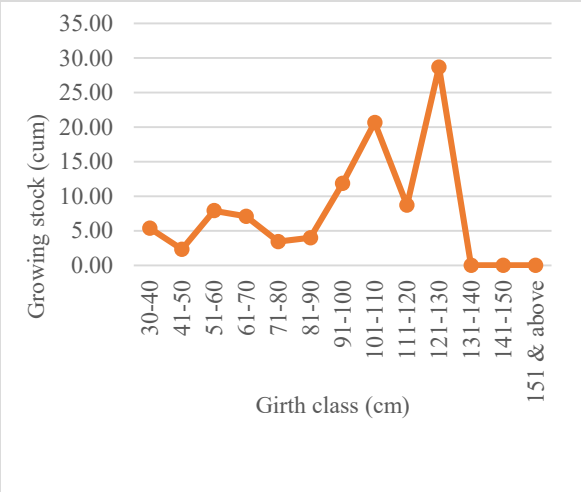
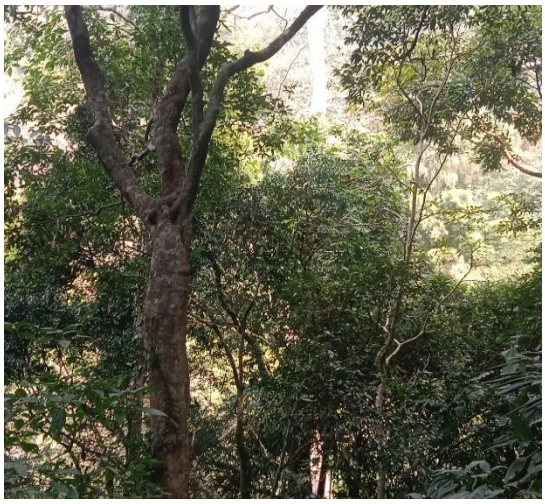


Figure 3.23.4: Over view of *Law Lyngdoh Erbamon*



3.23.8 Number of Stems

Species-wise number of stems in each girth class are given in Table 3.23.8 below. As may be seen maximum numbers of stems are found in lower girth classes *i.e.* from 30-40 cm to 71-80 cm. Number of stems in a girth class is more or less inversely proportional to mid-diameter of the girth class.

Table 3.23.8: Species-wise distribution of stems in different girth classes in the entire forest

(numbers of stems)

Girth Class (cm)	*Toona ciliata* (1st dominant)	*Ficus cunia* (2nd dominant)	*Trema orientale* (3rd dominant)	Rest of the species	Total
30-40	0	3	1	1	5
41-50	0	0	0	3	3
51-60	2	0	0	3	5
61-70	2	0	1	0	3
71-80	1	0	0	0	1
81-90	0	0	0	1	1
91-100	1	0	1	0	2
101-110	0	0	0	3	3
111-120	0	0	0	1	1
121-130	0	0	0	3	3
131-140	0	0	0	0	0
141-150	0	0	0	0	0
151 & above	0	0	0	0	0
Total	**6**	**3**	**3**	**15**	**27**

Figure 3.23.5: Number of stems in different girth classes

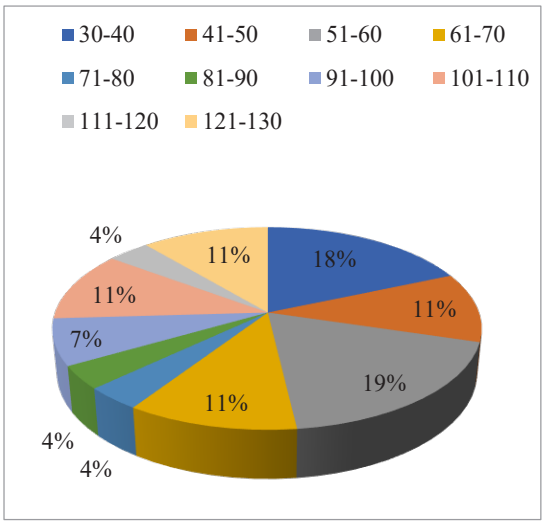


Figure 3.23.6: species-wise distribution of stems

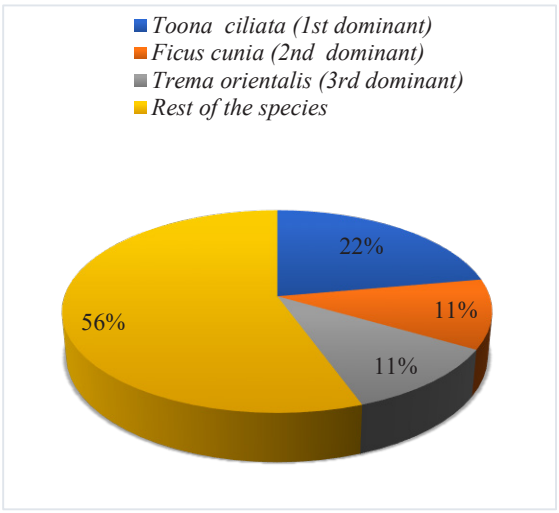


Figure 3.23.7: Number of stems in different girth classes

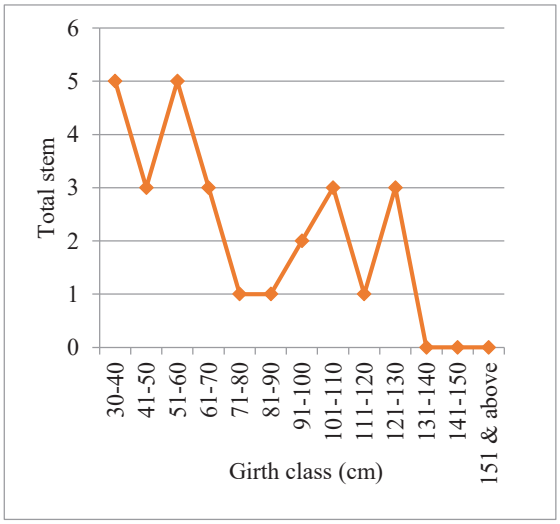


Figure 3.23.8: Overview of *Law Lyngdoh Erbamon*



3.23.9 Prescriptions for Future Management

3.23.9.1 Registration with the Khasi Hills Autonomous District Council

The United Khasi-Jaintia Hills Autonomous District (Management and Control of Forests) Rules, 1960 provides for registration of each *Law Adong/Law Lyngdoh* located in areas falling under jurisdiction of the Khasi Hills Autonomous District Council (KHADC). Though these rules came into force about 65 years ago, the *Law Lyngdoh Erbamon* has not been registered with the KHADC. The Chief Forest Officer of the KHADC and the clan representative of the *Law Lyngdoh* may take immediate necessary actions, as provided in Chapter-I of the said rules to register the *Law Lyngdoh*

Erbamon with the KHADC. The same will accord legal recognition and protection from diversion for non-forestry purposes.

3.23.9.2 Notification as Community Reserve

Section 38C of the Wild Life (Protection) Act, 1972 provides that the State Government may, where the community or an individual has volunteered to conserve wild life and its habitat, declare any private or community land not comprised within a National Park, Wildlife Sanctuary or a Conservation Reserve, as a Community Reserve, for protecting fauna, flora and traditional or cultural conservation values and practices. Notification of an area as a Community Reserve accords it legal protection. It will also make it eligible to receive financial assistance under a Centrally Sponsored Scheme of 'Integrated Development of Wildlife Habitats'. The clan representative of Law *Lyngdoh Erbamon* and Wildlife Wing in the Forest and Environment Department, Government of Meghalaya may therefore take necessary actions for notification of the *Law Kyntang Erbamon* as a Community Reserve.

3.23.9.3 Boundary Demarcation

Boundary of the *Law Lyngdoh Erbamon* has not been physically demarcated on the ground. Since the grove is bounded by private land in all directions, hence to prevent and to ensure early detection of encroachments, boundary of the *Law Lyngdoh Erbamon* may be demarcated on the ground by erection of RCC boundary pillars and painting of rings on stem of trees standing on the boundary.

3.23.9.4 Fire Protection

As per the Meghalaya Forest Fire Information System developed by the North Eastern Space Application Centre (NESAC) no fire incident has occurred in the *Law Lyngdoh Erbamon* , during a period of last 22 years from 2002 to 2024**.** As per the said system a major part of the *Law Lyngdoh Erbamon* is moderately vulnerable to forest fires. Similarly, as per the said information system, *Law Lyngdoh Erbamon* is not prone to forest fire. To prevent damage to the *Law Lyngdoh Erbamon* from accidental forest fires, measures such as creation and periodic cleaning of fire line along the periphery and at critical locations within the *Law Lyngdoh Erbamon* and engagement of fire watchers during the critical months may be undertaken.

3.23.9.5 Construction of Soil Moisture Conservation and Water Harvesting Structures

No perennial stream flows through the Law *Lyngdoh Erbamon*. To prevent and minimise soil erosion and to improve moisture regime, water harvesting structure such as of check dam, contour trench, *etc.* may be constructed at suitable locations in the *Law Lyngdoh Erbamon.*

3.23.9.6 Creation of Eco-Tourism Facilities

To create awareness about rich biodiversity of the *Law Lyngdoh Erbamon* and also to create livelihood opportunities for local residents, eco-tourism facilities such as rain shelter cum view point, footpath, walking trail, sign board, washroom *etc.* may be constructed to attract visitors.

3.23.9.7 Restocking of Degraded Areas

Efforts may be made to restock degraded patches in *Law Lyngdoh Erbamon* by assisting and promoting natural regeneration of native species. Areas which cannot be restocked by natural regeneration alone may be afforested by planting seedlings of native species.

3.23.9.8 Formulation of A Proposal and Registration Thereof on Carbon Registry to Earn Carbon Credits

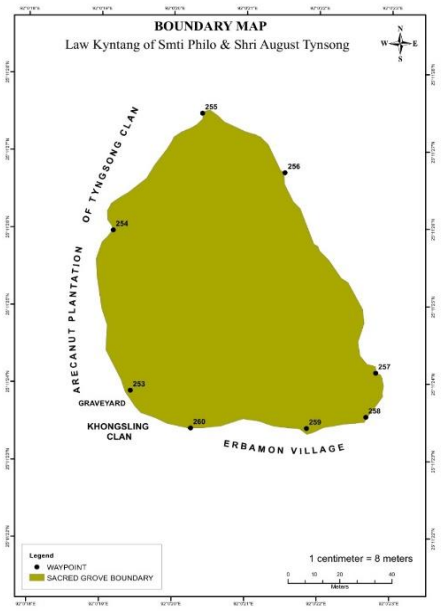
To reward the local communities for their efforts in conservation and protection of *Law Lyngdoh Erbamon* for centuries, a proposal may be formulated and registered on an appropriate carbon registry to earn carbon credits for measures to be undertaken by the local communities for better protection and conservation of the *Law Lyngdoh Erbamon.*

3.23.9.9 Awareness Campaign

The *Law Lyngdoh Erbamon* has been protected by the ancestors of the clan for centuries for religious, ecological and cultural beliefs. With gradual subordination of these beliefs, the clan's concern for conservation and protection of sacred groves and other community owned forests is gradually eroding. The same therefore needs to be revived and strengthened by creating awareness among the clan, local communities and grass root level institutions about cultural, ecological and economic importance of sacred groves and other community owned forests.

3.24. *LAW KYNTANG OF SMTI. PHILO TYNSONG & SHRI AUSUST TYNSONG*

3.24.1 Location



Law Kyntang of *Smti. Philo Tynsong & Shri August Tynsong* is located in East Khasi Hills District of Meghalaya at *Erbamon* village under *Hima Khyrim* Syiemship. It covers an area of 0.99 ha. and lies between 25° 11.24" to 25° 11.27″ N latitude and 92° 0′ 19″ to 92° 0′ 23″ E longitude at an altitude of about 126 m above mean sea level. It is bounded in the North-West and North-East by land of *Tynsong* clan and in the South by graveyard of *Khongsling* clan and *Erbamon* village. It is accessible from Shillong by Shillong – Pynursla Highways. It is located at a distance of about 80 km from from Shillong.

3.24.2 Brief History

Law Kyntang of Smti Philo Tynsong & Shri August Tynsong was established by the *Tynsong* clan for several centuries ago. In the past, religious rituals were performed in this grove. This *Law Kyntang* has been preserved by the *Tynsong* clan till date in honour of their ancestors. With emphasis on biodiversity conservation this

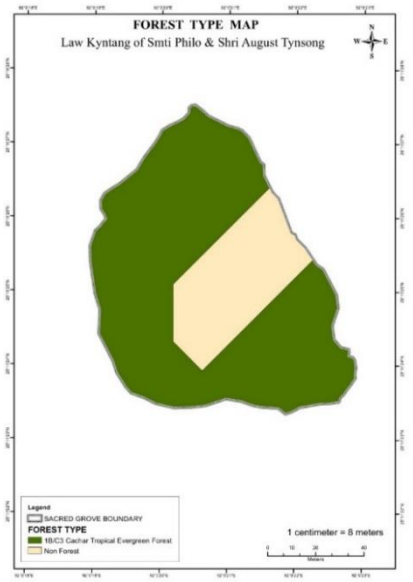
legacy has been preserved through generations. Entry into this grove, causing damage to the forest and even plucking of leaves of plants standing therein is strictly prohibited. This *Law Kyntang* is managed and administered by the elders of *Tynsong* clan.



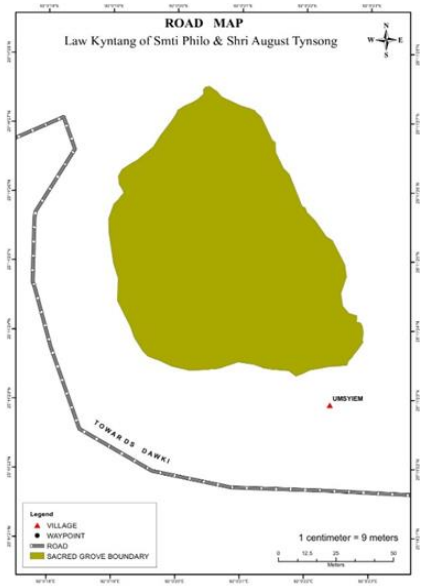
Biotic pressures such as encroachment, hunting, poaching and illegal felling of trees are found to be absent from this forest.

3.24.3 Geography and Climate

Topography of the *Law Kyntang of Smti Philo Tynsong & Shri August Tynsong* is gentle rolling in nature with slope varying from 0.2° to 28°. Major part of the *Law Kyntang of Smti Philo Tynsong & Shri August Tynsong* falls under the South-East and Southern aspects. A small area of this forest falls under the western Aspect. Soil texture is sandy with no coarse fragments. Soil consistency is slightly compact. The soil is brown in colour and the soil is shallow in depth. Stoniness is moderate in this grove.



Winter season starts from October end and lasts till February. It receives high rainfall during the monsoon season from April to September end. The average temperature varies from 9° C to 32° C.



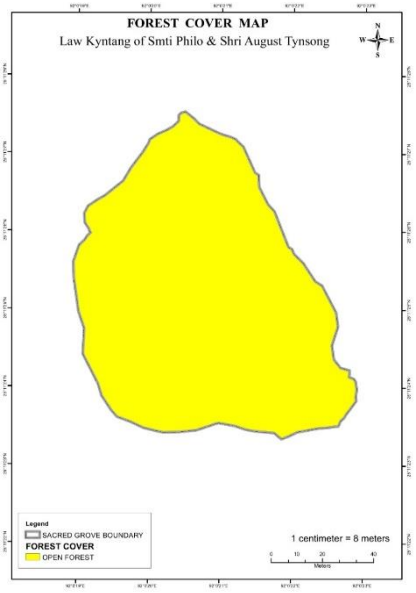
3.24.4 Forest Type

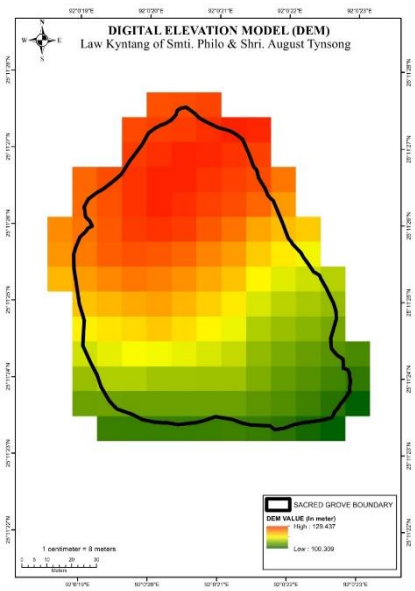
As per the Champion and Seth classification (1968), forests found in the sacred grove are of the ***Type 1B/C3 CacharTropical Evergreen Forest.***

3.24.5 Forest Cover

As per the India State of Forest Report-2021 published by the Forest Survey of India, Dehradun, forest cover in the *Law Kyntang of Smti Philo Tynsong & Shri August Tynsong* is as below:

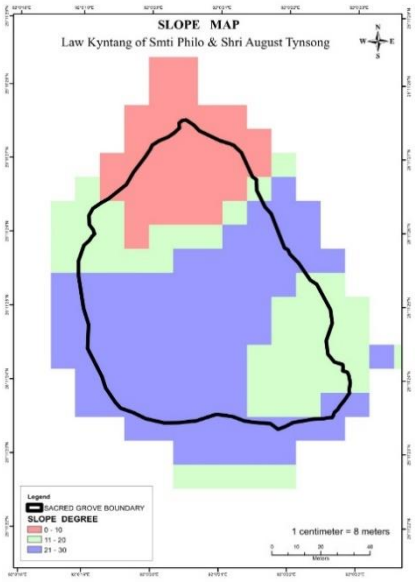
Forest Cover	Area (ha.)	% of total Area
Very Dense Forest (> 70%)	0	0
Moderately Dense Forest (40 %-70 %)	0	0
Open Forest (10% - 40%)	0.99	100
Scrub Forest (<10%)	0	0
Non-Forest	0	0
Total	**0.99**	**100**

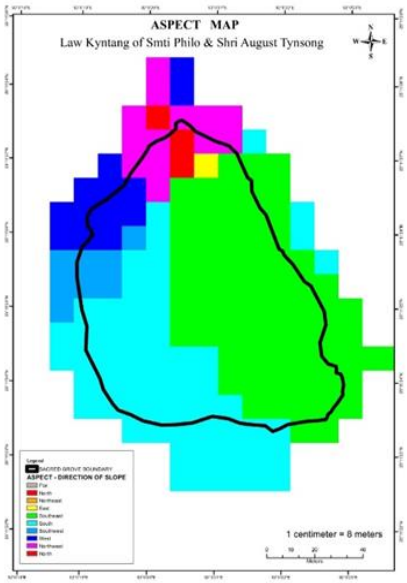




3.24.6 Flora and Fauna

The *Law Kyntang of Smti Philo Tynsong & Shri August Tynsong* is home to open degraded forest of natural origin. *Rhus succedanea* and *Glycosmis pentaphylla* are respectively 1st and 2nd dominant tree species. The forest is home to some rare, endangered and endemic plant species.





3.24.6.1: Floral species

Table 3.24.1: Trees found in Law Kyntang of Smti Philo Tynsong & Shri August Tynsong

Sl. No.	Local Name	Botanical Name	Family
1.	*Dieng sohthyrthia*	*Acer laevigatum*	*Sapindaceae*
2.	*Dieng kreit*	*Albezia lebbek*	*Fabaceae*
3.	*Dieng bsein*	*Arisaema tortuosum*	*Araceae*
4.	*Dieng tlai*	*Caryota urens*	*Arecaceae*
5.	*Dieng phyniaw*	*Cepadoss fruicosa*	*Meliaceae*
6.	*Dieng lymbaw*	*Dillenia indica*	*Dilleniaceae*
7.	*Dieng sohsarynkho*	*Fagraea ceilanica*	*Gentianaceae*
8.	*Dieng soh jyllop*	*Ficus sarmentosa*	*Moraceae*
9.	*Dieng ksiar*	*Glycosmis pentaphylla*	*Rutaceae*
10.	*Dieng pangknai*	*Holarrhena antidysenterica*	*Apocynaceae.*
11.	*Dieng jali*	*Ilex godajam*	*Aquifoliaceae*
12.	*Dieng jalwa*	*Litsea polyantha*	*Lauraceae*
13.	*Dieng sohniar*	*Machilus parviflora*	*Lauraceae*
14.	*Dieng kain*	*Rhus succedanea*	*Anacordiaceae*
15.	*Dieng jalong*	*Sapium bacatum*	*Euphorbiaceae*
16.	*Dieng langkharu*	*Uraria crinita*	*Fabaceae*
17.	*Dieng shiah*	*Zanthoxylum ovalifolium*	*Rutaceae*

Table 3.24.2: Shrubs found in Law Kyntang of Smti Philo Tynsong & Shri August Tynsong

Sl No.	Local Name	Botanical Name	Family
1.	*Dieng soh pyrsit*	*Eurya accuminata*	*Theaceae*
2.	*Dieng soh jabuit*	*Phlogacanthus thyrsiflorus*	*Acanthaceae*
3.	*Dieng soh jaremiong*	*Clerodendrum colebrookianum*	*Verbenaceae*
4.	*Dieng soh jamynsait*	*Gaultheria fragrantissima*	*Ericaceae*
5.	*Dieng sohlang*	*Viburnum foetidum*	*Caprifoliaceae*
6.	*Dieng ronong*	*Mahonia pycnophylla*	*Berberidaceae*

Table 3.24.3: Herbs found in Law Kyntang of Smti Philo Tynsong & Shri August Tynsong

Sl No.	Local Name	Botanical Name	Family
1.	*Synrai khlaw*	*Alpinia spp.*	*Gingiberaceae*
2.	*Syieng khlaw*	*Zingiber purpureum*	*Zingiberaceae*
3.	*Jajew khlaw*	*Begonia roxburghii*	*Begoniaceae*
4.	*Wang khlaw*	*Esculenta spp.*	*Araceae*
5.	*Bat eroplain*	*Inula cappa*	*Asteraceae*
6.	*Soh byrthit*	*Urena lobata*	*Malvaceae*

Table 3.24.4: Climbers found in Law Kyntang of Smti Philo Tynsong & Shri August Tynsong

Sl No.	Local Name	Botanical Name	Family
1.	*Jyrmi lieh*	*Clematis buchananiana*	*Ranunculaceae*
2.	*Lapadong*	*Hiptage benghalensis*	*Malpighiaceae*
3.	*Shiah nepbah*	*Ampelocissus latifolia*	*Vitaceae*
4.	*Jermi sohlah*	*Gynura bicolor*	*Asteraceae*
5.	*Jyrmi pur*	*Cocculus hirsutus*	*Menispermaceae*
6.	*Shiah sohkrot*	*Smilax glabra*	*Smilacaceae*

Table 3.24.5: Grasses found in Law Kyntang of Smti Philo Tynsong & Shri August Tynsong

Sl No.	Local Name	Botanical Name	Family
1.	Phlang prut	*Juncus effusus*	*Juncaceae*
2.	*Phlang tylli*	*Arundinellakhasiana*	*Poaceae*
3.	*Synsar*	*Thysanolaena maxima*	*Poaceae*

Table 3.24.6: Ferns found in Law Kyntang of Smti Philo Tynsong & Shri August Tynsong

Sl No.	Local Name	Botanical Name	Family
1.	*Tyrkhang*	*Polypodium spp*	*Polypodiaceae*
2.	*Tyrkhang iong*	*Adiantum raddianum*	*Pteridaceae*
3.	*Thyrkhang maw*	*Cyathea gigantea*	*Cyatheaceae*

3.24.6.2 Faunal Species

No scientific study to assess presence and abundance of wildlife in *Law Kyntang of Smti Philo Tynsong & Shri August Tynsong* has been carried out so far. However, as per the local residents, presence of some wild animals under amphibians, reptile, bird and mammal classes has been reported in this forest.

3.24.7 Growing Stock

As per the methodology described in Chapter-II, enumeration was carried out in 100% area of the forest as its area is less than 2 ha. All trees, having girth (over bark) at breast height more than 30 cm, were enumerated by measuring the top height (in meters) and the girth (in centimetres) at breast height. Data collected during the enumeration were entered in Sacred Groves Description Form and Plot Enumeration Form. During the enumeration within the grove, data were collected for 52 trees consisting of 9 *Rhus succedanea* (1st dominant), 6 *Glycosmis pentaphylla* (2nd dominant), 5 *Caryota urens* (3rd dominant) and 32 trees of rest of species. Using the Local Volume Equations given in Chapter –II, girth class wise volume was calculated for each species for each of the 13 girth classes starting from 30 - 40 cm to 151 cm and above. Details of the same are given in the Table 3.24.7 below. As may be seen, total growing stock in this forest is 37.58 cubic metres.

Table 3.24.7: Species wise distribution of growing stock in different girth classes in the entire forest

(cum)

Girth Class (cm)	*Rhus succedanea* (1st dominant)	*Glycosmis pentaphylla* (2nd dominant)	*Caryota urens* (3rd dominant)	Rest of the species	Total	% of total growing stock
30-40	0.07	0.00	0.00	0.03	**0.10**	0.27
41-50	0.00	0.16	0.00	0.74	**0.90**	2.39
51-60	0.00	0.26	0.23	2.01	**2.50**	6.65
61-70	0.00	0.00	1.07	2.71	**3.78**	10.06
71-80	0.46	0.00	0.49	1.06	**2.01**	5.35
81-90	1.55	0.76	0.00	3.73	**6.04**	16.07
91-100	2.71	0.00	0.00	0.94	**3.65**	9.71
101-110	0.00	1.02	0.00	0.00	**1.02**	2.71
111-120	1.25	0.00	0.00	1.30	**2.55**	6.79
121-130	0.00	1.66	0.00	1.55	**3.21**	8.54
131-140	0.00	0.00	0.00	1.89	**1.89**	5.03

141-150	0.00	0.00	0.00	0.00	**0.00**	0.00
151 & above	4.92	5.01	0.00	0.00	**9.93**	26.42
Total	**10.96**	**8.87**	**1.79**	**15.96**	**37.58**	100.00
% of total growing stock	**29.16**	**23.60**	**4.76**	**42.47**	**100.00**	

As may be seen, 29.16 %, the total growing stock is contributed by the 1st dominant species (*Rhus succedanea)*. The 2nd dominant species (*Glycosmis pentaphylla*) constitutes 23.60% of the total growing stock. Similarly, the 3rd dominant species *(Caryota urens)* constitutes 4.76 % of the total growing stock. A significant part of the growing stock (*i.e.* 42.47 %) is constituted by the rest of the species.

Figure 3.24.1:Girth class-wise distribution of growing stock

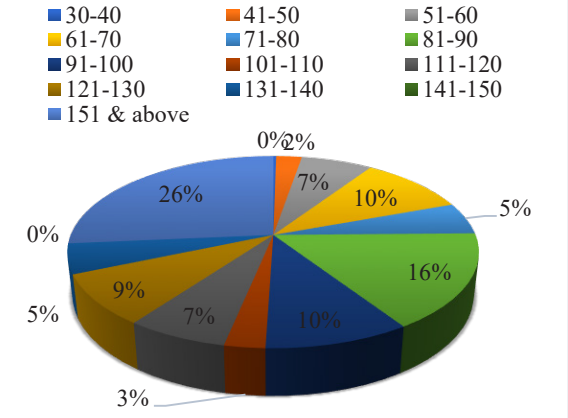


Figure 3.24.2: Species-wise distribution of growing stock

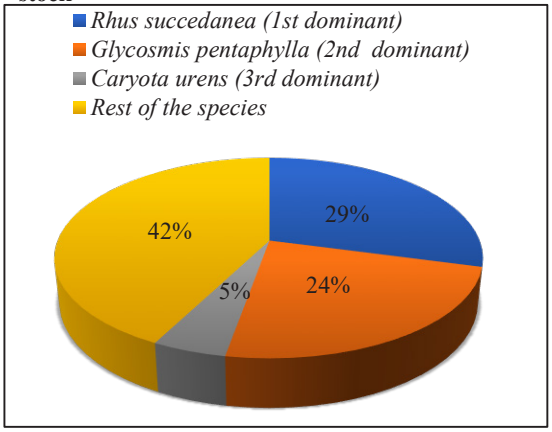


Figure 3.24.3:Girth class-wise distribution of growing stock

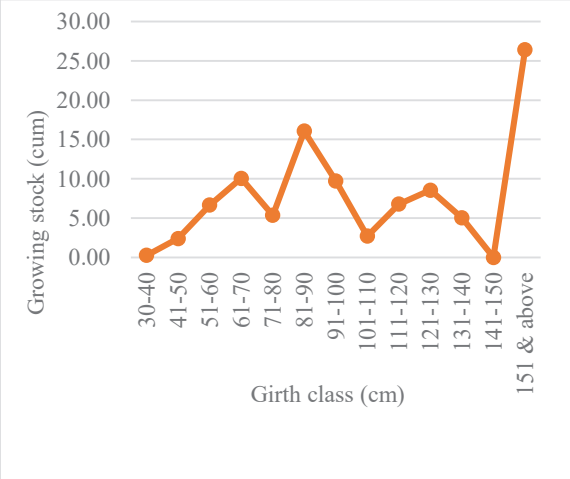


Figure 3.24.4: Overview of *Law Kyntang of Smti Philo Tynsong & Shri August Tynsong*



3.24.8 Number of Stems

Species-wise number of stems in each girth class are given in Table 3.24.8 below. As may be seen maximum numbers of stems are found in lower girth classes *i.e.* from 41-50 cm to 81-90 cm. It raises concerns about the status of regeneration.

Table 3.24.8: Species-wise distribution of stems in different girth classes in the entire forest

(numbers of stems)

Girth Class (cm)	*Rhus succedanea (1st dominant)*	*Glycosmis pentaphylla (2nd dominant)*	*Caryota urens (3rd dominant)*	Rest of the species	Total
30-40	1	0	0	1	2
41-50	0	1	0	5	6
51-60	0	1	1	8	10
61-70	0	0	3	7	10
71-80	1	0	1	2	4
81-90	2	1	0	5	8
91-100	3	0	0	1	4
101-110	0	1	0	0	1
111-120	1	0	0	1	2
121-130	0	1	0	1	2
131-140	0	0	0	1	1
141-150	0	0	0	0	0
151 & above	1	1	0	0	2
Total	**9**	**6**	**5**	**32**	**52**

Figure 3.24.5:Number of stems in different girth classes

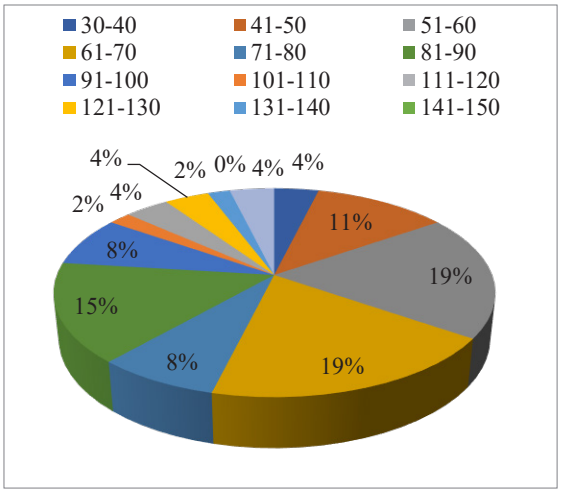


Figure 3.24.6: Species-wise distribution of stems

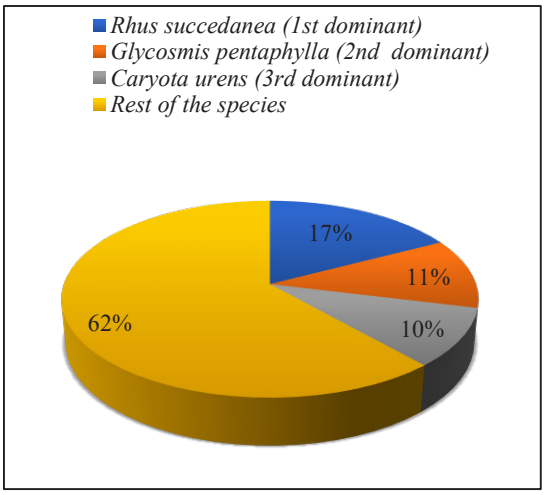


Figure 3.24.7: Number of Stems in different girth classes

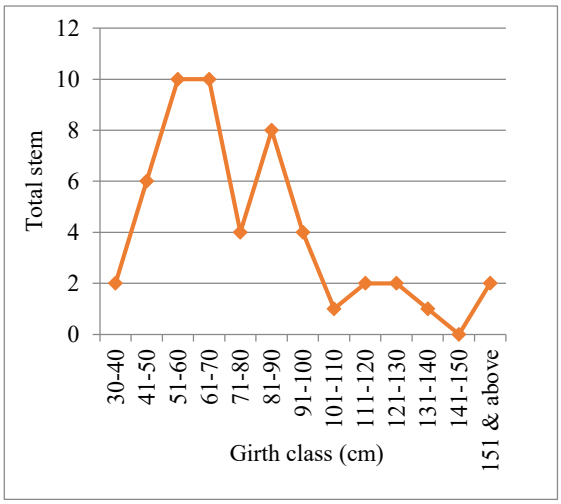


Figure 3.24.4: In side view of *Law Kyntang of Smti Philo Tynsong & Shri August Tynsong*



3.24.9 Prescriptions for Future Management

3.24.9.1 Registration with the Khasi Hills Autonomous District Council

The United Khasi-Jaintia Hills Autonomous District (Management and Control of Forests) Rules, 1960 provides for registration of each *Law Adong/Law Kyntang* located in areas falling under jurisdiction of the Khasi Hills Autonomous District Council (KHADC). Though these rules came into force about 65 years ago, the *Law Kyntang of Smti Philo Tynsong & Shri August Tynsong* has not been registered with the KHADC. The Chief Forest Officer of the KHADC and the clan representative of the *Law Kyntang* may take immediate necessary actions, as provided in Chapter-I of the said rules to register the *Law Kyntang of Smti Philo Tynsong & Shri August Tynsong* with the KHADC. The same will accord legal recognition and protection from diversion for non-forestry purposes.

3.24.9.2 Notification as Community Reserve

Section 38C of the Wild Life (Protection) Act, 1972 provides that the State Government may, where the community or an individual has volunteered to conserve wild life and its habitat, declare any private or community land not comprised within a National Park, Wildlife Sanctuary or a Conservation Reserve, as a Community Reserve, for protecting fauna, flora and traditional or cultural conservation values and practices. Notification of an area as a Community Reserve accords it legal protection. It will also make it eligible to receive financial assistance under a Centrally Sponsored Scheme of 'Integrated Development of Wildlife Habitats'. The clan representatives of *Law Kyntang* of Smti Philo Tynsong & Shri August Tynsong and Wildlife Wing in the Forest and Environment Department, Government of Meghalaya may therefore take necessary actions for notification of the *Law Kyntang of Smti Philo Tynsong & Shri August Tynsong* as a Community Reserve.

3.24.9.3 Boundary Demarcation

Boundary of the *Law Kyntang* of Smti Philo Tynsong & Shri August Tynsong has not been physically demarcated on the ground. The grove is surrounded by the private land and habitataions in *Erbamon* village. To prevent and to ensure early detection of encroachment, boundary of the *Law Kyntang* of *Smti Philo Tynsong & Shri August Tynsong* may be demarcated on ground by erection of RCC boundary pillars and painting of rings on stem of trees standing on the boundary.

3.24.9.4 Fire Protection

As per the Meghalaya Forest Fire Information System developed by the North Eastern Space Application Centre (NESAC) no fire incident has occurred in the *Law Kyntang* of *Smti Philo Tynsong & Shri August Tynsong,* during a period of last 22 years from 2002 to 2024. As per the said information system a major part of the *Law Kyntang* of *Smti Philo Tynsong & Shri August Tynsong* is moderately vulnerable to forest fires. However, as per the said information system, a major part of *Law Kyntang* of *Smti Philo Tynsong & Shri August Tynsong* is not prone to forest fire. To prevent damage to the *Law Kyntang* of *Smti Philo Tynsong & Shri August Tynsong* from accidental forest fires, measures such as creation and periodic cleaning of fire lines along the periphery and at critical locations within the *Law Kyntang* of *Smti Philo Tynsong & Shri August Tynsong* and engagement of fire watchers during the critical months may be undertaken.

3.24.9.5 Construction of Soil Moisture Conservation and Water Harvesting Structures

No perennial stream flows in this *Law Kyntang*. To prevent and minimise soil erosion and to improve moisture regime, soil and water conservation structures such as check dam, contour trench, etc. may be constructed at suitable locations in the *Law Kyntang* of *Smti Philo Tynsong & Shri August Tynsong.*

3.24.9.6 Creation of Eco-Tourism Facilities

To create awareness about rich biodiversity of the *Law Kyntang* of *Smti Philo Tynsong & Shri August Tynsong* and also to create livelihood opportunities for local residents, eco-tourism facilities such as rain shelter cum view point, footpath, walking trail, sign board, washrooms *etc.* may be built to attract visitors.

3.24.9.7 Restocking of Degraded Areas

Efforts may be made to restock the degraded patches in *Law Kyntang* of *Smti Philo Tynsong & Shri August Tynsong* by assisting and promoting natural regeneration of native species. The areas which cannot be restocked by natural regeneration alone, may be afforested by planting seedlings of native species.

3.24.9.8 Formulation of a Proposal and Registration Thereof on Carbon Registry to Earn Carbon Credits

To reward the local communities for their efforts in conservation and protection of *Law Kyntang* of *Smti Philo Tynsong & Shri August Tynsong* for centuries, a proposal may be formulated and registered on an appropriate carbon registry to earn carbon credits for measures to be taken by the

local communities for better protection and conservation of the *Law Kyntang* of *Smti Philo Tynsong & Shri August Tynsong.*

3.24.9.9 Awareness Campaign

The *Law Kyntang* of *Smti Philo Tynsong & Shri August Tynsong* has been protected for centuries by ancestors of the clan for spiritual, ecological and cultural beliefs. With gradual subordination of these beliefs, the clan's concern for conservation and protection of sacred groves and other community owned forests is gradually eroding. The same therefore needs to be revived and strengthened by creating awareness among the clan, local communities and grass root level institutions about cultural, ecological and economic importance of sacred groves and other community owned forests.



For any information please contact
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