

Sylvan Mosaic

Department of Forests & Environment
Government of Meghalaya



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Meghalaya, the abode of clouds, comprises a geographical area of 22,429 Sq kms and is located between 25^0 02"N to 26^0 06"N Latitude and 89^0 48"E to 92^0 50"E Longitude. It is bounded on the Northern and Eastern sides by the State of Assam. On the South and South-Western side, it shares a 423 kms long international boundary with Bangladesh.

Shillong is the capital of Meghalaya and is known as the "Scotland of the East". The State is part of the Indo-Burma biodiversity hot spot and is a key area for biodiversity conservation due to its high species biodiversity and high level of endemism. The total forest and tree cover of the State extends to around 76.77% of its geographical area, as per the Forest Survey Report of 2015.

The forests of Meghalaya encompass a large variety of flora and fauna. The climate is monsoonic with distinct warm-wet and cold-dry periods. The towns of Cherrapunjee and Mawsynram, which are located on the Southern part of the State, receive very heavy rainfall and are amongst the wettest spots in the world. The population is predominantly tribal, comprising three major tribes viz., Khasi, Jaintia and Garos, who make up around 89% of the State population.



MAWSYNRAM

The Forest Directorate comprises 4 (four) Wings, viz Territorial, Wildlife, Social Forestry & Environment and Climate Change, Research & Training Wings which all function under the overall supervision of the Principal Chief Conservator of Forests & Head of Forest Force. The Wings are divided into Divisions. which are further sub divided into Ranges and Beats.

The Territorial Wing manages the Reserved Forests and Protected Forests of the State. The main activities are protection and conservation of the Reserved Forests , statewide implementation of Forests Act and Rules related thereto and collection of revenue.

The Wildlife Wing controls the National Parks, Wildlife Sanctuaries and the Biosphere Reserve. It is headed by the Chief Wildlife Warden who oversees the implementation of the Wildlife Protection Act throughout the State. The main activities are protection and conservation of wildlife including habitat maintenance within & outside the Government controlled areas.

The Social Forestry Wing undertakes afforestation of degraded forests which are outside Government control with an objective to maintain and improve the greenery of the State.

The Climate Change, Research & Training Wing conducts research and training of technical staff. The Wing formulates scientific Working Plans for the maintenance of Reserved and Protected Forests and Working Schemes for forest areas which are outside Government control. Of late, the matters related to climate change have also been entrusted to this Wing.

LEGAL PROVISIONS GOVERNING THE MANAGEMENT OF FORESTS

State Government Statutes Implemented by the Forest Department

The Meghalaya Forest Regulation (Application & Amendment) Act, 1973 is the main statute governing the working of the Territorial Wing. This regulation has provisions for procedures to be adopted for constitution of Reserved Forests, procedures to be adopted and quantum of penalty to be imposed on forest offenders, regulation of transit of forest produce including levy of transit fee and royalty thereon, establishment and working of wood based industrial units, and matters related to management of forest areas.

Certain Rules have been framed under Provisions of the Act viz:-

The Meghalaya Tree Felling (Non-forest areas) Rules, 2006 provides for the regulation of harvesting of timber from tree plantations (non-forest areas).

The Meghalaya Charcoal (Control of Production, Storage, Trade and Transit) Rules, 2008 provides for regulating the production of storage, trade and transit of charcoal.

The Meghalaya Tree (Preservation) Act, 1976 contains provisions for regulating the felling of trees for the purposes of protection of catchment areas and the preservation of the special characteristics of the hilly areas. It is applicable to areas located within a radius of 10 km from the Deputy Commissioner's Office, Shillong.

The Meghalaya Forests (Removal of Timber) (Regulation) Act, 1981 contains provisions to regulate and control the removal of timber outside the State.

The Meghalaya Protection of Catchment Areas Act, 1990 was enacted to regulate land-use in important catchment areas of the State and protect these areas from further degradation in order to maintain the soil cover and improve water regime of the land. **The Meghalaya Protection of Catchment Areas Rules, 1996** were framed in 1996.

Central Government Statutes Implemented by the Forest Department

The Wildlife (Protection) Act, 1972 contains provisions for conservation and protection of wildlife and their habitat and matters connected therewith and incidental thereto. It is the principal Act governing the working of the Wildlife Circle of the Meghalaya Forest Department.

The Forest (Conservation) Act, 1980 provides for the conservation of forests by way of regulation of de-reservation of Reserved Forests and diversion of forest land for non-forest purposes and for matters connected therewith.

The Biological Diversity Act, 2002 aims at conservation of biological diversity, sustainable use of tis components and provides mechanisms for equitable sharing of benefits arising out of the use of biological resources and knowledge. It enables States to notify rules for functioning of State Biodiversity Boards. Meghalaya has notified its rules known as the Meghalaya Biodiversity Rules, 2010.

CENTRAL GOVERNMENT ACTS AND RULES ON ENVIRONMENT

The Water (Prevention and Control of Pollution) Act, 1974

The main purpose of the Act is to prevent and control the pollution of water. Along with this objective, it also aims to maintain or restore wholesomeness of water and to constitute Boards for the said purpose. Meghalaya has also framed and notified its own rules, viz the Meghalaya Water (Prevention and Control of Pollution) Rules, 197

The Water (Prevention and Control of Pollution) Cess Act, 1975

Parliament adopted the Water (Prevention and Control of Pollution) Cess Act, 1977 to provide funds for the Central & State Pollution Control Boards. The Act empowers the Central Government to impose a Cess on water consumed by industries listed in Schedule-I of the Act. The industries as specified Schedule-I in and local authorities are required to pay the water Cess as per the quarterly of water Schedule-I. The Central notified the Rules under the Act in 1978.

The Air (Prevention and Control of Pollution) Act, 1981

The Act aims to preserve the quality of air and to control air pollution. It enables State Governments to frame their own rules and notify them. Accordingly, Meghalaya has notified its own rules entitled the Meghalaya Air (Prevention and Control of Pollution) Rules, 1988



The Environment (Protection) Act, 1986

Popularly known as an umbrella Act, It fills in gaps not covered by the special Act on Water and Air mentioned above. It provides for the protection and improvement of environment and for matters connected therewith. By protecting and improving environment, it aims at prevention of hazards to human beings, other living creatures, plants and property. The Act enables only the Central Government to establish any authority and frame Rules. The rules include matters relating to hazardous chemicals, Microorganism, Chemical accidents, Ozone depleting substances, Noise, Batteries, Plastic wastes, Solid Wastes, Bio-Medical wastes, Construction and demolition wastes, Hazardous and other wastes, E-Wastes.



The Public Liability Insurance Act, 1991

It provides immediate relief to persons affected by accident occurring while handling any hazardous substance. The Deputy Commissioner of a District is empowered to enforce the Act. The Government notified the Public Liability Insurance Rules, 1991

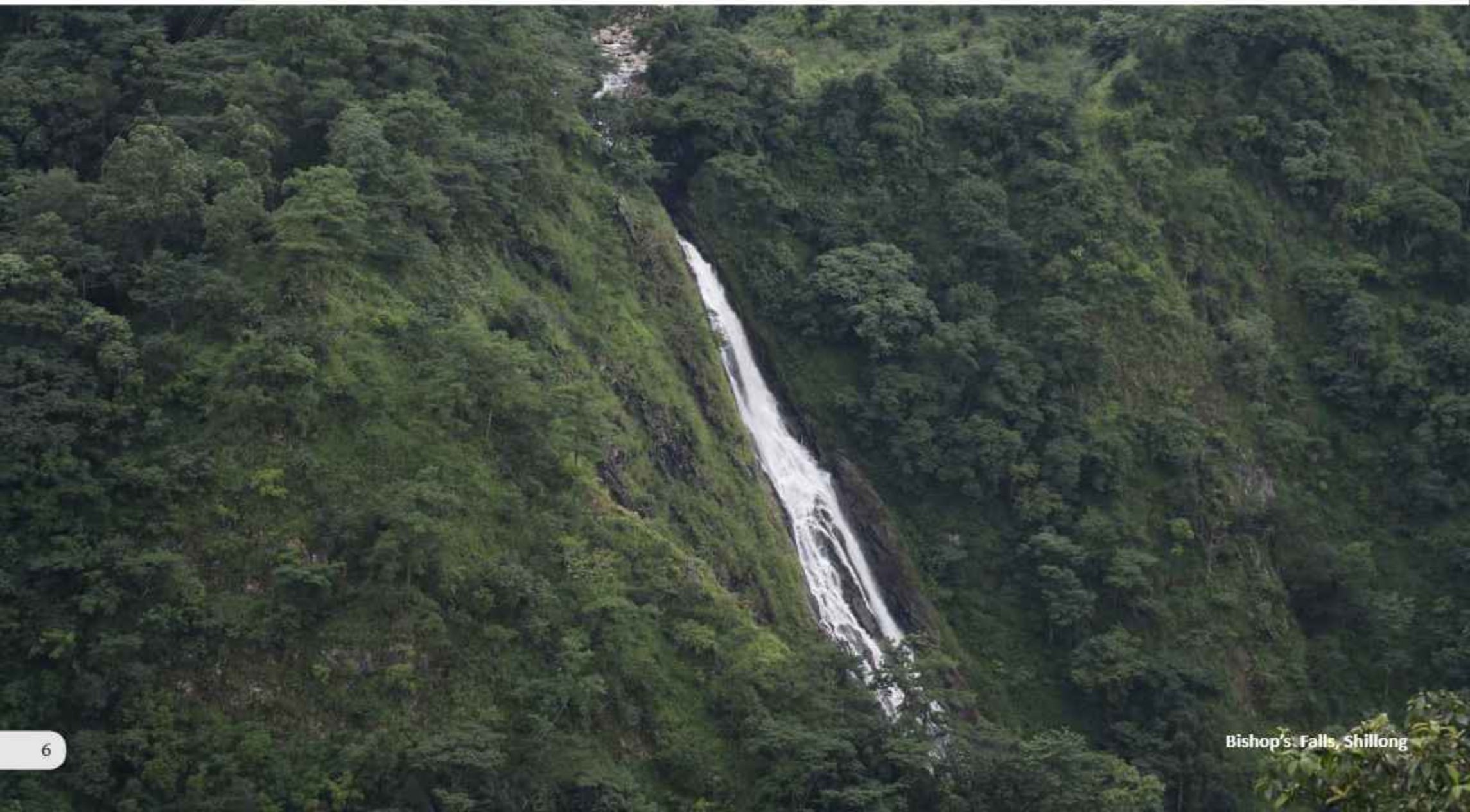
The National Green Tribunal Act, 2010

It provides for effective and expeditious disposal of cases relating to environmental protection and conservation of forests and other natural resources including enforcement of any legal right relating to environment and giving relief and compensation for damages to persons and property. Apart from the Principal Bench at New Delhi, it has a Bench for Eastern Zone at Kolkata which has jurisdiction over Meghalaya and other NE States also.



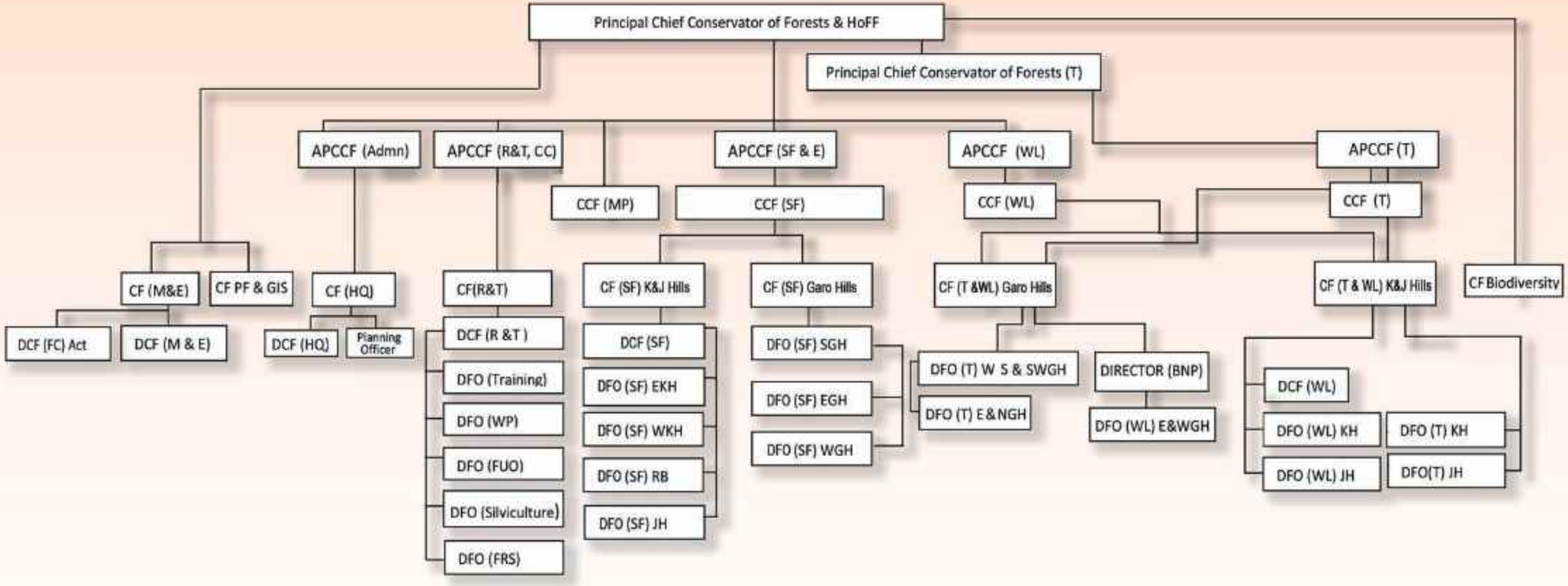
Statutes Implemented by the Autonomous District Councils

For management of forest areas under their administrative control, each District Council has enacted relevant Acts viz. **The United KhasiJaintia Hills Autonomous District (Management and Control of Forests) Act, 1958** and the **Garo Hills Autonomous District (Management and Control of Forests) Act, 1958.** The Acts contain provisions related to many aspect of the forest areas under the administrative control of these District Councils. These Acts can also be considered as pioneer acts of forest administration within the District Council areas in the North-Eastern region as most of the other District Councils of the region still follow these Acts with minor modifications.



Bishop's Falls, Shillong

STRUCTURAL ORGANISATION OF THE DIRECTORATE OF FORESTS & ENVIRONMENT



Forests of Meghalaya





The forests of Meghalaya are remarkably rich in biodiversity. The undulating hilly terrain, where the plateau is dissected by rain-fed rivers, streams and deep ravines, waterfalls and hills covered with rich vegetation present a picturesque landscape. These forests are also home to rare and endemic plants and animals. The abundance of vegetation ranging from temperate, sub-tropical upto tropical types are due to the topography and variation in rainfall. The undisturbed primary forests are botanically well-known and extraordinarily rich. Meghalaya is one of the richest and most interesting botanical regions in the whole of Indian Sub-Continent (Hooker and Thomson 1855, Clarke 1898, Chatterjee 1962). Many well-known British Botanists, Buchanan - Hamilton 1820, Roxburgh 1820-1824, Wallich 1832, Griffith 1820-32, Hooker 1848-1854, 1872-97, Burkhill 1925, Bor 1940-1942) have carried out extensive studies in this region. They considered this area as a "Botanists' Paradise".

Government owned forests viz., Reserved Forests and Protected Forests are managed according to scientific Working Plans prepared by the Forest Department. The Department also formulates Working Schemes for management of natural forests not under Government control.

Wildlife Protected areas which are under Government control such as National Parks, Wildlife Sanctuaries and Biosphere Reserves are managed under scientific Management Plans formulated by the Wildlife Wing of the Forests & Environment Department.

Forest areas notified under the Assam Forest (Regulation) Act 1891 in the state are given in the following tables. Administrative control of these forests rests with the State Forest Department. Forests outside State Government control fall under the jurisdiction of the Autonomous District Council.

RESERVED FORESTS IN MEGHALAYA

GARO HILLS DISTRICTS

1. Chimabangshi Reserved Forest
2. Dhima Reserved Forest
3. Rajasimla Reserved Forest
4. Dilma Reserved Forest
5. Ildek Reserved Forest
6. Darugiri Reserved Forest
7. Rongrengiri Reserved Forest
8. Dambu Reserved Forest
9. Songsak Reserved Forest
10. Dibru Hills Reserved Forest
11. Tura Peak Reserved Forest
12. Baghmara Reserved Forest
13. Angratoli Reserved Forest
14. Rewak Reserved Forest
15. Emangiri Reserved Forest

KHASI HILLS AND RI BHOI DISTRICTS

1. Riat Khwan Reserved Forest
2. Shyrwat Reserved Forest
3. Riat Laban Reserved Forest
4. Nongumiang Reserved Forest
5. Nongkhyllem Reserved Forest
6. Umsaw Reserved Forest

JAINTIA HILLS DISTRICTS

1. Saipung Reserved Forest
2. Narpuh Reserved Forest Block-I
3. Narpuh Reserved Forest Block-II

PROTECTED FORESTS & GREEN BLOCKS (EAST KHASI HILLS AND RI BHOI DISTRICT)

1. Upper Shillong Protected Forests
2. Short Round Protected Forests
3. Laitkor Protected Forests
4. Umkhuti Protected Forests
5. Green Block No. 2



According to the Champion and Seth Classification of Forest Types which are mainly based on Eco-Systems, with sufficient weightage given to both vegetation and climate. The forests of Meghalaya fall under 5 major Groups:-

(i) Tropical Forest;
(ii) Montane Subtropical Forests;
(iii) Montane Temperate Forests;
(iv) Sub-alpine Forests; and
(v) Alpine scrub.

The major groups have further been divided into Type Groups or , simply, Groups on the basis climatic data and vegetation.

1. The Tropical forests which is further divided into 7 groups,
2. Montane subtropical forests which is further divided into 3 groups,
3. Montane temperate forests which is further divided into 3 groups,
4. Sub-alpine forests into 1 group and
5. Alpine scrub which is further divided into 2 groups.



The forests of Meghalaya can be classified into the following types :

(a) **Tropical Wet Evergreen Forest : Cachar Tropical Evergreen Forest.** These type of forests can be found on the upper slopes of the Khasi, Jaiñtia Hills. The main tree species are *Artocarpus chaplasha, Artocarpus integrifolia, Alstonia scholaris, Amoora wallichii, Anthocephalus cadamba, Amoora rohituca, Betula alnoides, Bauhinia variegata, Castanopsis indica, Chukrasia tabularis, Duabanga indica, Michelia champaca, Schima wallichii, Terminalia bellerica.*



(b) **Northern Tropical Semi-Evergreen Forests** – These type of forests can be found in the Garo, Khasi & Jaiñtia Hills region. The principal tree species are *Terminalia bellarica, T.chebula, Artocarpus chaplasha, Artocarpus integrifolia, Albizia lebbeck, Albizia procera, Amoora wallichi, Trewia nudiflora, Tetrameles nudiflora, Toona ciliata, Dellimia pentagyna, Sterculia villosa, Duabanga indica, Dyxoxyllum, Michellia champaca, M. panduana, vitex peduncularis, Lagerstroemia parviflora, Gmelina arborea, Adina cordifolia.*



(c) **North Indian Tropical Moist Deciduous Forests** – These forests occur mainly in Garo hills and Khasi Hills region. The main tree species are Sal besides other principal tree species; *Schima wallichii, Lagerstroemia parviflora, Terminalia belerica, Gmelia arborea, Toona ciliata, Stereospermum chelonoides, Dillenia pentagyna, Sterculia villosa, Vitex penduncularis, Careya arborea, Bauhinia retusa, Syzizium cuminii,* etc.



(d) **Northern Subtropical Broad-leaved Hill Forest :** Khasi Sub-tropical Wet Hill Forest. These type of forests are found mostly in Khasi Hills, Jaiñtia Hills and part of Eastern Garo Hills region. The main tree species forming the upper two canopies are *Quercus serrata, Quercus griffithii, Beilschmiedia, Schima wallichi, Engelhardtia spicata, Lindera spp, Ilex khasiana, Pyrus pashia, Myrica esculanta,* etc.



(e) **Subtropical Pine Forest : Assam Sub tropical pine forest** - This type of forest occurs in the Khasi & Jaiñtia hills region which consist of pine (*Pinus khasiana*) and broad leaves species of *Castanopsis indica, Schima wallichii, Myrica esculanta, Wendlandia grandis, Quercus serrata, Quercus griffithii, Engelhardtia spicata, Rhus semicordata, etc.*



(f) **East Himalayan Wet Temperate Forests** – These type of forests are found above 1000 m in the Khasi and Jaintia Hills, mostly along the southern slopes. The main species are *Magnolia campbellii, Michelia champaca, Michelia panduana, Quercus griffithii, Quercus serrata, Acer oblongum, Pyrus pashia, Exbucklandia populnea, Alnus nepalensis, Betula alnoides, Carpinus indicum, Rhododendron arboreum, with undergrowth of bamboo, fern* etc.



Ecological SERVICES



Reserved Forests around Shillong Peak

Sunderlal Bahuguna, the noted environmentalist in his quote said, "They say the trees are unproductive until they are cut; that the land is needed for development. What is development? For most of us development means affluence. You have to produce more and more things for your luxury and comfort. Ultimately this tells on your resources because everything has to come from nature. You have to decide whether development means affluence or whether development means peace, prosperity, and happiness."

Forests are the sources of livelihood and provide clean air, water and raw material for food and shelter.

Clean Air (Oxygen)

Oxygen is essential for survival of all life forms and forests are the main source of oxygen. They act as the lungs of the earth taking in carbon dioxide and releasing oxygen. The ecological services provided by the forests invaluable, however, it is not easy to quantify them.



Forests of Tura Peak

Water

Forest soils hold water well, releasing it slowly into the local streams and rivers evenly throughout the year.



Perennial water bodies inside Nongkhyllem Wildlife Sanctuary





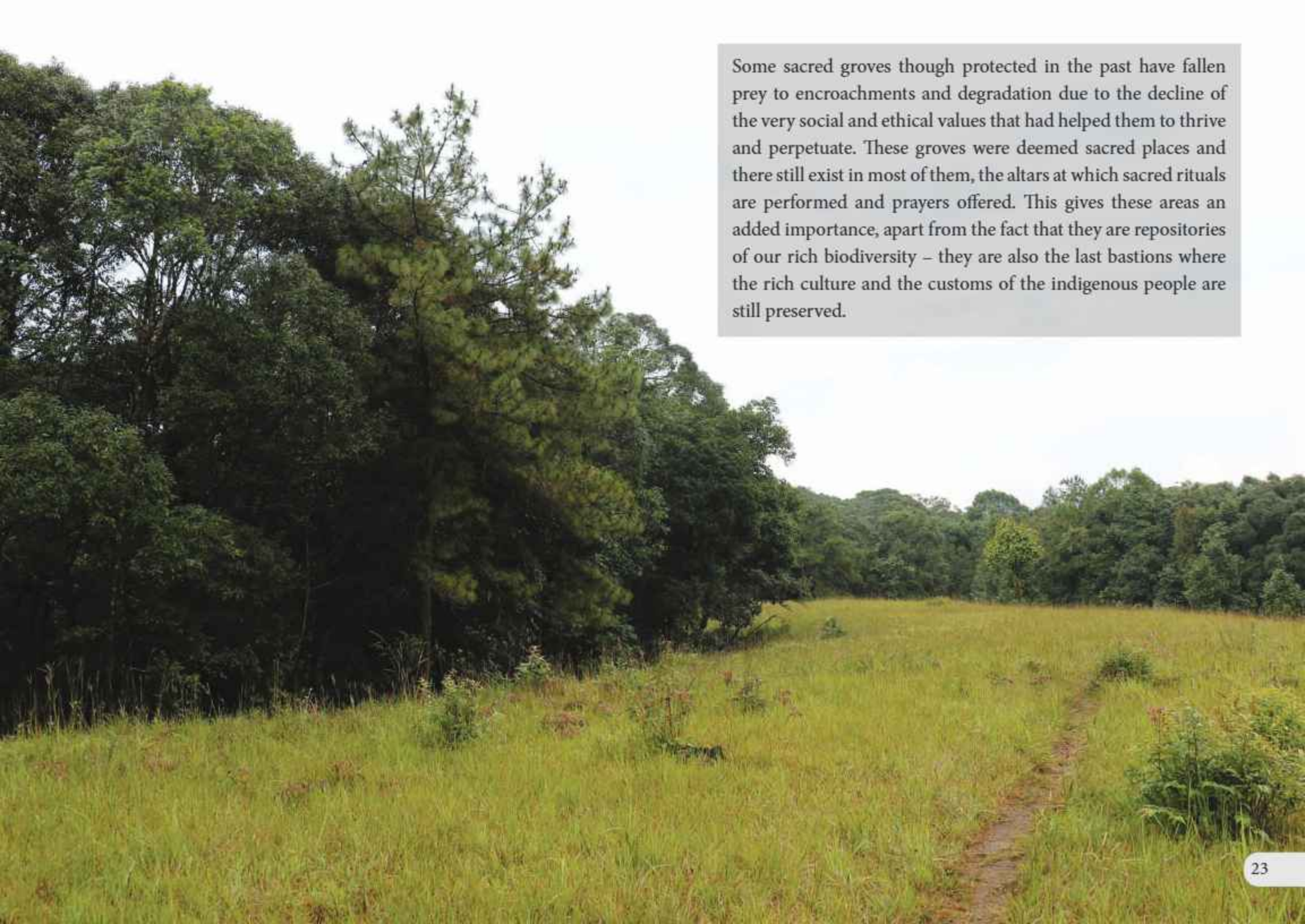


Sacred Groves

Sacred groves are tracts of virgin forests that have cultural or religious significance for the people who live around them. They have been protected by local communities for a variety of reasons, as water sources, burial grounds & sites for religious ceremonies. As a result the rich biodiversity of these forests are well preserved. In Meghalaya, sacred groves represent an age old tradition of environmental conservation based on indigenous knowledge by the local tribal communities. They are among the few undisturbed forest patches which serve as the natural treasure house of biodiversity and a store house for a large number of endemic, endangered and rare species. The general term for sacred groves in the Khasi Hills is 'Khlaw Kyntang' or 'Law Kyntang' or 'Law Lyngdoh' while in the Jaintia Hills it is 'Khloo Blai'. The sacred groves in the Khasi Hills and Jaintia Hills District are fundamentally based on the traditional religious beliefs of the local tribals i.e., Khasis and Pnars. According to them a forest deity called 'Ryngkew', 'Basa' or 'Labasa'(in the local language) resides in these sacred groves which protects and provide for the well-being of the village community. In these forests, the cutting of trees, plucking of flowers or fruits or leaves & twigs are prohibited and it is believed that such acts would offend the deity and bring harm to the perpetrators. Various rites and rituals are performed periodically in these forests. The sacred groves in Garo Hills are known as "A·song kosi".

So far 125 Sacred Groves have been surveyed and mapped by the Meghalaya Forest Department.





Some sacred groves though protected in the past have fallen prey to encroachments and degradation due to the decline of the very social and ethical values that had helped them to thrive and perpetuate. These groves were deemed sacred places and there still exist in most of them, the altars at which sacred rituals are performed and prayers offered. This gives these areas an added importance, apart from the fact that they are repositories of our rich biodiversity – they are also the last bastions where the rich culture and the customs of the indigenous people are still preserved.



Mawphlang Sacred Grove





TUBER SACRED GROVE





RELIGIOUS CEREMONY BEING CONDUCTED AT THE GROVES

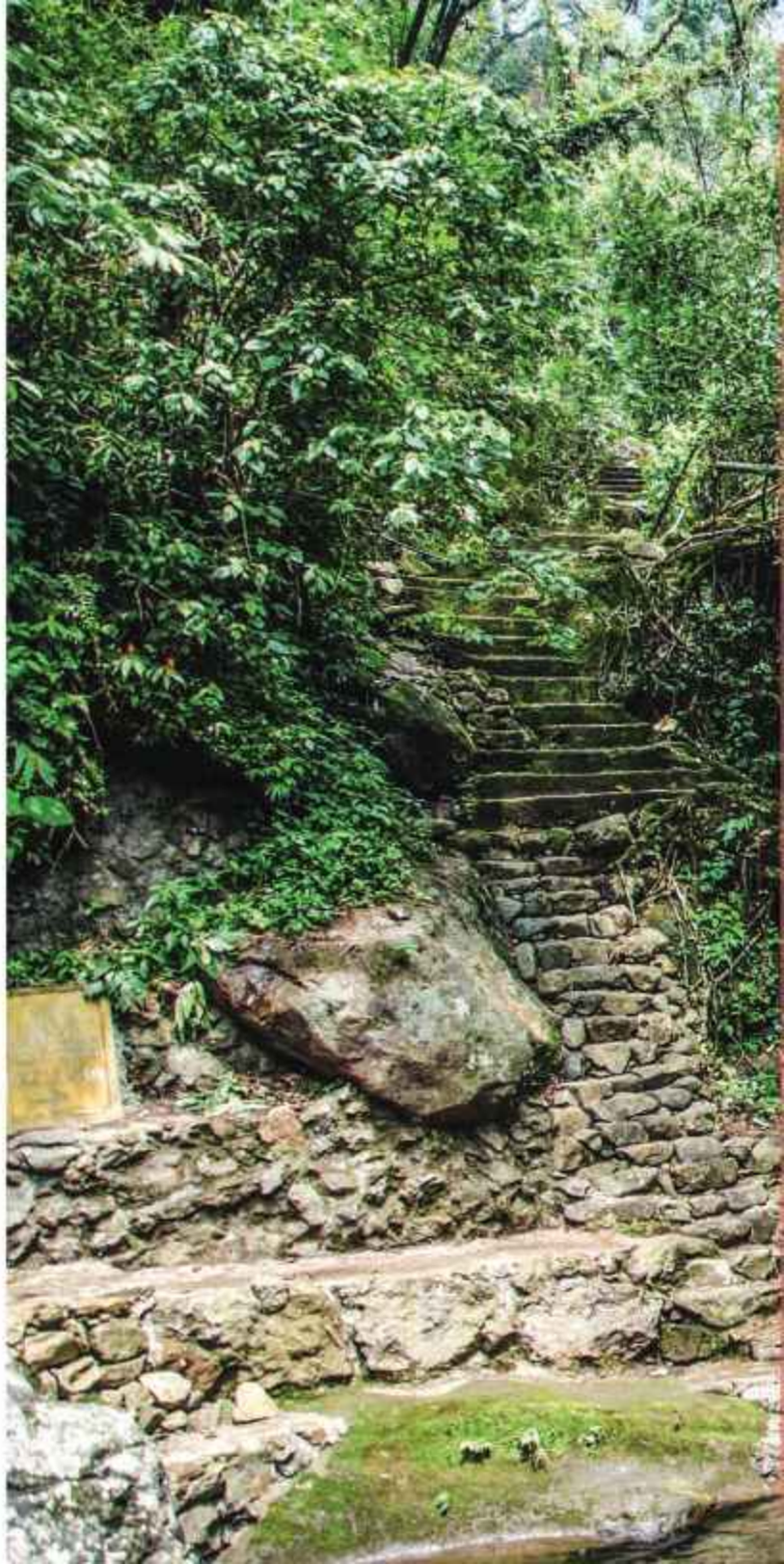
Living Root Bridge

Meghalaya's single and double-decker root bridges are unique and a sight to behold. The bridges are tangles of massive thick roots, that have been trained to grow across streams and rivers to form strong bridges. The living bridges are made from the roots of the *Ficus elastica* tree, the Rubber Tree which produces a series of secondary roots that are perched atop huge boulders along the streams or the riverbanks to form bridges.

The root bridges, some of which are over a hundred feet long, take ten to fifteen years to become fully functional. They are extraordinarily strong – and can support the weight of fifty or more people at a time. The bridges are alive and still growing and gaining strength over time.



SINGLE DECKER LIVING ROOT BRIDGE IN MAWLYNNONG





DOUBLE DECKER LIVING ROOT BRIDGE AT NONGRIAT



Tiew Jahkhei
(*Strobilanthes tomentosa*)

Strobilanthes tomentosa

A RARE PHENOMENON OF FLOWERING ONCE IN 12 YEARS

Scientific Name :	*Strobilanthes tomentosa* (Nees) J.R.I.Wood
Local Name :	Tiew Jah Khei (Khasi) and Tiewla-Khi (Jaintia)
Distribution in India :	E- & NE-India, Himalayas, Jammu, Punjab plains, Upper Gangetic Plains.
Distribution in Meghalaya :	Khasi and Jaintia Hills (Mawpyrshong, Sung valley, Puriang, Khlieh Tyrsi, Mih Myntdu, Kut, Shangpung, Mynso, Raliang).
Description :	A small erect shrub up to 1 m tall which flowers once in every 12 years. This unique plant belongs to family Acanthaceae.
Flowering and Fruiting :	August - October and November - December. The last bloom was recorded in 2015.
Habitat :	Grassy mountain slopes, open forests in relatively dry areas. The plant prefers well drained soils.
Threats :	Shifting cultivation and suppression by dominant and aggressive shrubs primarily *Lantana camara*.

Cave Biodiversity

Caves are nature's work of art. Meghalaya boasts of a large number of caves and is a cavers' paradise. Caves are normally formed in sedimentary rocks, especially limestone. Meghalaya has an extensive (approximately 300 km) long belt of diverse sedimentary rocks. The Khasi Hills, Jaintia Hills and the Garo Hills all have their fair share of caves. Many of the caves have been mapped and studied. Krem LiatPrah, located in the Jaintia Hills is the longest cave in the Indian Subcontinent with a mapped length of 22.2 Km. Synrang Pamjang, the deepest cave in India (317 m) is also located in the State. Mawsmai cave is the most accessible cave for tourists. Many of the caves present impressive formations of large passages, chambers, waterways, stalacmites and stalagtites.

A variety of species of spiders, pseudoscorpions, millipedes, crickets, cockroaches, beetles, flies, crabs, shrimps, crayfish and Blind fish are found in these caves. The biggest threat to the cave ecosystem in Meghalaya is stone quarrying.



Otomops nesting inside a cave



Blind fish (*Schistura*)



Otomops wroughtoni



SYNDAI CAVE
WEST JAINTIA HILLS

Mammalian Diversity

Mammalian Diversity is evident with about 139 species and sub-species belonging to 83 genera and 27 families.

Primates : Meghalaya harbours 7 species of Primates. The Western Hoolock Gibbon, *Hoolock hoolock*, one of the only two true ape species of India, is found in the Tropical Evergreen Forests. The Hoolock Gibbon is classified as Endangered (EN) on the IUCN Red List and on Appendix I of CITES. It is listed in Schedule I in the Wildlife (Protection) Act, 1972. The Bengal Slow Loris, *Nycticebus bengalensis* is the only nocturnal primate of Meghalaya and is the largest of the slow loris species. It is listed under Vulnerable category by IUCN. It is placed in Schedule I of the Indian Wildlife (Protection) Act 1972, and is also in Appendix I of CITES. The Capped Langur, *Trachypithecus pileatus* is found in dense forests as well as light woodlands in the State. The State has four more primates, all macaques – Northern Pig Tailed Macaque, *Macaca leonina*, Rheus Macaque, *Macaca mulatta*, Assamese Macaque, *Macaca assamensis* and Stumped Tailed Macaque, *Macaca arctoides* - the rarest of all now confined to the Narpuh, Nokrek and Balpakram wildlife protected areas.

Carnivores : The state has three of the six largest cats recorded in the world - the Tiger (*Panthera tigris*), Leopard (*Panthera pardus*), and the Clouded Leopard (*Neofelis nebulosa*). Meghalaya's pride is its state animal, the beautiful and rare Clouded Leopard. Other small cats are the Jungle Cat (*Felis chaus*), Marbled cat (*Pardofelis marmorata*), Asiatic Golden Cat (*Catopuma temmincki*), Leopard Cat (*Prionailurus bengalensis*).The State is also home to three species of bears, the Asiactic Black Bear (*Selenarctos thibetanus*), Malayan Sun Bear (*Helartos malayanus*) and the Sloth bear (*Melursus ursinus*).

The Red Panda (*Ailurus fulgens fulgens*) is found in the state and is known as Mitchebel by the Garos and as Dkhan-bah by the Khasis. It is placed in Schedule I of the Indian Wildlife (Protection) Act, 1972 and listed in Appendix I of CITES and considered Endangered, by IUCN.



Hoolock Gibbon
(*Hoolock hoolock*)



Slow Loris
(*Nycticebus bengalensis*)

Smaller carnivores found in Meghalaya include Asiatic Jackal (*Canis aureus*), Bengal Fox (*Vulpes bengalensis*), the Dhole or Indian Wild dog (*Cuon alpines*), Yellow Throated Marten (*Martes flavigula flavigula*), Yellow Bellied Weasel (*Mustela kathiah*), Burmese Ferret Badger (*Melogale personata nipalensis*), Hog Badger (*Arctonux collaris*), Common Otter (*Lutra lutra monticola*), Smooth-coated Indian Otter (*Lutra perspicillata perspicillata*), Oriental Small-clawed Otter (*Aonyx cinerea concolor*), Large Indian Civet (*Viverra zibetha zibetha*), Small Indian Civet (*Viverri culaindica*), Common Palm Civet (*Paradoxurus hermaphrodites*), Masked Palm Civet (*Paguma larvata neglecta*), Binturong (*Arctictis binturong*), Small Indian Mongoose (*Herpestes auropunctatus*), Indian Grey Mongoose (*Herpestes edwardsi*) and Crab Eating Mongoose (*Herpestes urva*).

There is only one species of pangolin in the State, viz. the Chinese Pangolin (*Manis pentadactyla*) which is listed under Endangered category according to IUCN and is also a Schedule I animal of the Indian Wildlife (Protection) Act 1972. It is also listed in Appendix II of CITES.

Meghalaya supports a large population of the Asian Elephant (*Elephas maximus*). The globally endangered Indian Wild Water Buffalo (*Bubalus arnee*) is still found in small groups of 10 to 20 in the Balpakram-Siju-Baghmara belt and adjacent areas including parts of the West Khasi Hills.

Ungulates that have become threatened and rare include the Himalayan serow (*Capricornis thar*), The Garol (*Naemorhedus goral*), Gaur-Indian Bison (*Bos gaurus*), Hog Deer (*Axis porcinus*) and Sambar (*Rusa unicolor*) . Barking Deer (*Muntiacus muntjak*) and Wild Boar (*Sus scrofa*) are still found in plenty.



Avian Diversity

India is rich in birdlife with a total of 1167 species including 80 globally threatened birds and 49 endemic species. The country has 465 Important Bird Areas and is a part of 12 Endemic Birds Areas.

Despite its relatively small size, Meghalaya is rich in bird life harbouring about 659 species of birds. 34 species of the birds found in our forests are globally threatened species. Meghalaya lies in the Eastern Himalayas (Endemic Bird Area 130) (Statterfield et al. 1998). The region is important for many globally threatened, near threatened and restricted range species.

Reptilian Diversity : The reptile fauna of Meghalaya is greatly influenced by the Indo-Chinese elements. The State boasts of 12 species of turtles and tortoises, 26 species of lizards and 56 species of snakes.

The Assam roofed turtle *Pangshura sylhetensis* was first reported in the Khasi Hills and is one of Asia's Most Endangered Tortoises and Freshwater Turtles. Most of the turtles and tortoises in Meghalaya are threatened with 5 species listed as Endangered, 1 species as Near Threatened, 4 species as Vulnerable and 2 species as Least Concern (IUCN Category 2014). 26 species of lizards have so far been recorded from the State. All the 3 species of monitor lizards found in the State are listed under Schedule I (Part II) of the Wildlife (Protection) Act, 1972. The Tokay Gecko (*Gekko gecko)* which is one of the largest Geckos alive today is also found in the state. Another rare lizard is the *Calotes maria* which is found only in Mizoram and Meghalaya

Snakes : Meghalaya has numerous species of snakes, numbering 56. Some of the common snakes are Brahminy Blind Snake *Indotyphlops braminus*, Assam Snail Eater *Pareas monticola*, Copperhead Rat Head *Coelognathus radiatus* and the Indian-Chinese Rat Snake *Ptyas korros*. The world longest venomous snake 'The King Cobra' *Ophiophagus hannah* is also found in the State.

Amphibians Diversity : North East India has an abundant variety of amphibians Meghalaya alone harbours around 33 species. *Bufoides meghalayanus* and *Philautus shillongensis* are two frog species that are rare and threatened and endemic to Meghalaya. Some of the very rare and elusive frogs found in the state are *Philautus cherrapunjiae, Rana mawlyndipi, Rana mawphlangensis, Hyla annectans* and *Microhyla berdmorei* etc.

Pisces Diversity : Meghalaya has two major drainage systems, the Brahmaputra in the North and Barak in the South. Because of the topography and water shed pattern the state of Meghalaya is rich in fish diversity with about 152 species reported so far. *Neolissochilus hexagonolepis* and *Tor* species are the important sport fishes inhabiting the fast flowing rivers and streams of the State. 29 species of the fish found in the State are threatened in one way or the other.

Molluscs : A total of 223 species of land and freshwater molluscs spread over 67 genera and 28 families are found in Meghalaya. Fresh water molluscs are represented by 35 species, 15 genera and 10 families.



Choaspes benjaminii (Indian Awlking)



Meandrusa payeni (Yellow Gorgon)



MEGHALAYA BIODIVERSITY BOARD :

For implementation of the Biological Diversity Act (BDA), a three tier institutional structure has been put in place in India *viz.*, **National Biodiversity Authority (NBA)**, **State Biodiversity Boards (SBB)**, and **Biodiversity Management Committees (BMCs)** functioning at the National, State and local levels. All these are **statutory bodies**. The **Meghalaya Biodiversity Board (MBB)** was established in 2010. The Board is working to achieve three main objectives, *viz.*, **conservation of biological diversity**, **sustainable use of its components** and **fair and equitable sharing of benefits** arising out of use of biological resources.

BIODIVERSITY MANAGEMENT COMMITTEES:

BMCs have been constituted under Section 41(1) of the Biological Diversity Act 2002 and Rule 23(1) of the Meghalaya Biological Diversity Rules 2010 as amended in 2015. The Board is continously facilitating constitution of BMCs by all local bodies and at present 189 BMCs have been formed in all the village Dorbars.

BMCs are vital statutory bodies operating at the grass-root level to achieve the objectives of the Biodiversity Act. The primary responsibility of these BMCs is to create a database of the biological resources available in their villages and related traditional knowledge, in the form of 'People Biodiversity Register' (PBR). They are also expected to monitor and control access to biological resources under their jurisdictions. In this regard, they are legally empowered to levy access fees also. They are expected to offer advices to the NBA and SBB on matters of access, biodiversity conservation and sustainable use. They are expected to take steps in protecting the biodiversity in their jurisdiction.

For funding technical assistance to the BMCs, Technical Support Groups (TSG) have been notified for each District by the Government. One Divisional Forest Officer has been nominated per district as the District Nodal Officer cum Convener of the TSG.



Dendrobium densiflorum

Meghalaya is well known for its floral wealth and has attracted many botanists. The presence of a large number of primitive flowering plants has prompted Takhtajan (1969) to call it the 'Cradle of Flowering Plants'. The State harbours about 3,128 species of flowering plants and contributes about 18% of the total flora wealth of the country, including 1,237 endemic species (Khan *et al.* 1997). A wide variety of wild cultivable plants, edible fruits, leafy vegetables and orchids are found in its natural forests.

The North East region is a store house of many botanical curiosities and botanical rarities. Amongst insectivorous plants *Nepenthes khasiana* Hk. f. and two species of *Drosera* i.e, *Drosera peltata* Sm. and *Drosera burmanii* Vahl. are considered important. *Nepenthes khasiana* is endemic to Meghalaya and listed in Appendix I of CITES and placed in Schedule VI of the Wildlife (Protection) Act, 1972. The Khasi and Jaintia Hills region are considered to be the centre of diversity for several primitive families such as Elaeocarpaceae, Elaeagnaceae, Anonaceae, Ranunculaceae, Piperraceae, Menispermaceae, Caryophyllaceae, Lauraceae, Myricaceae, Lazarbiaceae and primitive genera like *Sarcandra*, *Corylopsis*, *Myrica*, *Magnolia* and *Michelia*.









The Pitcher Plant

Scientific name: *Nepenthes khasiana*

English/Local name: Pitcher Plant (English), Tiew Rakot (Khasi)

The only pitcher plant found in India and is endemic to Meghalaya belonging to the family Nepenthaceae. It is a straggling scandent insectivorous shrub growing in the undisturbed subtropical and tropical forests of the State at elevations ranging from 1000-1500 m.

The fluid in the unopened pitcher is used to treat eye, digestive and urinary ailments; for diabetes and for female diseases. The pitcher with its contents is made into a paste and applied on affected parts of leprosy patients.

Most pitcher plant habitats have been destroyed. Indiscriminate collection is also a major cause of severe decline in populations. Various in-situ and ex-situ measures have been implemented by the Forest Department. Some populations of *N. khasiana* are now permanently protected, in the Baghmara Pitcher Plant Sanctuary in South Garo Hills District and in the Pitcher Plant Lake in Jarain, Jaintia Hills District.



Status:
The pitcher plant is placed in the Critically Endangered (B1, 2C) IUCN status category and is also in Appendix 1 of CITES. The species also figures in Scheduled VI of the Wildlife (Protection) Act of 1972.

Conservation measures taken:
Efforts have been made to conserve this rare and critically endangered plant throughout the State. A survey was carried out 2 (two) years i.e. 2010 to 2012 to map the distribution of Nepenthes khasiana in the State. Fire protection measures have been initiated in fire prone areas during the dry months. The Department has also been able to standardize Micro-propagation techniques and the hardened in-vitro seedlings have been planted at several places for ex-situ conservation like Umkhuti, Mawsmai cave and Laitkynsew.

Tree Species

The diverse topography, varying climatic conditions, well distributed and abundant rainfall and availability of deep, well drained, nutrition-rich fertile soils in the State favors high species diversity and supports different types of forests.

Deciduous and Evergreen Tropical forests, Sub-Tropical Semi Evergreen and Sub-Tropical Pine forests are the major Forest types that thrive in the State.

Ten of the most important tree Species are described in the following pages.



Scientific name: *Gmelina arborea* Roxb.

Family: Verbenaceae

Vernacular name: Dieng laphiang (K), Gomari (A); White teak (Eng.).

Distribution in Meghalaya: The species is found in the open deciduous forests of Ri-Bhoi and Garo Hills districts.

Description: *Gmelina arborea* Roxb is one of the important medicinal plants most widely propagated and cultivated species of the family Verbenaceae. It is one of the herbs mentioned in all ancient scriptures of Ayurveda. The plant is a fast-growing, deciduous tree that can grow up to 30 m in height. A medium-sized tree up to 30m tall; bole with average diameter 50 cm but sometimes reaching 140 cm. The bark is smooth or scaly, pale brown to grey. The twigs are glabrous or pubescent. Flowers of bright yellow colour, arranged in large, terminal panicles (30-350 flowers in each).

Flowering and fruiting: February – April and May – June

Uses: This plant is planted in gardens and also as an avenue tree. The wood is used mainly for light construction and for pulp. Different parts of the plant can be used medicinally like root, fruit, leaf, flower and bark. It is extensively used traditionally as antihelmintic, antimicrobial, antidiabetic, diuretic, hepatoprotective and antiepileptic agent.



Scientific name: *Myrica esculenta*

Common name: Box myrtle

Local name: Dieng Sohphi

Family: Myricaceae

Nature: It is a small tree or a large shrub native to hills of Northern India and Nepal.

DistributionThis species is globally distributed across Indo-Malaysian region. Within India, it has been recorded in Jammu & Kashmir, Himachal Pradesh, Uttar Pradesh, Sikkim, Arunachal Pradesh, Assam, Meghalaya, Nagaland, Manipur and Mizoram between an altitude ranges of 1000-2300 m.

Propagation: It is done through seeds, suckers and layering.

Uses: According to Ayurveda, it has two varieties based on the color of flower: Shwet (white) and Rakta (red). It is used in treating wounds, musculoskeletal disorder and disease of oral cavity. The fruit has a very good medicinal value in case of stomach disorder.



Botanical name: *Prunus cerasoides*
Common name : Wild Himalayan Cherry
Local name: Diengsohiongkrem
Family: Rosaceae
Nature: Tropical deciduous tree attaining a height of 10-15m.
Distribution: it is distributed in Khasi Hills of Meghalaya, Manipur and also in sub montane and montane Himalaya, Sikkim, Nepal, Bhutan, Myanmar and West China. In Garhwal hills, it is common in oak forests and edges of crop fields from sub Himalayan tracts to montane zones.
Propagation: Naturally it regenerates profusely through seeds but it needs adequate moisture for growth and survival. Wild animals and birds dispersed the seeds to a reasonable distance. Arificially it can be raised by direct sowing or transplanting of seedlings.
Uses: The fruits gives a dark green dye and the seeds are used in the manufacture of necklaces. The wood is hard, strong, durable and branches are used as walking sticks.



Scientific Name: *Betula alnoides* Buch.-Ham.

Family: Betulaceae

Vernacular Name: Dieng ling (K), Bol Nangal (G)

Distribution in Meghalaya: Common throughout Meghalaya at higher elevations, often gregarious.

Description: A lofty tree of around 20-30 m. height easily distinguishable by the horizontal peeling of the bark.

Flowering and fruiting: April to August

Propagation: By seeds and cuttings

Uses: The timber is excellent for making cabinets, turnery spools, pill boxes, tool handles, planks, plywood, veneers and particle boards.



Scientific Name: *Chukrasia tabularis* A.Juss.

Family: Meliaceae

Vernacular Name: Bol-dorck, Chuma (G), Dieng Dkhar bti (K)

Distribution in Meghalaya: Found in evergreen forests in the Garo Hills and Ri-Bhoi districts.

Description: A handsome deciduous, lofty tree growing up to 40 mts. The tree is branchless up to 18 m. with a diameter of around 110 cm. The wood is hard reddish brown with a satiny lustre.

Flowering and fruiting: May to March.

Propagation: By seeds.

Uses: The timber is highly prized for cabinet making, panelling and is also suitable for planking and furniture. The bark possesses astringent properties.



Scientific Name: *Magnolia grandiflora* (L.) Baill.ex Pierre

Family: Magnoliaceae

Vernacular Name: Bol-Nabat (G); Diengrai (K)

Distribution in Meghalaya: Occurs sporadically at lower elevations in the Garo Hills, Ri-Bhoi, East and West Khasi Hills districts.

Description: Usually a mid size evergreen tree attaining a height of up to 50 m or more with a straight cylindrical bole. This tree is widely cultivated for it fragrant flowers.

Flowering and fruiting: June – July

Propagation: By seeds

Uses: The wood is well figured and very durable. It seasons and polishes well and is used for furniture making, carvings, turnery and pattern making.



Scientific Name: *Schima wallichii* Choisy

Family: Theaceae

Vernacular Name: Noga-bhe (A); Dieng Shyrngan; Diengngan; Dieng Nganbuit (K) , Dein ngan (Jaintia)

Distribution in Meghalaya: Throughout Meghalaya in all types of forests.

Description: *Schima wallichi* is an evergreen, medium-sized to large tree growing to 47 m in height. The bole is cylindrical and branchless for up to 25 m. The tree attains a diameter of around 125 cm, with steep buttresses up to 1.8 m high The bark surface is ruggedly cracked into small, thick, angular pieces and is red-brown to dark grey in colour. The inner bark has skin-irritating fibres and is bright red in colour.

Flowering and fruiting: February to January in the following year.

Propagation: By seeds

Uses: It is one of the most valued tree species for manufacturing high quality plywood. The wood is moderately durable, hard and fairly strong.



Scientific Name: *Toona ciliata* M.Roem.

Family: Meliaceae

Vernacular Name: Poma (A); Diengbti (K)

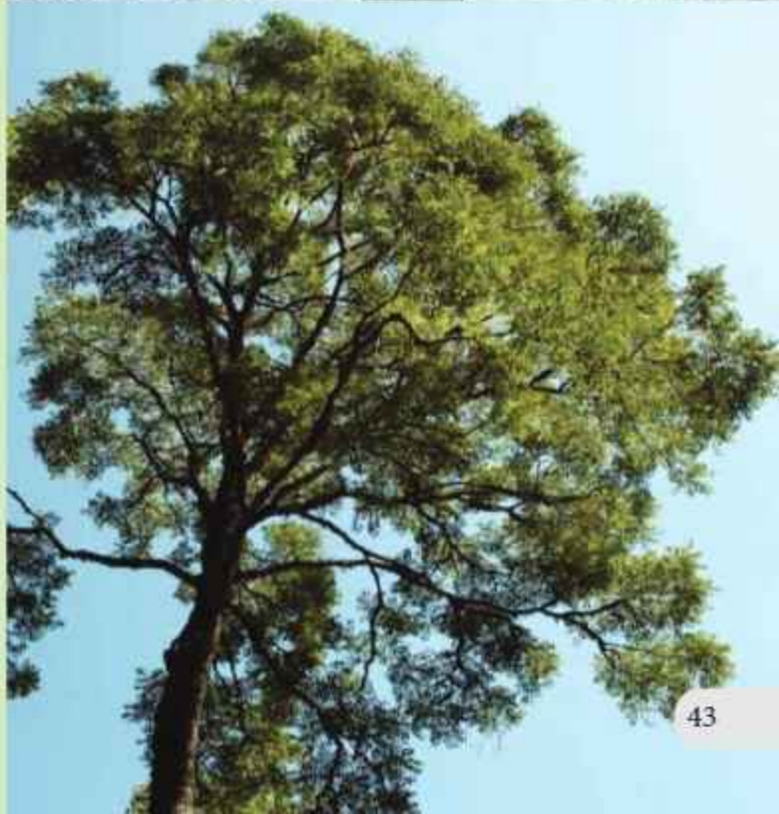
Distribution in Meghalaya: Very common in deciduous and mixed deciduous forests.

Description: A large deciduous tree with a spreading crown, commonly attaining a height of 20-30 m and a girth of 1.8-3 m. the bark is dark grey or reddish-brown, smooth upto middle age, afterwards rough, with shallow reticulate cracks exfoliating in irregular woody scales.

Flowering and fruiting: November-September

Propagation: By seeds

Uses: The wood has a variety of uses such as for boat building, furniture making, manufacture of decorative plywood and veneer. It is also used as a building material, for making food containers, musical instruments, panelling, boxes and crates.



Scientific Name: *Tetrameles nudiflora* R.Br.

Family: Tetramelaceae

Vernacular Name: Bol-bok (G); Diengsarat, Dieng taro (K)

Distribution in Meghalaya: This species occurs in open deciduous forests in Ri-Bhoi and the Garo Hills districts.

Description: A large, buttressed, deciduous tree, growing up to 40 m tall with a spreading crown and a straight bole. The bark is shiny in young trees, and horizontally wrinkled. It is a fast growing tree, easily distinguishable due to its towering size and nodding branches.

Flowering and fruiting: March-June

Propagation: By seeds, vegetative propagated by shoot cutting.

Uses: the wood is used in the match industry, making of boxes and crates and core stock for plywood.



Scientific Name: *Pinus kesiya Royle* ex Gordon

Family: Pinaceae

Vernacular Name: Dieng Kseh (K)

Distribution in Meghalaya: Dominant tree species in subtropical pine forests in the state.

Description: Tall trees measure up to 45 metres in height with a bole free of branches for upto 15 to 20 metres. The bark is thick, reticulated and deeply fissured. Bright grass green needles occur in bundles of 2 to 3 they are very slender and flexible and grow to around 25 cm length.

Propagation: By seeds.

Uses: The tree produces oleoresin which yields superior quality Turpentine oil, and golden-yellow resin. Bark contains tannin. The wood used for indoor constructions, and board wood suitable for planking and making packing cases.



Bamboos



Introduction

Bamboo is an important resource in our socio-economic and cultural context. It is a fast growing, widespread, versatile and an environment friendly resource. Apart from its traditional uses, bamboo has various new applications as an alternative to our rapidly depleting wood resources and is a viable option to many other expensive construction and furnishing materials. Bamboo is an ideal species for achieving conservation of soil and moisture, restoration of degraded land, livelihood and economic security because of its manifold uses and industrial applications. It therefore deserves to be developed as an economic and environment resource.

Meghalaya is richly endowed with bamboo forests. Its abundance and multiple uses have led bamboo to play a pivotal role in the socio-economic and cultural life of the tribal people of the state.

Bamboo forests in the state have diverse species base which include clump forming as well as non-clump forming types. It has been reported that 36 species of bamboo from 14 genera are found in Meghalaya (Biswas, 1988).





Bamboo Forest in Lawsohtun

The state harbours 44 species of Bamboos. Some of the rare species found in the State are

Bambusa khasiana, Bambusa nutans, Bambusa pseudopallida, Chimonobambusa callosa, Dendrocalamus longispathis, Gigantochloa andamanica, Cephalo stachyummannii, Sinarundinaria *hirsute* and Sinarundinaria polystachya.

The Forest Department has established two bambusetums at Lumsohpetbneng in the East Khasi Hills District and at Rongrengiri in the East Garo Hills District. A standardised tissue culture protocol has been established for the following bamboo species for the mass multiplication:-

1) *Bambusa nana*
2) *Bambusa tulda*
3) *Dendrocalamus hamiltonii*
4) *Dendrocalamus strictus*

Bamboo belongs to the grass family Poaceae (Gramineae) and is considered the fastest growing plant on earth. Around 75 genera and 1250 species of bamboo are known to exist throughout the world. About 66% of the growing stock is estimated to be concentrated in the North Eastern states of the country. Meghalaya harbours over 37 species belonging to 14 genera. Some of the important species are *Bambusa balcooa* Roxb., *Bambusa cacharensis* Majumdar., *Bambusa jaintiana* Majumdar, *Dendrocalamus hamiltonii* Nees et Arn. Ex Munro, *Dendrocalamus hookeri* Munro, *Dendrocalamus longispathus* (Kurz) Kurz., *Dendrocalamus sahnii* Naithani & Bahadur, *Dendrocalamus sikkimensis* Gamble, *Phyllostachys mannii* Gamble and *Pseudostachyum polymorphum* Munro, etc.

Most important and commonly used bamboo in the state includes the following ten species.



Scientific Name: *Bambusa balcooa* Roxb

Local Name: Borua (Garo)

Locality: East Khasi Hills: Mawdon
East Jaintia Hills: Umkiang
South Garo Hills: Chambalgiri, Barangapara

Uses: As a building materials for houses, scaffolding, bridges, fishing floats, baskets, floor mats and for making agricultural and fishing implements. As raw material for the wood chip and paper pulp making. Its shoots are consumed as vegetables and leaves are used as cattle fodder.



Scientific Name: *Bambusa jaintiana* Majumdar

Local Name: U Shken (Khasi), Shken Pnar, Thning (Jaintia), Wathibok, Kolongki (Garo)

Locality: Common throughout Meghalaya

Uses: Mainly for basket and mat making



Scientific Name: *Dendrocalamus hamiltonii* Nees et Arn. Ex Munro

Local Name: Siejlieh (Khasi), Syrtieh (Jaintia), Wanok (Garo)

Locality: Common throughout Meghalaya

Uses: Used for walling of native huts, basket making, mats and ropes, it produces the most sought after edible young shoots.



Scientific Name: *Dendrocalamus hookeri* Munro

Local Name: Siejiong, Skong (K)

Locality: East Khasi Hills: Upper Shillong, Mairang, Sohryngkham, Cherrapunji.
West Khasi Hills: Nongstoin, Riwiang
East Jaintia Hills: Saabahmu Swans, Khliehtyrshi
Mawkyrwat District: Village Photdgi, Village Mawsaw Domshrah, Mawrangland.

Uses: Used for walling of native huts, basket making, matsand ropes, it produces best quality edible young shoots.



Scientific Name: *Dendrocalamus longispathus* (Kurz) Kurz.,

Local Name: Siejiong (K)

Locality: East Jaintia Hills, Umkiang, Jaintia Hills.

Uses: Used for Construction, thatching and roofing, making of mats and baskets, , floats for timber and rafts, chinks for door and windows and craft paper.



Scientific Name: *Dendrocalamus sahnii* Naithani & Bahadur

Local Name: Tawang (K)

Locality: East Khasi Hills: 4th Mile, Upper Shillong and Mr. Khongsit House, Sanmer, Upper Shillong, Mawphyllud, West Khasi Hills

Uses: Used for making baskets and mats and for fencing.



Scientific Name: *Dendrocalamus sikkimensis* Gamble

Local Name: Wadah (G)

Locality: East Garo Hills: Sasatgiri, Darbok, Nokreh and Simsang river banks, South Garo Hills: Rangmatgiri

Uses: For making mail and water container



Scientific Name: *Phyllostachys mannii* Gamble

Local Name: Siej Naga (K)

Locality: Commonly around Shillong and West Khasi Hills

Uses: Commonly used for fencing



Scientific Name: *Pseudostachyum polymorphum* Munro

Local Name: Tyra (K)(J), Wachal (G)

Locality: West Khasi Hills: Polra, around Risiang village

West Jaintia Hills: Lashka

East Garo Hills: Darugre and Siju

South Garo Hills: Balpakram National Park

Ri-Bhoi: Barapani Main Dam and Nongkhyllem Reserve

Uses: Considered best for making of baskets and mats, especially those used in tea factories. Also used for tying house walls.

The Pygmy Water Lily

Scientific Name: *Nymphaea teragona* Georgi

Local Name: Tiew Kynshew (Khasi)

Family: Nymphaceae

Distribution: China, Finland, Japan and India. In India, its distribution is restricted to one pond found at Nongkrem, East Khasi Hills, Meghalaya.

Threats Status: Rare and Endangered, especially in India

Threats: Siltation due to runoff from the surrounding agricultural fields, indiscriminate collection and cultivation at the vicinity of the pond.

Conservation Measure taken:

Efforts have been made by the Forest Department to conserve this rare and endangered plant. Since the area is under private ownership, a fifty year lease agreement has been made between the Forest Department and the landowner in 2010-2011, for the land measuring 10 Ha.

The Forest Department is actively working to conserve the habitat. Fencing was done and an additional pond has been dug Seedlings from the existing pond were transplanted to the new addition and the number of plants has increased. Protective drains have also been constructed to protect the pond from siltation caused by runoff from the surrounding agricultural fields.

Trees have also been planted in the surrounding areas to improve the micro-climatic conditions of the area.





Nymphaeateragona Georgi





Orchids
OF MEGHALAYA

Meghalaya is endowed with nearly 352 of species belonging to 98 genera. Orchids are prized for not only their attractive flowers but also their medicinal properties. Most orchids are epiphytes. However, lithophytes, terrestrials and saprophytes are also found to inhabit ranges from Sub-tropical evergreen to Moist mixed deciduous types of forests. *Aerides multiflorum, Coelogyne corymbosa, Cymbidium elegans, Dendrobium devonianum, Dendrobium longicornu, Paphiopedilum insigne, Rhynchostylis retusa, Phaius tankervilliae, Thunia marshalliana* and *Vanda coerulea* are few of the well known orchids of Meghalaya.

A good number of orchid species found in the region are vulnerable due to decline of their local habitats. The Forest Department has taken steps to standardize protocols for ex-situ conservation and large scale propagation of the following orchids.

1) *Dendrobium nobile*
2) *Dendrobium Chrysanthum*
3) *Vanda coerulea*
4) *Paphiopedillum insigne*
5) *Paphiopedillum villosum*
6) *Paphiopedillumpraecox*
7) *Cymbidium cochleare*
8) *Cymbidium elegans*
9) *Thunia marshalliana*





Family: Orchidaceae

Scientific Name: *Paphiopedilum insigne*

Local Name: Knup Mawiang (Khasi)

Location : Khasi and Jaintia Hills Districts

General description: A small to medium sized, humus epiphytic species with 5 to 6 strap-shaped, clear green leaves that are minutely bilobed, found in elevations ranging from 1000 to 2000 mts. It flowers in the late fall and winter.



Family: Orchidaceae

Scientific Name: *Vanda coerulea*

Local Name: Kjat Tyngab (Khasi)

Location: Khasi and Jaintia Hills Districts

General description: It is a striking beauty with large, vivid blue, long-lasting flowers. It is greatly prized by growers who used it extensively in breeding of deep blue and purple hybrids. The striking blue flowers of Vanda coerulea are its most recognisable characteristic. The flowers are around 13 cm across and notable for their small lip (labellum).



Family: Orchidaceae

Scientific Name: *Cymbidium aloifolium*

Local Name: Tyndah Mawsiang (Khasi)

Location: Khasi , Jaintia Hills and Ri-Bhoi District

General description: The plant blooms on a 75 cm pendant inflorescence with up to 75 flowers. Flowers are 4.25 cm wide with red stripes on petals and sepals. The plant produces four to five leaves per growth.



Family: Orchidaceae

Scientific Name: *Cymbidium elegans*

Local Name: Tdong Myrsiang(Khasi)

Location : Mawphlang, Smit, Shillong Peak

General description: Plants bloom from fall to winter. When blooming the plant forms a 60 cm pendent inflorescence with up to 35 flowers. Flowers are fragrant, whitish yellow and 3.75 cm wide.



Family: Orchidaceae

Scientific Name: *Arundina graminifolia*

Local Name: Tiew-pawanglum (Khasi)

Location: Cherrapunjee, Dawki, Jowai

General description: . It is a terrestrial orchid with reedy stems, forming large clumps growing to a height of 70 cm to 2 m. The plaited linear leaves are oblong lanceolate, with a length of 9-19 cm and a width of 0.8-1.5 cm. They bloom in succession on the terminal racemes, which are 7-16 cm long. These flowers, 5–8 cm in diameter, are a rosy lilac and white disk with a purple lip.



Family: Orchidaceae

Scientific Name: *Cymbidium eburneum*

Local Name: Tiew-lyngksiar lieh (Khasi)

Location: Markasa, Shillong, Mairang

General description: The flowers, are ivory-white with yellow- banded lips, are 8-12 cm across. Each pseudobulb usually carries two inflorescences (sometimes more) but there are only one or two flowers per inflorescence. The clustered pseudobulbs are enveloped at the base by several imbricating leaf bases carrying 9 to 15 linear-ligulate, thin textured, acute or acutely bifid leaves.



Family : Orchidaceae

Scientific Name : *Dendrobium chrysanthum*

Local Name: Tiew-lamat iong (Khasi)

Location : Cherrapunjee, Shillong, Pynursla

General description: The plant has pendulous, many noded, grooved stems upto 5 ft long. These stems carry ovate-lanceolate, acuminate, bright shiny green leaves. It blooms from April till November on an axillary, very short, opposite of leaves, few to several flowered, racemose inflorescence that arise on the nodes on the upper portion of an immature leafed psuedobulb. The inflorescence arises opposite of the leaves with 1 to 3 fragrant, fleshy flowers.



Family: Orchidaceae

Scientific Name: *Dendrobium fimbriatum*

Local name: Khmat Miaw (Khasi)

Location: Shillong, Upper Shillong, Nongstoin

General description: The plant is distinguishable by its maroon-blotched floral lip. This frost-tender perennial has leathery, lance-shaped leaves on long, erect to arching, spindle-shaped stems. Yellow to orange blooms with fringed, darker-hued lips appear in drooping, 6- to 15-flowered clusters from late winter to late spring. The lip has two maroon-brown blotches at its centre. The flowers are very fragrant.



Family: Orchidaceae

Scientific Name: *Pleione praecox*

Local Name: Soh Khasaw (Khasi)

Location: Upper Shillong, Cherrapunjee, Mawphlang, Siatbakon

General description: The plant blooms in the fall with a single 10 cm wide flower. Flowers are fragrant. The inflorescence appears after the leaves fall or withers. The plant usually bears one flower, sometimes two. The flower is large, pink to purplish red, sometimes white, with a yellow callus and sometimes with purple spots on the lip.

Family: Orchidaceae

Scientific Name: *Rhynchostylis retusa*

Local Name: Tdong Miaw/Bshad (Khasi)

Location: Dawki, Raliang, Rongrenggre

General description: The plant (also called Foxtail Orchid) is an exotic blooming orchid, with a bunch consisting of more than 100 pink-spotted white flowers.

These orchids have stout, short stems carrying up to 12, curved, fleshy, deeply channelled, retuse apical leaves. Densely flowered, cylindrical inflorescence blooms on an axillary pendent about 60 cms long , in the winter and early spring.



Medicinal PLANTS



Gloriosa superba

1. Glory lily

Scientific name: *Gloriosa superba*

Local Names: Malabar glory lily/Glory lily (English), Kalihari or Languli (Hindi), Tiewsharak (Khasi)

Family: Colchicaceae

This plant is found in India and Africa. It is the national flower of Zimbabwe and the state flower of Tamil Nadu. It has high medicinal value due to its antimicrobial properties; however, it is also sought after for its beautiful flame-like flowers. It is commonly found in the Garo Hills and Ri-Bhoi Districts in Meghalaya.

The Glory Lily is an herbaceous perennial climber growing between 3 to 5 metres long. It has a semi hard stem with tuberous roots. Flowers are at first green, later becoming yellow and finally, scarlet.

Uses:-

- Rhizomes are used as a tonic, anti-periodic, anti-helminthic and for treatment against snake bites and scorpion stings.
- The leaves are applied in the form of a paste to the forehead and neck to treat asthma for children. The leaf juice is used to treat infection of head lice.
- The sap extracted from the leaf tip is used to treat pimples and skin eruptions.
- The plant extracts are used to treat chronic ulcers, arthritis, cholera, colic, kidney problems and typhus.


Gloriosa superba flower


Gloriosa superba rhizome


Seeds of Gloriosa superba

2. Bael

Scientific name: *Aegle marmelosa*

Other Names: Bengal quince, Apple Wood, or Holy Fruit Tree in English, bael (Hindi), bilva (sanskrit), soh bel (khasi)

Family: Rutaceae

The tree is considered 'auspicious' by the Hindus and referred to as, 'Shivadruma', meaning-the tree of Shiva in ancient scriptures. It is indigenous to the Indian Sub-Continent and is commonly found in the Garo Hills, West Khasi Hills and Ri-Bhoi Districts of our State.

The tree can grow to a height of 7.5 meters. It has sharp spines on its branches, large leaves and greenish-white, sweet smelling flowers. The leaves are bitter in taste. Ripe fruits of this tree are green-white and sub-spherical having a woody and tough outer coat.

Uses:-

- The green fruits are effective as digestive astringents.
- The ripe fruits provide relief from chronic dysentery and diarrhoea and also act as a tonic for the brain and the heart. They are also used to treat bacillary dysentery and ulcers of the intestines.
- Root extracts are used to treat intermittent fever, melancholia and palpitation of the heart and in preparing an Ayurvedic medicine known as 'Dashmool'.
- Extract from leaves act as a febrifuge and relieves ophthalmic disorders and ulcers. Fresh leaves are used to treat conditions like weak heart, beri-beri and dropsy.


Aegle marmelos



Centella asiatica with flowers







3. Indian Pennywort

Scientific name: *Centella asiatica*

Other Names: Brahma-manduki (Hindi), Mandukaparni (Sanskrit), Khlieng syiar, Bat moina (Khasi)

Family: Apiaceae

This plant is native to Asia. It commonly occurs in the Khasi and Jaintia Hills Districts in Meghalaya.

The Pennywort is a slender, perennial, herbaceous creeper which flowers in August and September. It has a mild, bitter taste and its smell is similar to tobacco. The stems are reddish in colour and flowers are light violet. The fruits are enclosed in a hard pericarp.

Uses:-

- The plant has antibacterial, antiviral and anti-inflammatory properties and is used to heal leprosy, skin diseases, chronic inflammation of the skin, chronic rheumatism and piles.
- Extracts from leaves can also be mixed with coconut oil and applied on the head to strengthen the hair follicles and promote hair growth.
- The plant parts are also eaten raw to treat diseases like cholera, diarrhoea and dysentery.\

4. Long Pepper

Scientific name: *Piper longum*

Other Names: Long Pepper (English), Pippali (Hindi) & (Sanskrit), Sohmrit khlaw, Tipui (Khasi)

Family: Piperaceae

This plant is found in the Central Himalayas, the North Eastern Region of India, the lower Hills of West Bengal and Evergreen Forests of the Western Ghats. In Meghalaya, it is commonly found in the Southern slopes of the Khasi Hills and Jaintia Hills Districts.

This pepper plant is a slender aromatic perennial creeper with woody roots. The inflorescence is cylindrical with pedunculated spikes. The fruits are small and ovoid.

Uses:-

- The plant extract is commonly used in Ayurvedic preparation called 'Trikatu' which is prescribed for a variety of diseases.
- Traditional healers of Meghalaya mix the berries with honey to relieve the problems of asthma, cough and sore throat.
- The roots work as stimulants and are used to treat gout, lumbago as well as rheumatism.



Leaf and fruit of *Piper longum*



Dry fruit of *Piper longum*





Powerder form (*Piper longum*)


Rauvolfia serpentine


Rauvolfia serpentina flowers


Seeds of *Rauvolfia serpentina*


Rauvolfia serpentina roots

5. Sarpagandha

Scientific name: *Rauvolfia serpentina*

Other Names: Chandra (Bengali), Ahibuk (Sanskrit), Tdong pait puraw (Khasi)

Family: Apocynaceae

The plant is native to native to the Indian subcontinent and East Asia , though the name refers to a 16th century German botanist and physician, "Leonard Rauvolfia". In Meghalaya it is mainly found in Ri-Bhoi and the Garo Hills region.

Sarpagandha is an erect, evergreen sub-shrub. This plant is 0.2m to 0.6 m tall. The stem has no branch and has irregularly longitudinally fissured, pale brown and corky bark. The root is tuberous, soft, and bitter. The leaves are placed in whorls of 3 or 4.

Flowers are white or violet-tinged.

Uses:-

- In Meghalaya the plant extracts are used by traditional healers for treatment of malaria, chickenpox, tuberculosis and snake bites.
- In Ayurveda this herb is considered to be effective in lowering blood pressure and fever. It also helps in stimulating uterine contractions at the time of delivery and can relieve hysteria and itching in Urticaria.

5. Amla

Scientific name: *Emblica officinalis*

Other Names: Indian Gooseberry (English), Amlaki (Sanskrit), Sohmylleng (Khasi)

Family: Euphorbiaceae

Amla is native to South-East Asia. It is widely distributed throughout Meghalaya. It is a moderate size tree with grey bark. Dried and fresh fruits of Amla are used in Ayurveda. The preparations made from its fruits, leaves and bark have proven to be effective in relieving many diseases. It is very rich in Vitamin C and contains many minerals and vitamins.

Amla is a small to medium tree with a light brown to black bark. The fruit is a light green hued and is fleshy and globulose in shape. Fruits are generally around 2cms in diameter and may have a light pink shade too.

Uses:-

- Amla juice is used to treat diabetic patients. Studies have shown that Amla reduces the oxidative damage caused by blood sugar.
- In Meghalaya most of the traditional healers use the bark and fruits for treating skin diseases, menstrual disorders, stomach disorders, cough and cold.







Emblica officinalis fruits









Narpuh Wildlife Sanctuary

The Wildlife Wing looks after the conservation of wild flora and fauna which as per legal definition under the Wildlife (Protection) Act,1972 'includes any animal, aquatic or land vegetation which forms part of any habitat'. The role of this wing is to enforce this Act and rules made thereunder and to provide for long term ecological security of the State by identifying, protecting and conserving the basic nature of floral and faunal systems and restoration of degraded wildlife habitats.

The main objectives of the Wildlife Wing are:-

- To ensure ecological security of the State by identifying, protecting and conserving the basic nature of floral and faunal ecosystems and to restore degraded habitats.
- To manage the Government controlled Protected Area Network (PA), and other wildlife habitats outside the PA .
- To increase the Protected Areas Network through Community Reserves.
- To enhance socio- economic development in fringe villages and to reduce the dependency of local communities on forests.
- To sensitize local communities on conservation issues through awareness programmes and gainfully involve them in conservation efforts.
- To reduce man animal conflict
- To ensure effective control of poaching and illegal trade of wildlife products.

Management of Protected Areas

Shown below are details of Government owned and controlled PAs. Viz. National Parks and Wildlife Sanctuaries

SL. No	NATIONAL PARKS	Area(Kms)
1	Balpakram (Phase I)	220.00
2	Balpakram (Phase II)	132.00
3	Nokrek	47.48
	Total	399.48

SL. No	SANCTUARIES	Area(Kms)
4	Nongkhyllem	29.00
5	Nongkhyllem	6.64
6	Siju	5.18
7	Baghmara	0.02
8	Narpuh Wildlife Sanctuary	59.90
	Total	100.74

Nokrek Biosphere Reserve

National Parks and Wildlife Sanctuaries are areas that have been reserved and provided legal cover for their protection from undesirable human activities, being as they are the repositories of the immense biological diversity that the region in general and the state in particular is so well known for.

Certain other wildlife bearing areas, outside the national Parks and Wildlife Sanctuaries which are not under direct government control, have been identified for management as Biosphere Reserves and Elephant Reserves. In these areas public co-operation and participation in conservation programmes is imperative for achievement of management objectives. The areas so included in the protected area network are the Nokrek Biosphere Reserve and the Elephant Reserve both in the Garo Hills Region of the State.

The Nokrek Biosphere Reserve has recently been included in UNESCO's Biosphere Reserve Global Network. The designation has no force of law, but is aimed at minimizing biodiversity loss through the use of ecological and biodiversity sciences in policy and decision making, promoting environmental sustainability and enhancing the linkages between cultural and biological diversity.

The Nokrek Biosphere Reserve covers an area of 820 square kilometres and encompasses the Nokrek National Park, which is located on the Nokrek ridge in the core of the Reserve.

The National Park is home to a variety of animal species. Some of the animals include the Indian Elephant, Hoolock Gibbon, Stumped Tailed Macaque, Rhesus Macaque, Assamese Macaque, Slow Loris, Capped Langur, Leopard, Clouded Leopard, Leopard Cat, Golden Cat, Jungle Cat, Marbled Cat, Binturong, Civet, Mongoose, Himalayan Black Bear, Sloth Bear, Gaur, Sambar, Barking Deer, Wild Boar, Porcupine, Python, Pangolin amongst others.

The forest vegetation of Nokrek Biosphere Reserve consists of Evergreen, Semi Evergreen and Deciduous species, bamboo groves and grassland and also includes riverine forests. The forest is very dense along the ridges and in undisturbed patches whereas other areas are under various stages of degradation due to human activities. The flora includes trees, bamboos, grass species, medicinal plants, climbers, orchids including rare, endemic and threatened species. This area is well known for the indigenous Citrus species (Citrus indica locally known as Meimang narang) whose conservation and protection has drawn the attention of some eminent scientists.



Dense forest of Nokrek



Citrus indica in Nokrek Forest





Sunset in Balpakram National Park

Balpakram National Park

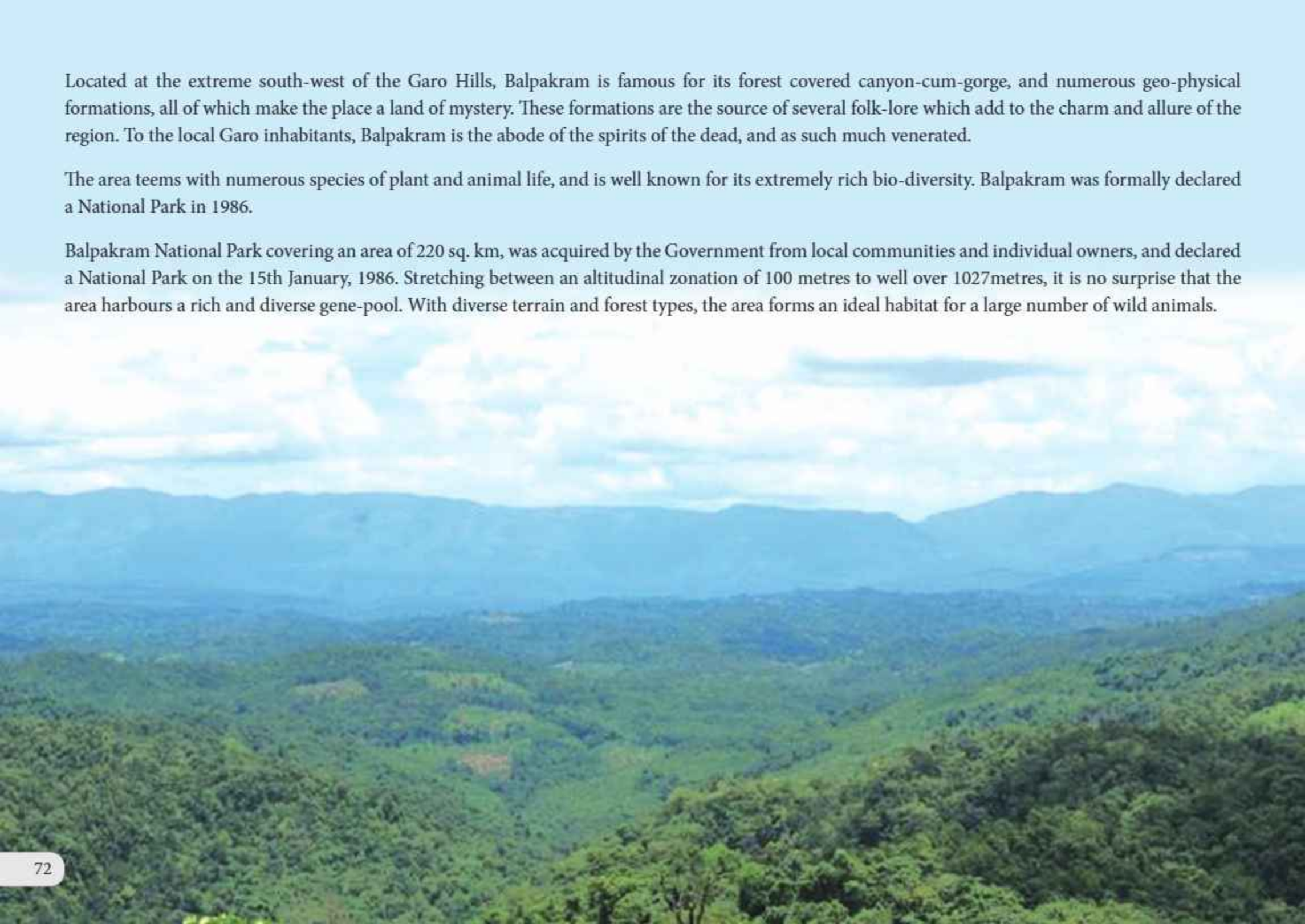


BALPAKRAM NATIONAL PARK – Resting Place of Spirits of the Dead

Located at the extreme south-west of the Garo Hills, Balpakram is famous for its forest covered canyon-cum-gorge, and numerous geo-physical formations, all of which make the place a land of mystery. These formations are the source of several folk-lore which add to the charm and allure of the region. To the local Garo inhabitants, Balpakram is the abode of the spirits of the dead, and as such much venerated.

The area teems with numerous species of plant and animal life, and is well known for its extremely rich bio-diversity. Balpakram was formally declared a National Park in 1986.

Balpakram National Park covering an area of 220 sq. km, was acquired by the Government from local communities and individual owners, and declared a National Park on the 15th January, 1986. Stretching between an altitudinal zonation of 100 metres to well over 1027metres, it is no surprise that the area harbours a rich and diverse gene-pool. With diverse terrain and forest types, the area forms an ideal habitat for a large number of wild animals.





Chitmang Peak



Sundew, (Drosera sp.)
an insectivorous plant

The area provides prime habitat for elephants, tigers, sambar, and barking deer. Rare animals like the gaur, wild buffalo, clouded leopard, Binturong, Black Himalayan Bear, and the like are found here.

The park consists of a succession of hills and valleys with a constant abrupt variation in altitude, aspect and gradient. It consists of a large plateau lying at an elevation of 797 metres with occasional high points reaching up to 860 metres, cut off by steep precipitous gorges. The deepest gorge is the Mahadeo gorge, locally known as Kundulop, with a drop of over 600 metres. The most prominent physical feature of the park is the bullock hump shaped Chitmang peak or Kailash, rising to a height of about 1023 metres.

Indian Elephant (*Elephas maximus*)
Pic: K.Kakati & S. Srikant





Chigisim Wari inside BNP



Hanging Rock (Rong Jalang)



Matcha Melaram inside BNP

Amur Falcon



AMUR FALCONS IN FLIGHT







Come November and the skies at Tyrso village in Ri-Bhoi District are filled with winged visitors that come all the way from Siberia - the Amur Falcon (Falco amurensis).

This raptor has of late made the small hamlet of Tyrso a roosting place during its long flight from Siberia to South Africa. Scores of falcons descend on the forests around the village and stay till about early December, when they resume their journey southwards.

PICTURES OF SOME ANIMALS CAUGHT ON TRAP CAMERAS



COMMON LEOPARD

The Common Leopard (Panthera pardus) is one of the five big cats in the genus Panthera. The leopard's success in the wild is due to its well camouflaged fur; its opportunistic hunting behaviour, broad based diet, and strength to lift heavy carcasses into trees.

This animal is listed as Near Threatened on the International Union for the Conservation of Naturel (IUCN) Red List because of it's declining population due to habitat loss and extensive usage of harmful chemicals for pest control.



CLOUDED LEOPARD

The Clouded Leopard (Neofelis nebulosa) which is the State Animal of Meghalaya has been classified as Vulnerable by the International Union for Conservation of Nature (IUCN).

Its total population in the country is estimated to be fewer than 10,000 and is showing a decreasing trend. The clouded leopard is considered to form an evolutionary link between the big cats and the small cats. It represents the smallest of the big cats, but is not closely related to the leopard. It is considered to be the closest living relative of the now extinct Sabre Toothed Tiger, with its large canine teeth.



MARBLED CAT

The Marbled cat (Pardofelis marmorata) is a small wild cat of South and Southeast Asia. It has been listed as Vulnerable by the IUCN, due to its low density population.

The marbled cat is similar in size to a domestic cat, with a more thickly furred tail (which may be longer than the body), showing adaptation to its arboreal lifestyle, where the tail is used as a counterbalance.



LEOPARD CAT

The Leopard Cat (Prionailurus bengalensis) is a small wild cat native to South and East Asia. It has been assessed as Least Concern on the IUCN Red List as it is widely distributed though it is threatened by habitat loss and hunting.

A leopard cat is about the size of a domestic cat, but is more slender, with longer legs and well-defined webs between its toes. Its small head is marked with two prominent dark stripes and a short and narrow white muzzle. There are two dark stripes running from the eyes to the ears, and smaller white streaks running from the eyes to the nose.



JUNGLE CAT

The Jungle Cat (Felis chaus), also called Reed Cat and Swamp Cat, is a medium-sized cat native of Asia from southern China in the east through Southeast and Central Asia.

The jungle cat is the largest of the extant Felis species. It has a small tuft on the ears, a comparatively short tail, and a distinct spinal crest. Because of its long legs, short tail and tuft on the ears, the jungle cat resembles a small lynx. The face is relatively slender. The fur colour varies with subspecies, ranging from yellowish-grey to reddish-brown or tawny-grey with black ticks.



LARGE INDIAN CIVET

The Large Indian Civet (Viverra zibetha) is native to South and Southeast Asia. It is listed as Near Threatened by IUCN, due to large scale hunting for its meat. Loss and fragmentation of its habitat is also a major threat.

Large Indian civets are generally grizzled greyish brown, with white and black bars along the neck. They have a white muzzle, and usually two white stripes and three black stripes on the tail. The hair on the back is longer than on the rest of the body.



SMALL INDIAN CIVET

The Small Indian Civet (Viverricula indica) is found in South and Southeast Asia. It is listed as Least Concern by IUCN because of its widespread geographical distribution, and healthy populations living in varied landscapes in many states.

The small Indian civet has a rather coarse fur that is brownish grey to pale yellowish brown, with usually several longitudinal black or brown bands on the back and longitudinal rows of spots on the sides. The neck markings are rather variable. Generally there are two dark stripes from behind the ear to the shoulders, and often a third in front, crossing the throat.



COMMON PALM CIVET

The Common Palm Civet (Paradoxurus hermaphroditus), is a cat-sized mammal found in the Southeast Asian Tropical rainforests. The habitat range is from the Himalayas and southern China, to the Philippines, the Malay peninsula and the Indonesian islands.

This animal is highly adaptive and can live in dense forests, agricultural areas and even alongside humans. Three rows of black spots run along each side of its body. The hair around its eyes, cheeks and muzzle is black, with spots of white under each eye and on each side of its nose. The ears, feet and last end of its tail are also black.



MASKED PALM CIVET

The Masked Palm Civet or gem-faced civet (Paguma larvata) is native to the Indian Subcontinent and Southeast Asia. It is classified by IUCN as Least Concern as it is widely found in many areas. Its population is unlikely to decline and it is tolerant to some degree of habitat modification.

Unlike most civets, its orange-brown to gray fur completely lacks spots, stripes, and other patterns except for a mask which consists of a prominent white stripe stretching from nose to forehead that bisects a black colouration on the face that extends to the edges of the cheeks and upto the forehead.



THREE STRIPED PALM CIVET

The Three-striped Palm Civet (Arctogalidia trivirgata) is also known as the small toothed Palm Civet. It is rarely seen, and is regarded as a critically endangered species.

This is the first published camera-trap record of the Small Toothed Palm Civet from India, and the first confirmed record of the species for the state of Meghalaya. (Kashmira Kakati* and Shikha Srikant, 2013)



ASIATIC BLACK BEAR

The Asian Black Bear (Ursus thibetanus) is also known as the Moon Bear and the White-Chested Bear. It is a medium-sized bear and has largely adapted to arboreal life.

The species is morphologically very similar to some species of prehistoric bears, and is thought by some scientists to be the ancestor of other extant bear species.

Though largely herbivorous, Asian Black Bears can be very aggressive toward humans, who frequently trap or kill them for traditional medicine.



YELLOW THROATED MARTEN

The Yellow-throated Marten (Martes flavigula) is an Asian species of the marten and is listed by the IUCN as Least Concern due to its wide distribution, evidently relatively stable population, and lack of major threats.

Its fur is brightly colored, consisting of a unique blend of black, white, golden-yellow and brown. It is an omnivore, with a wide food range from fruits and nectar to small animals. The yellow-throated marten is a fearless animal with no natural predators, because of its powerful build, its bright coloration and unpleasant odor. It shows little fear of humans or dogs, and can be easily tamed.



CRAB-EATING MONGOOSE

The Crab-Eating Mongoose (Herpestes urva) can be found over a wide area ranging from North-Eastern India to South-East Asia and Southern China and Taiwan.

It is generally grey in color, with a broad white stripe on its neck extending from its cheeks to its chest. It's throat is steel - grey with white tips on the hair, rendering a salt and pepper appearance. Its hind feet possess hairy soles. Its tail is short and homogeneously colored with a fairer tip.



HOG BADGER

The Hog Badger (Arctonyx collaris) is widespread in Central and Southeast Asia. It is listed as Near Threatened in the IUCN Red List of Threatened Species as its occurrence is patchy. The population is thought to be declining due to high levels of exploitation.

It has medium-length brown hair, stocky body, white throat, two black stripes on an elongated white face and a pink, pig-like snout. It generally resembles the European badger, though it is generally smaller, with larger claws on the front feet. Its tail has long white hairs, and its front feet have white claws.



ASIAN ELEPHANT

The Asian or Asiatic Elephant (Elephas maximus) is the only living species of the genus Elephas and is distributed in Southeast Asia from India in the west to Borneo in the East. Three subspecies are recognised—Elephas maximus maximus from Sri Lanka, the Indian elephant or E. m. indicus from mainland Asia, and E. m. sumatranus from the island of Sumatra.

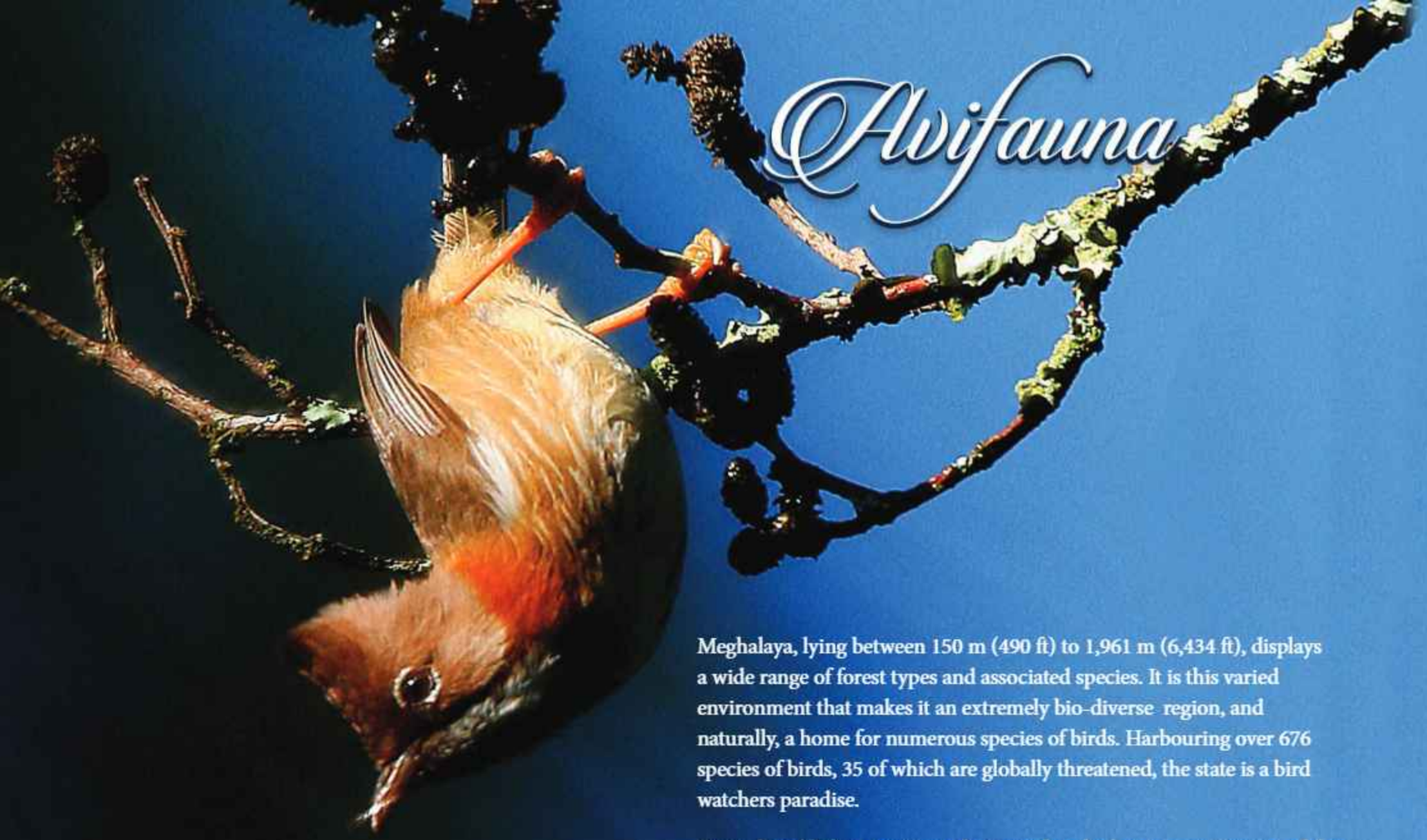
Asian elephants are the largest living land animals in Asia.



WILD BOAR

The Wild Boar (Sus scrofa), also known as the wild swine or Eurasian wild pig is native to much of Eurasia, North Africa, and the Greater Sunda Islands. Human intervention has spread its range further, making the species one of the widest-ranging mammals in the world, as well as the most widely spread suiform.

Avifauna



Meghalaya, lying between 150 m (490 ft) to 1,961 m (6,434 ft), displays a wide range of forest types and associated species. It is this varied environment that makes it an extremely bio-diverse region, and naturally, a home for numerous species of birds. Harbouring over 676 species of birds, 35 of which are globally threatened, the state is a bird watchers paradise.

Reproduced below are some photographs which are representative of the birds found in the region.

Whiskered Yuhina

Bird Photographs: Rajiv Mehta, IPS



Chrysococcyx maculatus also known as the Asian Emerald Cuckoo/ oriental cuckoo, prefers evergreen forests as its habitat and is identified by its emerald green upper plumage and barred belly. It forages mainly in tree canopies feeding on a variety of insects like ants, caterpillars and bugs.



Hemixos flavala commonly known as Ashy Bulbul /Brown-eared Bulbul/ Chestnut-backed Bulbul is a medium-large dark conspicuous bulbul, normally characterized by a tuft of grey crown feathers and olive yellow wing patch. The throat feathers are often puffed out. Its natural habitat includes broadleaved evergreen forests, pine forests and bamboo patches and its diet consists of small insects, fruits and a variety of other items.

Golden Fronted Leafbird (*Chloropsis aurifrons*)



Chloropsis aurifrons or Golden Fronted Leaf bird is identified by its green and yellow plumage. Adults have golden-orange forehead with a black mask extending from the eyes to lower throat. It feeds mostly on insects as well as taking fruits berries and nectar. It lives primarily in the canopy of deciduous forests but sometimes it may also occur in open semi-evergreen to evergreen habitats.



Hypsipetes leucocephalus popularly known as the Black Bulbul /Himalayan Black Bulbul can be easily identified by its slate grey to shimmering black body plumage. Its beak, legs and feet are all rich orange- red and it has a prominent black fluffy crown on its head. The bird is usually found in broadleaved forests and plantations. Seeds, insects and berries make up its primary source of food.



Anastomus oscitans commonly known as the Asian Open-Billed Stork is a large wading bird in the Stork family and is normally characterized by its dull yellow- grey bill whose upper and lower parts touch only at the base and tip. Adult plumage is white to off-white except for the black wing flight feathers. The bird breeds near inland wetlands and feeds on mollusks, frogs and large aquatic insects.



Pycnonotus melanicterus or the Black Crested Bulbul/Black-Capped Yellow Bulbul can be easily recognized from its black crest and yellow body plumage. It has a striking whitish eye. It prefers being in a dense forests and dense scrub lands and normally feeds on fruits, insects and coarse grains.



Psilopogon asiaticus also called the Blue Throated Barbet is a medium-sized short –tailed green barbet with throat and cheeks that are blue in colour. Both sexes having black-edge red cap and thick stout bills. They favour the canopy of fruiting trees where several species can often be seen feeding together. They feed primarily on fruits particularly figs, some flowers including insects





Oriolus chinensis is also referred to as the Black Naped Oriole due to the fact that it has a broad black eye stripe continuing to join on the nape i.e. back of the neck and has distinctly large stout orange-red bill. Its upper and underparts are entirely golden-yellow. Broadleaved forests and well wooded areas is preferred by this bird and it normally thrives on insects and fruits.

Centropus andamanensis commonly referred to as the Brown Coucal has a grey-buff head with rufous-purple back and wings. The tip of the wings is darker brown. It is usually found in forested areas, cultivations especially sugarcane and paddy fields, feeding on grasshoppers and other smaller insects.



Siva cyanouroptera is a pale brownish babbler with a bluish-black crown band and blue wing edges. It is also commonly known as the Blue winged Minia and can be sighted in relatively open evergreen forests and sometimes in forest edges. Its food includes insects, berries and seeds.



Lanius collurioides commonly called Burmese Shrike / Chestnut- rumped Shrike is characterized by its black forehead and slate-grey crown and nape. The beak, legs and feet are all black. It is found in edges of secondary broadleaved forests and in open bushy environments. Insects and other terrestrial vertebrates form its primary source of food.



Trochalopteron erythrocephalum also known as the Chestnut Crowned Laughing Thrush can be identified by dark scaling on the back of the neck and breast with olive-yellow wings and tail sides. It is normally seen in the undergrowth in forests and bushes in cultivation. It feeds on beetles, flies, ants and their larvae and pupae.



The common green magpie (*Cissa chinensis*) is a member of the crow family. It is bright green in colour (often fading to turquoise) and has a thick black stripe from the beak along the eyes and up to the neck. It sports red fleshy eye rims, bill and legs. The wings are reddish maroon. It is found from the lower Himalayas in north eastern India up to central Thailand, Malaysia, Sumatra, in clearings/scrub. This bird seeks food both on the ground and in trees, and takes a very high percentage of animal prey from countless invertebrates, small reptiles, mammals and young birds and eggs.



Spilornis cheela is a medium - sized raptor and is commonly known as the Crested Serpent Eagle. It is recognized by the presence of white mottling in the underparts with the skin around the eyes and yellow and bare beak. They prefer the edges of forests where they can soar and effectively hunt. Their diet consists of snakes and lizards and numerous other reptiles.



Phaenicophaeus tristis or the Green-billed Malkoha is a species of non-parasitic cuckoo found throughout South and Southeast Asia. The bird has a waxy bluish black with a long graduated tail and white tips to the tail feathers. The bill is prominent and curved. These birds are found in dry scrubs and thin forests. Feeds on Insects, large caterpillars, and lizards.



Heterophasia gracilis also known as the Grey Sibia is characterized by a black cap, grey mantle, white underparts and grey patches on wings and tail. Its natural habitat is subtropical or tropical moist montane forests. Insects, including bees, berries and small fruits are its food.



Oriolus larvatus or the Black-Headed Oriole is a bird of open woodlands and cultivation. Its food includes insects and fruit, especially figs, found in the tree canopies where they spend much of their time. The males are striking with the typical oriole black and yellow colouration. The plumage is predominantly yellow, with a solid black hood, and black also in the wings and tail centre.



Lanius tephronotus also called the Grey-backed Shrike has dark grey upper parts and is found commonly in bushes, scrub and secondary growth. Among the shrikes, they breed at the highest altitude. Feeds on mostly insects, such as crickets and grasshoppers, beetles and caterpillars; small vertebrates, such as lizards



Hierococcyx sparverioides or the large Indian Hawk-Cuckoo can be distinguished from common hawk cuckoo by its browner upper body plumage prominently barred underparts and broader tail banding. Its natural habitats are temperate forests and subtropical or tropical mangrove forests. A large variety of insects such as, caterpillars, crickets, grasshoppers, beetles, bugs, roaches, ants and spiders constitute its diet.



Sturnia malabarica commonly known as the Chestnut-tailed Starling or Grey-headed Myna is a member of the starling family of perching birds. It is a resident or partially migratory species found in wooded habitats in India and Southeast Asia. Like most starlings, the chestnut-tailed starling is fairly omnivorous, eating fruit, nectar and insects.



Psarisomus dalhousiae or the Long-tailed Broadbill is a forest bird that lives on insects. It is very sociable and normally travels in large, noisy parties except during the mating season. It is normally characterized by its yellow 'ear' spot and throat with a bluish-black long tail. It prefers broadleaved semi-evergreen forests as its habitat.



Niltava grandis also referred to as the Large Niltava has a dark blue body plumage with brilliant blue crown, neck path and shoulder patch. Its natural habitat is subtropical or tropical montane forests. Food items include small to medium-sized invertebrates and berries; large crickets including small snakes.



Nisaetus nipalensis commonly called the Mountain Hawk-eagle or Hodgson's Hawk-eagle is a bird of prey. The typical adult has brown upperparts and pale underparts, with barring on the undersides of the flight feathers and tail. The breast belly and underwing coverts are heavily streaked. It is a bird of mountain woodland, which builds a stick nest in a tree and lays usually a single egg. Mountain hawk-eagles eat small mammals, birds and reptiles.



Lonchura punctulata or the Scaly-breasted Munia or spotted munia is a sparrow-sized finch native to tropical Asia. Its name is based on the distinct scale-like feather markings on the breast and belly. munia eats mainly grass seeds apart from berries and small insects. They forage in flocks and communicate with soft calls and whistles. The species is highly social and may sometimes roost with other species of munias. This species is found in tropical plains and grasslands.



Zoothera dauma also known as the Scaly Thrush due to the fact that it has boldly scaled upperparts and underparts on a paler white or yellowish background. The most striking identification feature in flight is the black band on the white underwings. The scaly thrush is very secretive, preferring dense cover. It is omnivorous, eating a wide range of insects, earthworms and berries.



Common Rosefinch
(*Erythrina erythrina*)



Cuculus optatus commonly called as the Oriental Cuckoo is identified by its dark ashy-grey upperparts. The belly is creamy-white with dark bars. The legs and feet are orange-yellow and there is a bare yellow ring around the eye. It mainly inhabits forests, occurring in coniferous, deciduous and mixed forest. It feeds mainly on insects and their larvae, foraging for them in trees and bushes as well as on the ground.



Geokichla citrina. It is popularly known as the Orange-headed Thrush and is common in well-wooded areas. The species shows a preference for shady damp areas, and like many Zoothera thrushes, can be quite secretive. The orange-headed thrush is omnivorous, eating a wide range of insects, earthworms and fruit. The male of this small thrush has uniform grey upperparts, and an orange head and underparts.



Parus monticolus or the Green-backed Tit is commonly seen in temperate forests, and subtropical or tropical moist lowland forests. It has broad black ventral line, greenish upperparts and double wingbar. Feed includes small invertebrates and larvae, flower buds, some fruit, including berries, and seeds.



The Common Hill Myna (*Gracula religiosa*) is a member of the starling family (Sturnidae), commonly called the "mynah" or the "myna". It is a black plumaged bird, with a yellow beak and legs and characteristic yellow flaps of skin over the side of its head and nape.

The hill mynah is distinguished by its loud shrill whistle and other gurgling sounds it normally makes in the wild, but in captivity this bird has the ability to mimic the human voice and tongue, and have been known to reproduce tunes and songs with amazing clarity.

It is this ability that has made the bird a very sought after pet, and made the species threatened in the wild.

The Hill Mynah is the State bird of Meghalaya.



Psittacula alexandri also known as the Red-breasted Parakeet is easily identified by the large reddish patch on its breast . The head is pale blue-grey with thin black line from base of the beak to its eyes, and a distinctive black chin. It favours moist deciduous forests, secondary growth, mangroves, teak and coconut plantations and woodlands. It feeds on nectar and flowers.



Treron curvirostra generally called as the Thick-billed Green Pigeon is rather a small-sized pigeon as compared to other green pigeons. It is usually characterixed by a thick pale greenish bill with red base, bluish-Green eye ring, grey crown and maroon mantle, underside green in both sexes. It occurs in a very variety of forest types including evergreen, mixed deciduous. It is primarily a Frugivorous, reported to be expecially attracted to figs.



Copsychus malabaricus commonly known as the White-rumped Shama is one among the popularly known song birds. Males are more striking with a glossy blue-black head, breast and upperparts while females are duller with a more greyish brown colouration. Both sexes have pink legs and feet. A wide variety of arthropods, including ants, caterpillars, moths, beetles, flies, grasshoppers, centipedes, spiders, also worms and berries make up their food source. It is found in forested areas, in secondary jungle or where there is dense underbrush or thick wood cover.



Yuhina flavicollis or the Whiskered Yuhina is usually characterized by its grey head and crest, golden-yellow hindcollar, black moustache and yellowish-white underside .Its natural habitat is subtropical or tropical moist montane forests. Its diet comprises of Insects and their larvae (including aquatic insects), small snails (including pond snails); also flower nectar and berries.

Pericrocotus ethologus also called as the Long-tailed Minivet occurs in a wide range of open forest types including broadleaved and pine forests. Females have an indistinct yellow forehead with a pale yellow throat while males have a black or glossed blue head and upper back with a scarlet lower back. Eats chiefly insects, including beetles, flies and insect larvae, also spiders.



Female Long-tailed Minivet



Male Long Tailed Minivet (*Pericrocotus ethologus*)



The long-tailed Shrike or Rufous-backed Shrike *(Lanius schach)* is a member of the bird family Lannidae, the shrikes. They have a long and narrow black tail, have a black mask and forehead, rufous rump and flanks and a small white patch on the shoulder. They are found mainly in scrub and open habitats. Feeding on lizards, large insects, small birds and rodents, they maintain feeding territories and are usually found single or in pairs that are well spaced out.

Zosterops palpebrosus commonly referred to as the Oriental White-Eye is a small passerine bird in the white-eye family. They forage in small groups, feeding on nectar and small insects. They are easily identified by the distinctive white eye-ring and overall yellowish upperparts. The species is found in a wide range of habitats from scrub to moist forest. It is Omnivorous. Vegetable matter includes small buds, seeds, fruits and nectar; animal food mostly insects.







Copsychus saularis or the Oriental Magpie-Robin is a small passerine bird. They are distinctive black and white birds with a long tail that is held upright as they forage on the ground or perch conspicuously. The male has black upperparts, head and throat apart from a white shoulder patch. The underparts and the sides of the long tail are white. Females are greyish black above and greyish white. Oriental magpie-robin is found in open woodland and cultivated areas often close to human habitations. The diet of magpie robins includes mainly insects and other invertebrates. Although mainly insectivorous, they are known to occasionally take flower nectar, geckos, leeches, centipedes and even fish.



Pycnonotus jocosus or the Red-whiskered Bulbul is very common in hill forests and urban gardens within its range. It has brown upper-parts and whitish underparts with buff flanks and a dark spur running onto the breast at shoulder level. It has a tall pointed black crest, red face patch and thin black moustachial line. It feeds on fruits, nectar and insects.



Columba livia commonly known as the Rock Dove or Rock Pigeon has a dark bluish grey head neck and chest with glossy yellowish green and reddish-purple iridescence along its neck and wing feathers. Two dark bands across the wings are seen in most pigeons and one bluish-grey band across the tail. Feeds on Seeds, fruits, rarely invertebrates.



Passer rutilans generally known as the Russet Sparrow or cinnamon tree sparrow is a passerine bird of the sparrow family. Its plumage is mainly warm reddish-brown above and grey below. It is found commonly in light woodlands, in edges of villages and in cultivation. This sparrow feeds mainly on the seeds of herbs and grains, but it also eats berries and insects.



Orthotomus sutorius or the Common Tailorbird is a songbird and is distinctive in having a long upright tail, greenish upper body plumage and rust coloured forehead and crown. This passerine bird is typically found in open farmland, scrub, forest edges and gardens. Tailorbirds get their name from the way their nest is constructed. The edges of a large leaf are pierced and sewn together with plant fibre or spider silk to make a cradle in which the actual nest is built. Like most warblers, the common tailorbird is insectivorous. They forage for insects and have been known to feed on a range of beetles and bugs.



Eumyias thalassinus or the Verditer Flycatcher is named after its distinctive greenish-blue or turquoise blue plumage. The adult males are intense blue on all areas of the body, except for the black eye-patch and grey vent. Adult females and sub-adults are lighter blue. They forage above the canopy level and perch on electric wires or exposed tree top branches. Their diet includes small invertebrates and berries.

Wildlife Protection

In spite of our best efforts to protect wildlife, there are times when some misguided souls transgress the bounds of humanity and indulge in wanton killing of animals either in the guise of "sport" or in keeping with the "hunter-gatherer" tradition.

To keep such activities to a minimum, regular patrolling is carried out in vulnerable areas. The vigilant staff of the Wildlife Wing have succeeded in thwarting many an attempt to poach wildlife and several offenders have been caught.



Seized wildlife articles and weapons



Wildlife Staff on patrol duty

Rescue and Rehabilitation OF WILDLIFE





Apprehended smugglers



Birds seized from local village markets

A pangolin being released into the wild



Butterflies



Butterflies are a diverse group of insects belonging to the order 'Lepidoptera'. The lepidopterans are usually 'scaly winged insects' which are short-lived. They are found in almost all types of habitats.

Systematic Classification -

Kingdom : Animalia
Phylum : Arthropoda
Class : Insecta
Order : Lepidoptera
Family : Papilionidae
Pieridae
Nymphalidae
Lycaenidae
Hesperiidae

Basic Idenfication Keys -

- **Papilionidae (Swallowtails and Apollos):** The individuals are usually large and have a predominance of black or brownish-black colour.
- **Pieridae (White and Yellows) :** Usually small to medium sized and predominantly white or yellow colour.
- **Nymphalidae (Brush-footed butterflies):** The size varies from large to minute; they display bright colours with mostly tawny background and black markings.
- **Lycaenidae (Blues) :** Usually small to medium - sized with predominance of blue to violet colour.
- **Hesperiidae (Skippers) :** Usually swift. They tend to fly in a skipping pattern. Mostly small in size with predominantly dark brown to black colour.

Butterfly Behavior -

- **Basking :** Since butterflies are exothermic in nature they tend to habitually rely on an external source like the sun for energy, they perch with their wings open and exposed towards the sun to warm their flight muscles.
- **Flight :** The contraction and relaxation of the muscles found in the thorax region are responsible in controlling the wing-flapping movement which in turn helps in creating the lift required for flight. Butterflies are usually diurnal, preferring bright sunshine to fly around. This behaviour allows them to escape predators, to locate food, mates and host plants.
- **Roosting :** This behaviour is usually exhibited at night and overcast days; when they hang upside down with wings closed, underneath the foliage of plants.
- **Mimicry :** Most species of butterflies are usually brightly coloured on the upperside of their wings, while carrying a dull pattern and colour on the underside for camouflage.
- **Feeding :** Most butterflies depend on plant nectar for their nutritional needs but some depend on manure, tree-sap and over-ripe fruits.
- **Puddling :** Puddling behaviour is usually seen in male individuals on the blues, yellows and swallowtails. They often congregate on damp soils to collect salts and minerals concentrated there to incorporate into their sperm pockets for copulation.
- **Gully-bottoming :** Butterflies of several species congregate in large numbers in shady nullahs and riverbeds during the hotter part of the day to cool themselves and avoid desiccation, and also to locate mates.

Importance -

Butterflies are considered to be an important component of the forest ecosystem due to the various ecological roles they play :

- in the food chain.
- as agents of pollination of flowering plants.
- as biological indicators of environmental variation because some species have a very narrow range of environmental requirement.
- they are also undoubtably objects of beauty.



Club Silverline (*Spindasis syama*) - Moore
Distribution in Meghalaya: Ri-bhoi
Status: Uncommon
Wingspan: 26-40 mm
Habit & Habitat: Rapid flight;
flies among grassy undergrowth,
found among brightly sunlit
gaps or along wide trails.



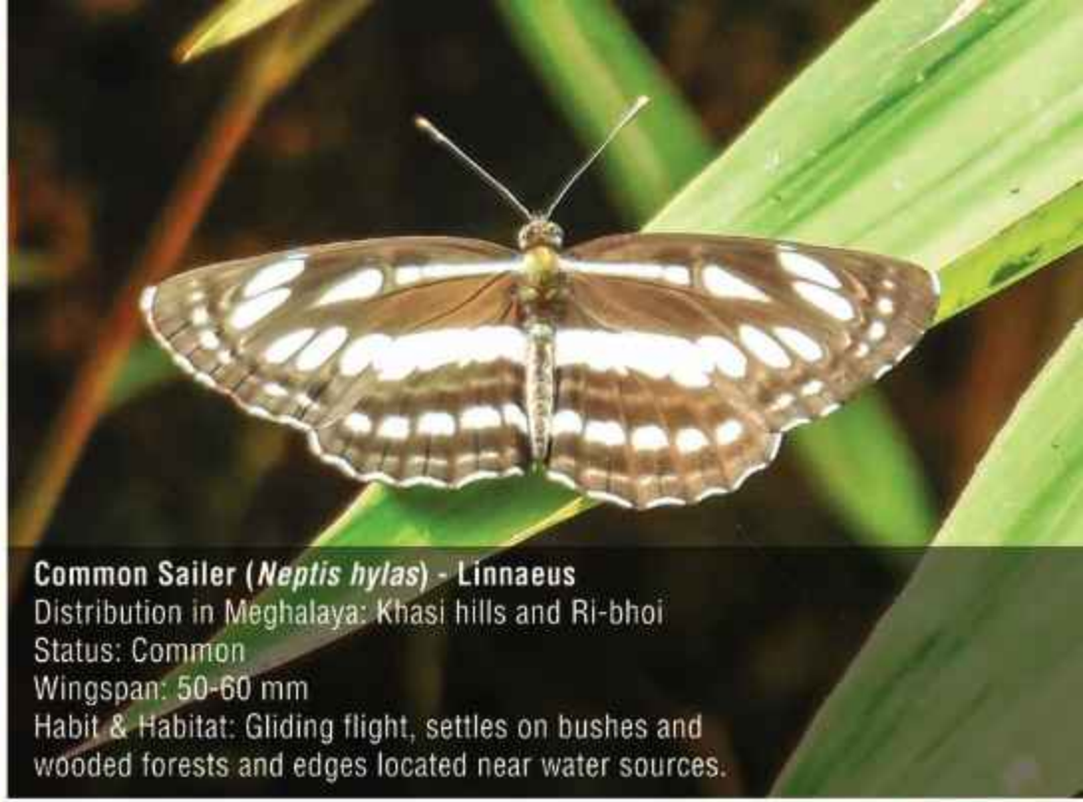
Common Bluebottle (*Graphium sarpedon*) - Linnaeus
Distribution in Meghalaya: Khasi and Jaintia hills
Status: Common
Wingspan: 80-90 mm
Habit & Habitat: Swift-flight, occurs in almost
all forest habits and at medium to lower altitudes.



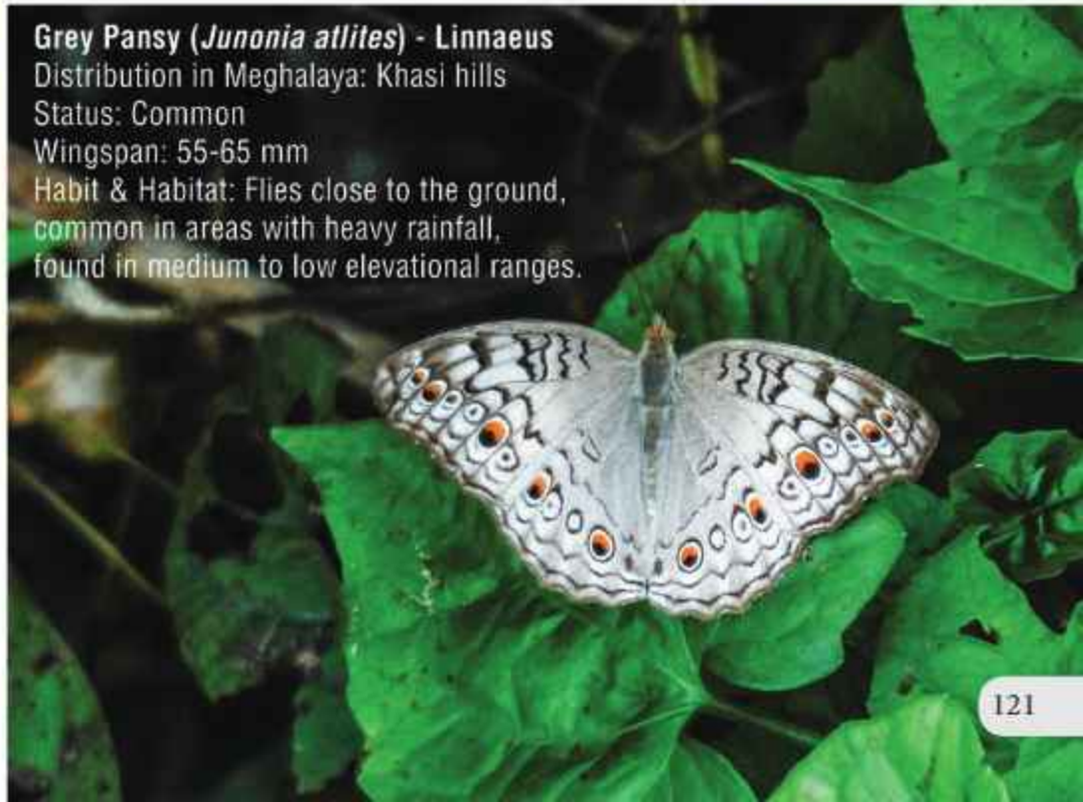
Common Grass Yellow (*Eurema hecabe*) – Linnaeus
Distribution in Meghalaya: Khasi hills and Ri-bhoi
Status: Common
Wingspan: 35-50 mm
Habit & Habitat: Weak fluttering flight,
found in open areas and forest edges.



Tailed Cupid (*Everes argiades*) - Pallas
Distribution in Meghalaya: Jaintia hills and Khasi hills
Status: Uncommon
Wingspan: 22-28 mm
Habit & Habitat: Fast flier, usually found on forest edges and vegetation close to the ground.



Common Sailer (*Neptis hylas*) - Linnaeus
Distribution in Meghalaya: Khasi hills and Ri-bhoi
Status: Common
Wingspan: 50-60 mm
Habit & Habitat: Gliding flight, settles on bushes and wooded forests and edges located near water sources.



Grey Pansy (*Junonia atlites*) - Linnaeus
Distribution in Meghalaya: Khasi hills
Status: Common
Wingspan: 55-65 mm
Habit & Habitat: Flies close to the ground, common in areas with heavy rainfall, found in medium to low elevational ranges.



Purple Sapphire (*Heliophorus epicles*) - Godart
Distribution in Meghalaya: Khasi hills
Status: Common
Wingspan: 28-34 mm
Habit & Habitat: Fast flight, found along both forested areas and open fields, flies close to the ground vegetation.



Tailed Judy (*Abisara neophron*) - Hewitson
Distribution in Meghalaya: Khasi Hills
Status: Uncommon
Wingspan: 50 – 55 mm.
Habit & Habitat: Usually found in shaded forest patches.



White Dragontail (*Lamproptera curius*) - Fabricius
Distribution in Meghalaya: Khasi hills
Status: Common
Wingspan: 40 – 50 mm.
Habit & Habitat: Quick flier, usually seen near stream and forest edges, fond of damp patches.



Common Tit (*Hypolycaena erylus*) - Godart
Distribution in Meghalaya: Ri-bhoi
Status: Common
Wingspan: 32-36 mm
Habit & Habitat: Fast flier, found in damp areas and stream edges.



Green Commodore (*Sumalia daraxa*) - Doubleday
Distribution in Meghalaya: Khasi Hills
Status: Uncommon
Wingspan: 60-70 mm
Habit and Habitat: Quick flier, prefer damp soil patches, streams and forest edges; found in moderate to lower elevations.



Dark Judy (*Abisara fylla*) - Westwood
Distribution in Meghalaya: Khasi hills
Status: Common
Wingspan: 50-60 mm
Habit & Habitat: Fast flier; found in bushes, forest edges and damp areas of regions with moderate elevations.



Common Palmfly (Elymnias hypermnestra) - Linnaeus
Distribution in Meghalaya: Khasi hills and Ri-bhoi
Status: Common
Wingspan: 60-80 mm
Habit & Habitat: Weak fluttering flight, found in forest openings and stream edges of areas with medium elevation.



Yellow Gorgon (*Meandrusa payeni*) - Boisduval
Distribution in Meghalaya: Khasi hills
Status: Rare
Wingspan: 110-130 mm.
Habit & Habitat: Powerful flight, found in moist soil, stream edges with dense forest of areas with medium elevations.



Spotless Grass Yellow (*Eurema laeta*) - Boisduval
Distribution in Meghalaya: Ri-bhoi
Status: Uncommon
Wingspan: 35-45 mm
Habit & Habitat: Flies close to the ground, found in forest and stream edges of relatively drier areas.

Community Reserves

The Wildlife Protection Act, after the amendment in the year 2000, has become more community centric, and in seizing the opportunity which thus presented itself, the Wildlife Wing of the Forest Department took upon itself the task of bringing the benefits that would naturally devolve out of conservation of our forest wealth to the people. It therefore became the endeavour of the Forest Department to strive to strike a balance between development and conservation. Feelers were sent out to the various communities and villages in the state to voluntarily participate in this project.

With these two basic objectives in mind, and in an attempt to conserve our natural wealth, while at the same time ensuring that the villagers are benefited, several meetings were arranged with the villagers, these issues were discussed and their views on the matter were solicited. The initial reaction was not very favourable, with most of the villagers bearing apprehensions that their land once taken up by the Forest Department for any activity sponsored by the Government would eventually be taken over by the Government and that they would lose their land. These fears were put to rest and eventually several villages agreed to involve themselves in the project on a trial basis which has since taken off successfully, and seeing the difference the project has made to the lifestyles of the involved villagers, several more villages have voluntarily come forward to join in the project.

In all, 41 community reserves have been notified, bringing an area of about 39.6 Sq km under the protected area network, the newly added areas now coming under the protection of the Wildlife Protection Act, 1972. What is now needed to be done is to project these villages/forest areas as shining examples so that other villages come forward and volunteer their lands for the purpose of declaring them as community reserves, thus bringing more and more area under protection, while at the same time ensuring a better life for the communities involved. The benefits which have accrued to the villagers are tangible, as will be demonstrated later in this write-up.

Areas selected: Typically, the areas selected for the project are villages which have a high dependency on forests, like hunter gatherers, Shifting cultivators, and the like. In some cases, sacred groves, especially those in imminent threat of encroachments and degradation have also been chosen. In all these areas it was noticed that the water regime was dismal, to say the least, and the villagers had to walk fairly large distances to collect water for their daily needs.

Some of the initial activities undertaken in these areas were those that centered around the improvement of water retention, creation of water harvesting structures and check dams so that water would be retained in and around the areas and be easily accessible to the villagers. The areas so treated have shown a marked improvement in the water quantity available.

Eco - Development Works

People living around forests depend heavily on these natural resources for their livelihood thus depleting them. It is important to reduce such dependency by providing appropriate, eco friendly alternative livelihood options to these communities. The department initiates activities related to eco-tourism, animal husbandry, fish rearing, beekeeping and horticulture, to name a few, keeping in view the need for economic upliftment of the people and also to make the people participatory stakeholders in wildlife conservation efforts.

Assistance is provided in the establishment of crucial village infrastructure such as footpaths, drinking water supply, schools and community halls. Eco Friendly income generating activities related to Agriculture , Horticulture., Animal Husbandry and Pisiculture , to name a few are also supported by the Department.

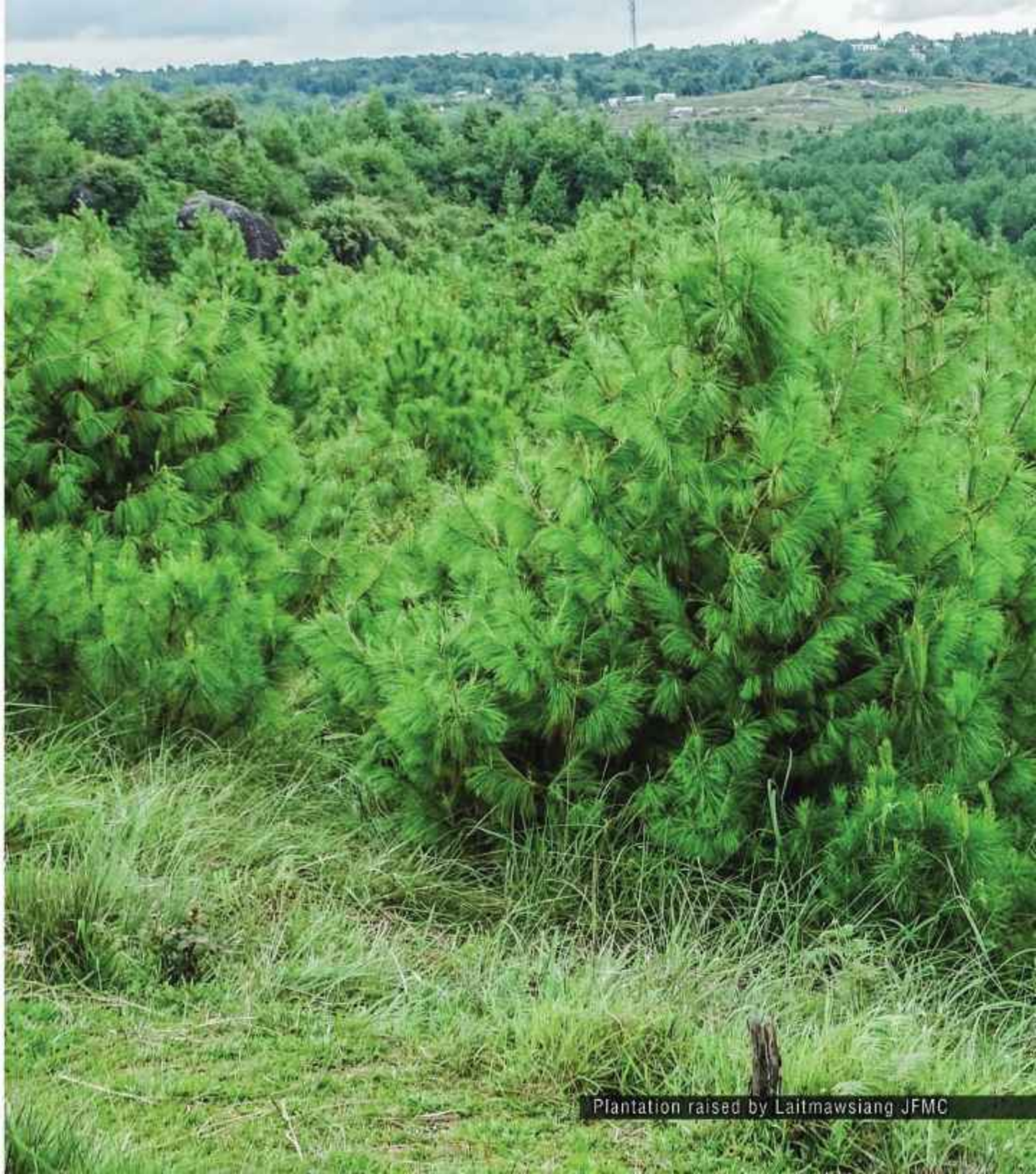


Social Forestry

The Social Forestry & Environment Wing is tasked with the afforestation and ecological restoration of degraded forests belonging to various clans, communities and private individuals which are not directly owned by the Government.

Land is selected for such restoration with the consent of the owners and an agreement is made to allow the Forest Department to temporarily take over the land for a 10 (ten) year period during which time plantations are created and tended. The planted land is then handed over to the owners and is thereafter managed under the provisions of the Meghalaya Tree Felling (Non forest Areas) Rules 2006 which regulate tree fellings and replanting in the land.

Afforestation schemes are also under taken under the National Afforestation Programme (NAP) through the mechanism of Joint Forest Management Committees (JFMCs) comprising of representatives of the Forest Department, District Council and locals.



Plantation raised by Laitmawsiang JFMC



The National Mission for Green India or Green India Mission (GIM)

The Social Forestry wing is also implementing the schemes under Green India Mission (GIM). The Green India Mission in Meghalaya was constituted vide Govt. Notification No. Env.1/2012/155 dated 19/03/2012 with the Principal Chief Conservator of Forests & HoFF as the Chairman, Chief Conservator of forests, Social Forestry & Environment as Member Secretary and the others include the Director of Soil & Water Conservation, Director of Horticulture & the Director of Water Resources as members.

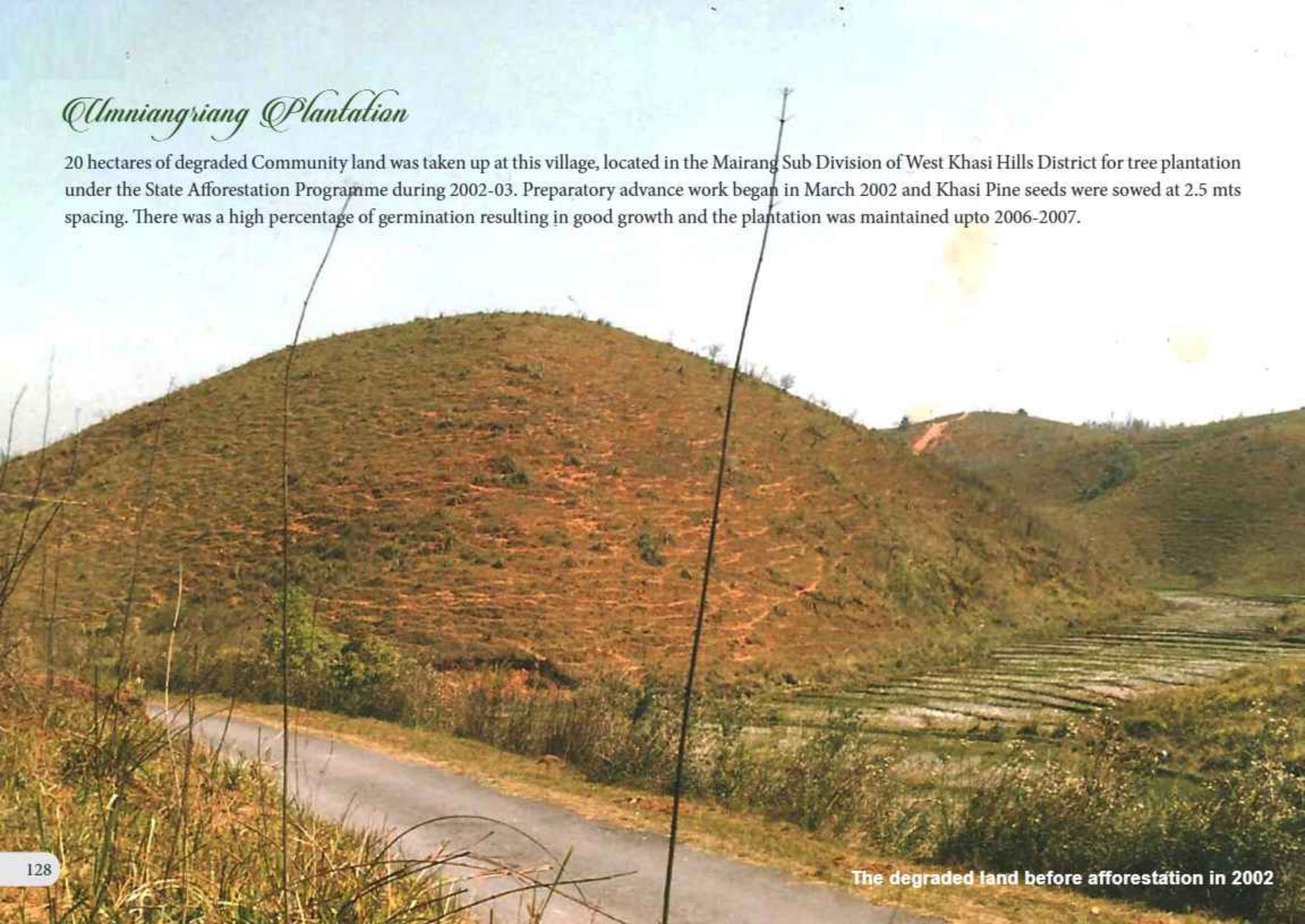
Green India Mission is another flagship scheme of the Social forestry Wing. The Government of Meghalaya , Forest and Environment Department created a GIM cell in the office of the PCCF & HoFF Meghalaya, chaired by the PCCF & HoFF and supported by the State FDA functioning in the Social Forestry and Environment Wing. The GIM Cell and the SFDA have completed identification of L1, L2 and L3 level landscapes for treatment under the mission based on parameters like the projected vulnerability of forests to climate change, status of forest cover, significant biodiversity/ ecosystem value, etc.

The whole State has been identified as the Broad Landscape of Importance (L1 landscape) while ***3 (three) Blocks (Betasing, Mawshynrut and Khliehriat)*** have been identified as the Operational Units (L2 landscapes). A first phase perspective plan was prepared which included sub-mission on quality enhancement, ecosystem restoration and increase in forest cover, urban and peri-urban tree cover, agro forestry, wetland restoration, and alternative to fuelwood. ***Five (5) Joint Forest Management Committees (JFMC) under Betasing Block, Seven(7) JFMCs under Mawshynrut Block and Six (6) JFMCs*** under Khliehriat Block are implementing the GIM activities at present. The MoEF & CC sanctioned and released an amount of Rs 89.70 lakhs as a bridge plan or for preparatory works during the year 2013-14. All ***the 18 JFMCs*** mentioned above have prepared Micro Plans at the L3 level.

The afforestation initiatives carried out under the NAP has played a role in increasing the forest cover of the State. The launch of GIM is expected to augment the positive outcomes towards greening the state.

Umniangriang Plantation

20 hectares of degraded Community land was taken up at this village, located in the Mairang Sub Division of West Khasi Hills District for tree plantation under the State Afforestation Programme during 2002-03. Preparatory advance work began in March 2002 and Khasi Pine seeds were sowed at 2.5 mts spacing. There was a high percentage of germination resulting in good growth and the plantation was maintained upto 2006-2007.



The degraded land before afforestation in 2002

The active involvement of the local people and the dorbar itself has helped to ensure success of the project. With regulations imposed against grazing, appropriate fire protection measures and social fencing enforced by the people, the barren land has now turned into a lush green forest.



The degraded land after afforestation in 2005



The degraded land after afforestation in 2007

Photjaud - Rangthong Plantation

Before implementation of the NAP scheme, the people of this village under Maharam Syiemship in the South West Khasi Hills District did not give much importance to nature conservation. The forest areas were subjected to destructive activities like tree felling and forest fires. Community hunting was also a regular ritual. Sustainable traditional fishing practices gave way to destructive methods like netting and use of poisons which decimated the fish population and polluted the water bodies.

The Forest Department took it as a challenge to restore this degraded forest. The villagers were initially reluctant to hand over the land to the Department for afforestation, fearing loss of ownership. However, after being made aware of the good intentions of the Department, they shed their unfounded fears and on being reassured agreed to the formation of a JFMC for this village in 2004-2005.

After 8 years of implementation the positive changes in the planted areas became evident.The people could see the recreated lush green forests which began to attract variety of small animals and birds and improve the water regime of the area.

In February 2014, a fire broke out in the beautifully created plantation. The villagers promptly contained the fire and voluntarily resowed the damaged plantation with pine seeds given by the Forest Department. Now they are in the process of regaining the lost greenery that they so lovingly created and nurtured.

The optimistic villagers are now looking to reap the rewards of their perseverance and have welcomed the benefits which have accrued from implementing of the scheme through entry Point activities and Soil & moisture conservation works.


GOVERNMENT OF MEGHALAYA
JFMC
PHOTJAUD RANGTHONG
YEAR OF CREATION 2004-05
UP TO 2010-11
AREA IN HECTRE.235 HA.

Entry Point Activities (EPA)

These activities are an integral part of afforestation projects. They play a crucial motivational role, in breaking the ice and winning the confidence of the people. EPAs also compensate the community for the 'closure' of areas taken for forestry activities. These activities eventually give way to formation of the Village Development Funds which provides a formal, larger and more endurable financial basis for initiating developmental activities in the area.

The community collectively identifies entry point activities which are generally in the nature of durable community assets and implements them on a priority basis. A few examples of EPA are: Water harvesting structures like check dams for irrigation, drinking water facilities, roads and culverts, school and community use assets, energy saving and non conventional energy devices such as solar power etc.



EPA at Umtasor



EPA at Mawphlang



EPA at Nonglanglieh

Soil & Moisture Conservation (SMC)

JFMCs are encouraged to undertake activities under NAP schemes to prevent and control erosion and conserve soil and water by obstructing flow of run off through engineering interventions to retain soil moisture and recharge ground water which can be put to domestic and agricultural uses.



Check Dam constructed under NAP(SMC)



Photjaud-Rangthong received the "Clean and Green Award 2014" from the Deputy Commissioner, South West Khasi Hills District on 26th January 2014





Construction of eco-Friendly Crematoria:

Another success story of the Department is the financing and promotion of Eco-friendly Crematoria designed by the enterprising, (Late) Ma Kambel Shullai. The traditional methods of cremation require lot of firewood, thereby putting pressure on forests. The newly designed Eco-Friendly Crematorium however, consumes less wood and takes less time to burn. Consequently, fuel costs are reduced and there is less pressure on forests. People have also appreciated the new technology. The Forest Department is continuing its efforts to construct such crematoria throughout the State.



Eco-friendly crematorium at Laskein Village in West Jaintia Hills

Roadside Plantations

One of the major activities of the Forest Department is creation of tree plantations along the roadsides with the objectives of controlling erosion and preventing landslides along the roads, shading the road from excessive heat and rain, increasing the forest tree cover and maintaining the ecology and natural beauty of the landscape.

Trees selected are of ornamental, fast growing, soil binding and fruit bearing species depending on the site requirements.







Hon'ble Chief Minister of Meghalaya
Dr. Mukul M. Sangma planting a sapling at Pynursla
as part of World Environment Day celebrations

Seedling distribution to public and observation of important days : -

Important days such as World Environment Day, Vanmahotsava, World Biodiversity Day, to name a few, are a time where awareness programmes are regularly carried out with the objective of creating mass awareness on the need to conserve nature and also to sustain the momentum of ongoing movements.

On such days, there is mass distribution of seedlings to enable people to take up tree plantations in sites of their choice. School children who are our future hope are involved in a large scale. Such plantations are usually maintained by the respective participants. The Department provides all possible assistance whenever required.

Voluntary plantations are a welcome addition to increase tree cover and should be taken up whenever and wherever possible.





Students participating in tree planting as part of World Environment Day celebrations at Pynursla

Forest Nurseries : - There is plenty of scope for enhancement of the forest cover and improvement of the quality and density of forests under moderately dense and open forest categories. The State also needs to address the depletion of important critical catchment areas in order to sustain the benefits that we derive from such areas. We need to arrest on further deterioration of the environment in and around the coal and limestone mining areas in the state in the interest of general health and welfare of the people living in those areas. An important supporting activity to address the requirements mentioned above is by raising nurseries to supply good quality planting stocks in sufficient quantity.

To meet the demand of seedlings for afforestation and reclamation of mines, etc., the Department has established Hi-Tech Nurseries/ Permanent Nurseries in all the Districts. These nurseries play an important role in ensuring the success of the greening drives throughout the State.





Planting Stock Production Centre, Samgong, East Garo Hills



Nursery at Sohra Mawmluh



Nursery at Lumbaniang, Shella

Parks and Gardens

Many Parks and Gardens have been created both in rural and urban areas of the State which serve as places of recreation for the general public and also act as the 'green lungs' especially in urban areas. Efforts are on to create more Parks and Gardens in those areas where there are no such recreational centres.

a) **Ialong Park** : - Ialong Park ; located near Jowai is part of the Sacred Grove of Seinraij Ialong. It was opened to the general public on the 5th October, 2013 when it was officially inaugurated by the former His Excellency Governor of Meghalaya Shri K. K. Paul. Since then, the Park has successfully established its identity on the tourist map of the State due to its unique location, landscape and floral composition of the area and scenic view of the Myntdu river. It attracts a wide range of visitors mostly during the months of September to May.





(b) **Thang kharang Park** : - Thangkharang Park - *Thang (smoked or burnt) kharang which literally means smoked fish.* The park has an area of 5.5 hectares and is located about 66 Km away from Shillong in the Mawsmai Elaka. It was first opened to the public on 29th June 1996. Thangkharang Park was declared as a Revenue Park with effect from the 15th May 1997 and the revenue collected is in the form of entry fees. The flow of tourist and visitors to Thankharang Park is increasing year to year and the peak season is from the month of October to February. Many villagers earn their livelihood from the park by establishing tea and fast food stalls. The local village dorbar also collects parking fees and the villagers are also engaged by the Department for various construction and maintenance works in the Park.









A view of Kynrem falls
from Thangkharang Park

(c) **Ward's Lake** : - Ward's Lake, is "A sylvan site of breath taking beauty" covering an area of 6.28 hectares, in the heart of Shillong. William Erskine Ward, Commissioner of the then Assam Province developed the park during the British rule in 1892-93 and thus the name Ward's Lake. Out of 6.28 hectare, about 2.20 hectare is an artificially created lake built by constructing a dyke on the northern side. The Park generates revenue for the State by way of entry fees. The serene beauty and idyllic atmosphere of the park attracts tourists/visitors amidst the humdrum of surrounding city life. The Peak tourist season is during October to April.



Ward's Lake









Thadlaskien Lake

Thadlaskien Lake, located at Mukhla village, is a man-made lake in the West Jaintia Hills District of the State . Legend has it that it was dug using just the tips of bows by soldiers of Sajar Nangli, the Lyngskor (Chief Minister) of the king of the Jaintias, Markuhain, whose capital was in Jaintiapur, (now in Bangladesh).

Sajar Nangli was very popular amonst the people and his soldiers, and this troubled the king who feared that Sajar Nangli would overthrow him and seize power.

The fearful king now plotted to kill Sajar Nangli, and with the help of the Dalloi of Nartiang, hatched a plot to poison him in a feast to be held in his honour. However, an old lady, loyal to Sajar Nangli overheard them and quickly informed him of the plot.

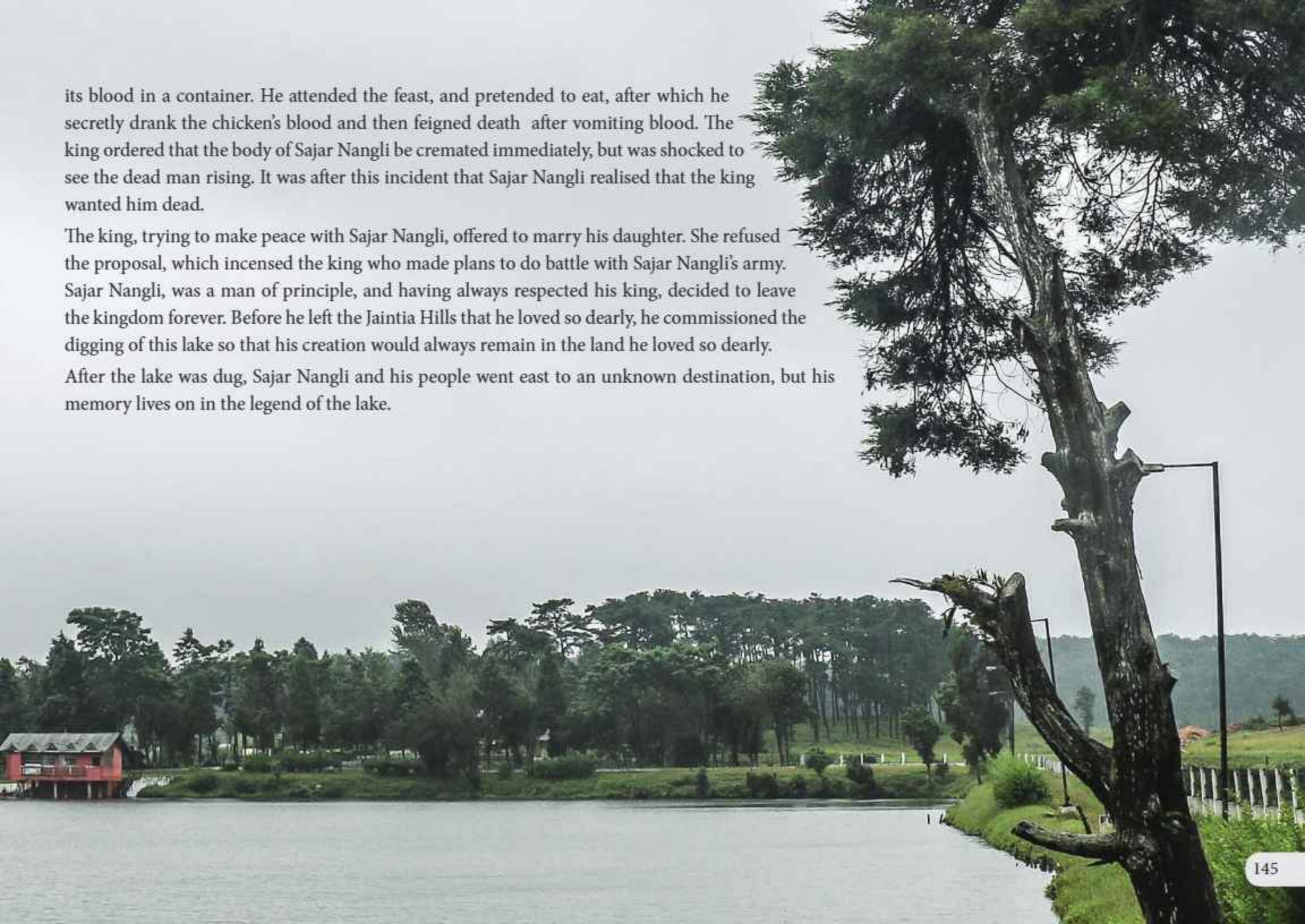
On the night of the feast, Sajar Nangli slaughtered a chicken and stored



its blood in a container. He attended the feast, and pretended to eat, after which he secretly drank the chicken's blood and then feigned death after vomiting blood. The king ordered that the body of Sajar Nangli be cremated immediately, but was shocked to see the dead man rising. It was after this incident that Sajar Nangli realised that the king wanted him dead.

The king, trying to make peace with Sajar Nangli, offered to marry his daughter. She refused the proposal, which incensed the king who made plans to do battle with Sajar Nangli's army. Sajar Nangli, was a man of principle, and having always respected his king, decided to leave the kingdom forever. Before he left the Jaintia Hills that he loved so dearly, he commissioned the digging of this lake so that his creation would always remain in the land he loved so dearly.

After the lake was dug, Sajar Nangli and his people went east to an unknown destination, but his memory lives on in the legend of the lake.



Eco Tourism

In Meghalaya, tourism is essentially nature based Eco-tourism.

Ecotourism is being actively encouraged in the wilderness and community forests, where nature and its natural scenic beauty are at their best. such areas are being promoted as tourist destinations.

The Forest Department creates the necessary eco-compatible tourist infrastructure and entrusts the local communities to manage the facilities and to generate income from such activities.





TOURIST ACCOMODATION - NOKREK

India's 1st Cherry Blossom Festival 2016

Meghalaya enjoys a unique distinction of having cherry trees that bloom in the month of November. Cherry trees found in other countries usually bloom during March-April. *The India's 1st Cherry Blossom Festival held from 14th to 17th November, 2016 at Shillong had made a mark as the* ***First International Cherry Blossom Festival celebrated during Autumn*** and has placed Meghalaya on the global tourist map.

About the Plant:- Botanical name:- *Prunus cerasoides*; Common Name:- Wild Himalayan Cherry; Local Name:- Dieng Sohiongkrem (Khasi)

Cherry is a handsome middle sized (of about 15 mts high) deciduous tree. It is distributed in Khasi Hills (up to an altitude of 6000 ft.) of Meghalaya and its range extends in the Himalayas from Himachal Pradesh to South West China, Myanmar and Thailand. The tree sheds its leaves towards the end of rainy season. Flowers are usually pink in colour, fading into white, appearing without or with leaves. There are two types of cherries - one edible (fruits) and the other, ornamental (flowers). The probable origin of the Cherry is the Himalayas. The wood is hard, strong, durable and the branches make excellent walking sticks. The fruits give a dark green dye and the seeds are used for manufacturing necklaces. The Cherry Blossom, when in full bloom, is a majestic sight to behold.

India's 1st Cherry Blossom Festival:-

The Cherry Blossom Festival is celebrated in a few countries every year. This Festival has established inter-continental friendship across the world. Now there are cherry blossom festivals in the USA, Japan, New Zealand and parts of Korea, attracting millions of tourists. **Meghalaya State became the first in the World to have an *Autumn Cherry Blossom Festival*** based on the local cherry plants which bloom uniquely during **November.**

The Cherry Blossom Festival Initiative of the Government of Meghalaya (Forest & Environment Department) *in collaboration with* **the Institute of Bio-resources for Sustainable & Development (IBSD), Government of India**

The Cherry Blossom Festival in the State was launched on the 14th of May 2015 at Shillong by planting the saplings of the cherry blossom. During the launch it was felt that *the Festival is well suited to Meghalaya's salubrious climate and the rich culture of food, music and cultural festivals at selected sites that already exist in the State. The plantation will also be extended to areas in and around Shillong and also to New Shillong Township.* During the month of July - August 2015, approximately 2000 cherry saplings were planted by the Social Forestry & Environment Wing of the Forest & Environment Department, Government of Meghalaya at Mawphlang and on the roadside along Mawiong - Umiam (Barapani) National Highway No. 40, with tree guards being provided after planting. More number of cherry saplings were planted during 2016 in different parts of Shillong city and its adjacent places.

India's first Cherry Blossom Festival 2016 was in sync with the Government of Meghalaya's push for "*Destination Meghalaya*".

Late Shri F. Suchiang IFS, Chief Conservator of Forests (CCF), Meghalaya took the initiative for avenue plantation of cherry saplings in and around Shillong during the1980s and 1990s. The mature cherry trees which are now luxuriantly thriving and blooming during November every year in and around Shillong are the legacy recieved through a vision of Late Shri F. Suchiang IFS, CCF Meghalya whose mission paved the way to celebrate a memorable and historical event of Cherry Blossom Festival in Shillong from this year onwards.

The following events were organized in the Cherry Blossom Festival 2016:-

DAY-1 (14-11-2016)

Sl. No.	Programme	Venue
1.	Opening Ceremony	At 2nd Ground, Polo
2.	Ceremonial Planting of Cherry Saplings	-do-
3.	Visit to Exhibition and Food Stalls	-do-
4.	Cycling by the Shillong Cycling and Bike Riders by RERAM	-do-
5.	Cultural Programme	-do-
6.	Drawing and Painting Competition	At 1st Museum, Soso Tham Auditorium
7.	Multi Cuisine Food Fest etc. with live Music Band	At State Guest House (Tara Ghar) Opp Ward's Lake
8.	Story Telling Sessions	At Ward's Lake
9.	Fashion Show	-do-

DAY-2 (15-11-2016)

Sl. No.	Programme	Venue
1.	Cherry Blossom Run	Fire Brigade Ground to Polo 2nd Ground
2.	Exhibition Cum Sale & Food Fest	At 2nd Ground, Polo
3.	Archery	-do-
4.	Stunt Bikers Display by Freaky Bykerz	Parking Lot, Polo
5.	Multi Cuisine Food Fest etc. with live Music Band	State Guest House (Tara Ghar) Opp Ward's Lake
6.	Unplugged Western Music	At Ward's Lake
7.	Renditions of Traditional Songs of Meghalaya	-do-

DAY-3 (16-11-2016)

Sl. No.	Programme	Venue
1.	Exhibition Cum Sale & Food Fest	At 2nd Ground, Polo
2.	Miss Cherry Blossom 2016 Beauty Pageant and Rock Concert	-do-

DAY-4 (17-11-2016)

Sl. No.	Programme	Venue
1.	Cherry Blossom Golf Tournament	At Shillong Golf Course
2.	Exhibition Cum Sale & Food Fest	At 2nd Ground, Polo
3.	Closing Ceremony	-do-

The active participation of various departments viz., Department of Information and Public Relations (DIPR), Public Works Department (PWD), Tourism, Election, Arts & Culture, Sports & Youth Affairs, Horticulture, Agriculture, Sericulture, Handloom & Handicraft, Soil & Water Conservation, Industries, Veterinary & Animal Husbandry, Fisheries, Meghalaya Biodiversity Board, State Medicinal Plants Board, District Administration, Police Department, Home Guards, MBDA, Shillong Municipal Board, Shillong Recreational Ground Trust, the Shillong Golf Club, performing Artistes, numerous Sport Associations, Entrepreneurs, Stakeholders and the overwhelm response of people from different walks of life to witness such programmes (traditional songs and dances, food fest, wine festival and exhibition cum sale, a magic show etc) organised during the Festival was remarkable. The festival also witnessed the visit of a large number of tourists coming from outside the state and abroad. Such an important festivals would definitely boost up the tourism industry in the State. In times to come, more items to involve the younger generation and the students would be planned and organized to showcase, preserve and promote the rich arts, culture, environment and biodiversity of the state.

GLIMPSES OF THE 1st CHERRY BLOSSOM FESTIVAL 14th - 17th NOVEMBER, 2016 AT SHILLONG, MEGHALAYA



























Research & Training Activities

Tissue Culture

Micro propagation techniques provide a means to produce high quality planting material in large quantities from the elite vegetative parent source. Clonal multiplication is an effective strategy for raising plantations of high productivity. Tissue culture also helps in multiplying planting material of rare and endangered species and thus it is a very useful method for ex-situ conservation of such species.

A state of the art tissue culture lab has been established under the Silviculture Division at Upper Shillong.


Orchid planted at Tissue Culture






In vitro propagation of plant

Hi-tech Nursery cum Training Centre

The High Technology Nurseries have been established with twin objectives; to meet the requirement of quality planting material for the Silviculture Division and to use this facility for imparting training to the frontline staff in improved nursery practices.

A hi-tech nursery cum training centre has been established at Umkhuti near Barapani. The hi-tech nursery has a mist chamber, mother bed chamber and a net shade house where improved nursery techniques can be practiced for raising quality planting stock by vegetative propagation techniques.







Inauguration of Hi-Tech Nursery at Umkhuti, Ri-Bhoi District

Myths & Folklore

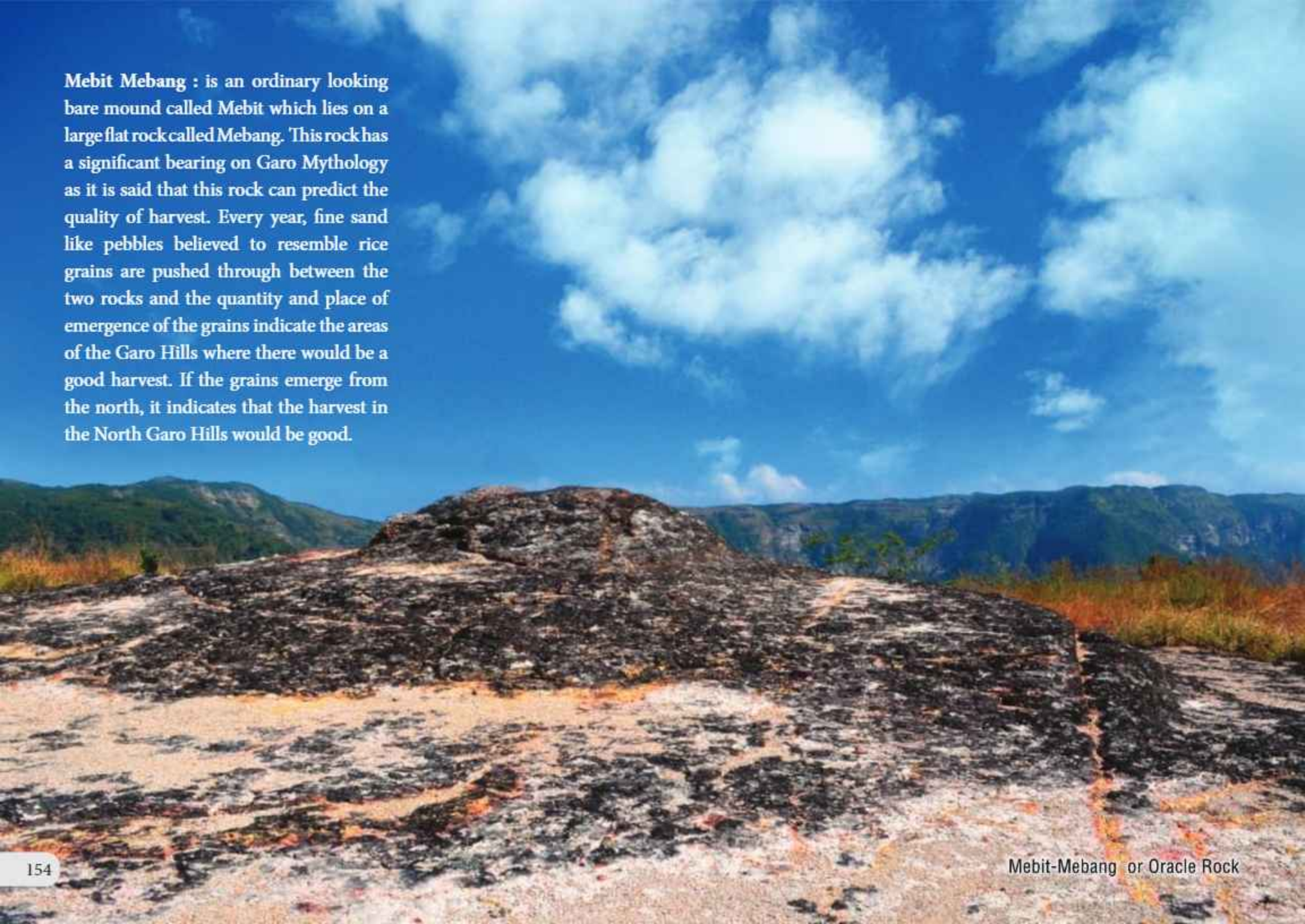
Garo mythology revolves around a few central characters, the most prominent being *"Dikki"*. Gods, warriors, demons and spirits are interwoven in the legends surrounding Balpakram. *Dikki's* mother, *Menu Rani*, wife of *Racha ante* was the owner of all the lands of the Achik country. *Bandi* is *Dikki's* brother, fabled to be the strongest and most athletic of the family, and son of *Menu Rani's* younger sister. Another of *Menu Rani's* sisters is said to be the mother of Balwa, also referred to as Balwa Enok, the Wind God. In fact Balpakram is said to be derived from his name, "Balwa", and "Pakram", meaning "land of perpetual wind". Dikki, Balwa and Bandi are very faithful to Goera, the Thunder God, and are, as a reward, made the supreme trio ruling over Balpakram. Dikki's wife, Gitting and So're, wife of Bandi along with Matchru, Dikki's and Gitting's maternal uncle manage the spirit world, Memang-Asong.

Most of the landmarks and natural formations in Balpakram bear some reference to these mythical beings. With this background, the folk lore and mythology of the Garos is reproduced to a small extent in this chapter. The material has been collected from several sources, and only those which were repeated with the least deviations have been highlighted here.

The Garos believe in an endless cycle of birth, life and death. They believe that when a person dies, his spirit goes to Balpakram resides and labours there until it is time either to be permitted entry into Memang-Asong, or to be reincarnated. There are in Balpakram, many natural formations/structures which add credence to this belief, and the tales woven around these structures more or less bear out the folk-lore. A few such formations and the tales relating to them are reproduced below :



Mebit Mebang : is an ordinary looking bare mound called Mebit which lies on a large flat rock called Mebang. This rock has a significant bearing on Garo Mythology as it is said that this rock can predict the quality of harvest. Every year, fine sand like pebbles believed to resemble rice grains are pushed through between the two rocks and the quantity and place of emergence of the grains indicate the areas of the Garo Hills where there would be a good harvest. If the grains emerge from the north, it indicates that the harvest in the North Garo Hills would be good.



Mebit-Mebang or Oracle Rock

On the Balpakram plateau is a huge rock formation which looks like an upturned boat. This is called Dikkini Ring, or Dikki's boat. Legend has it that Dikki was carving a dugout out of a log, but before he could finish it, the new day dawned. As spirits only worked at night, and had to complete what they started the same night, he abandoned the task and the unfinished boat turned to stone.



Dikkini Ring or Dikki's boat

The market of the spirits also known as Me.mang anti char.ram is a big flat rocky outcrop on the plateau that has several indentations on it which an imaginative mind would relate to hoof-prints or animal pug marks. Legend has it that at the beginning of time, man and animals lived together in harmony and even did business with each other. This was a regular market place and man and animal bought and sold wares from each other.



Me.mang anti cha.ram or Spirit Market.

This pool is called the black pool because the water in this pool is always black in spite of the fact that the stream feeding this pool contains crystal clear water. Garo folk lore has it that the pool is used by the spirits of the departed to wash away all earthly impurities as well as soot caused by cremation before they enter the spirit world, Memang-Asong, causing the water to turn black.



Chi dimak — Chi anggal or the black pool

Several such tales woven around the Balpakram landscape have been told and retold, and perhaps the best tellers of these stories are the locals of the area who have been known to enthral many adventure seekers who have, in turn, shared these stories over the years.



So'reni Suunti



Memang Gate

Whatever be the reason for the emergence of such stories and legends, the wisdom of the ancients who lived in these hills long before commercial exploitation of forests became commonplace must be commended, for their insight and wisdom in associating the landscape and the flora and fauna with gods and spirits has ensured that the Balpakram landscape is preserved till today.



Pinda Cave

Gitting Napram Cave

From our Archives

Colonialism in India brought about fundamental changes in patterns of resources use of forests and is considered as a watershed era in the history of the sub-continent. Prior to arrival of the British, forest land was a common property resource of the community. Far from being open in access, the use of forests was regulated by institutional structures such as caste and cultural barriers.

In Eastern India, the area under forests began to shrink as part of the process of colonialism. During the 19th century, the British empowered local Zamindars to levy taxes and control activities of indigenous communities who were encouraged to clear forests for cultivation.

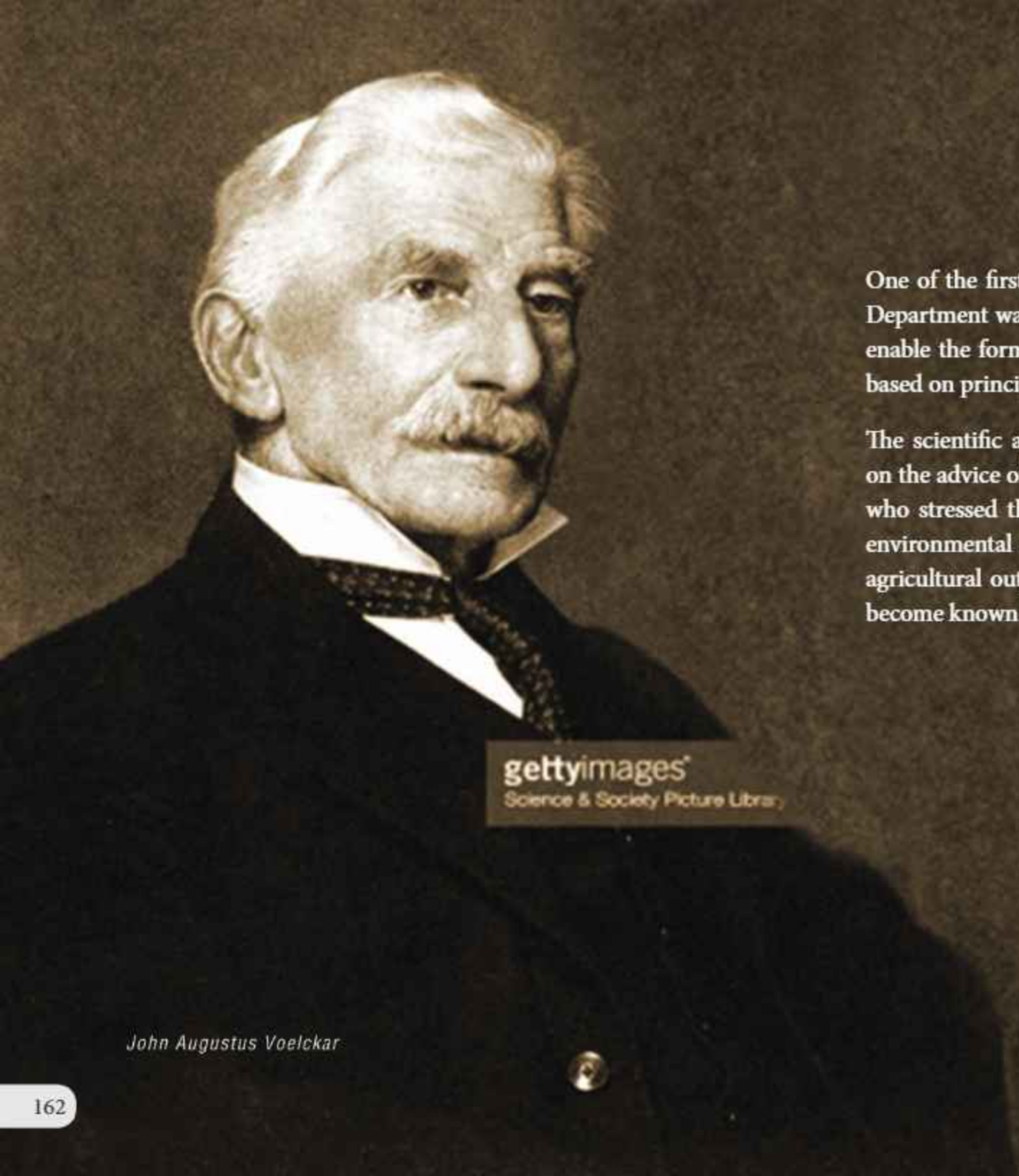
As the process of colonialism advanced, natural resources came to be increasingly commodified, and in serving the needs of the British Empire began to flow out of the sub-continent. Tree species such as the Indian Teak were highly priced for their qualities and were widely used to facilitate maritime expansion especially during time of conflict such as the Napoleonic wars and World War efforts. The most notable resource intensive undertaking by the British Raj was the large scale use of timber in construction of the Indian Railway System.

The prospect of a diminishing resource base and a need for abundant raw materials for the sprawling British Empire was the reason behind the colonial drive to manage and control forest resources more effectively. To achieve this aim would necessitate the creation of a suitable organization and thus in 1864, the Forest Department was formed.

In order to function effectively, the Forest Department required legislation that would curtail the hitherto unrestricted access of rural communities to forest. Ten years after the British had first issued a memorandum that regulated the movement of forest dwellers within the forests of India, the Forest Act of 1865 was introduced. This Act empowered the government to appropriate any land covered with trees. This initial law was later superseded by a more inclusive piece of legislation in the form of the Indian Forest Act of 1878, which was particularly concerned with removing the ambiguity about the 'absolute proprietary right of the state'. The subsequent large-scale annexation of Indian forests by the colonial state, corresponded to a critical turning point in curtailment of local communities' rights.



Large group of young planted oak. Sir Dietrich Brandis and the English forest students of 1890

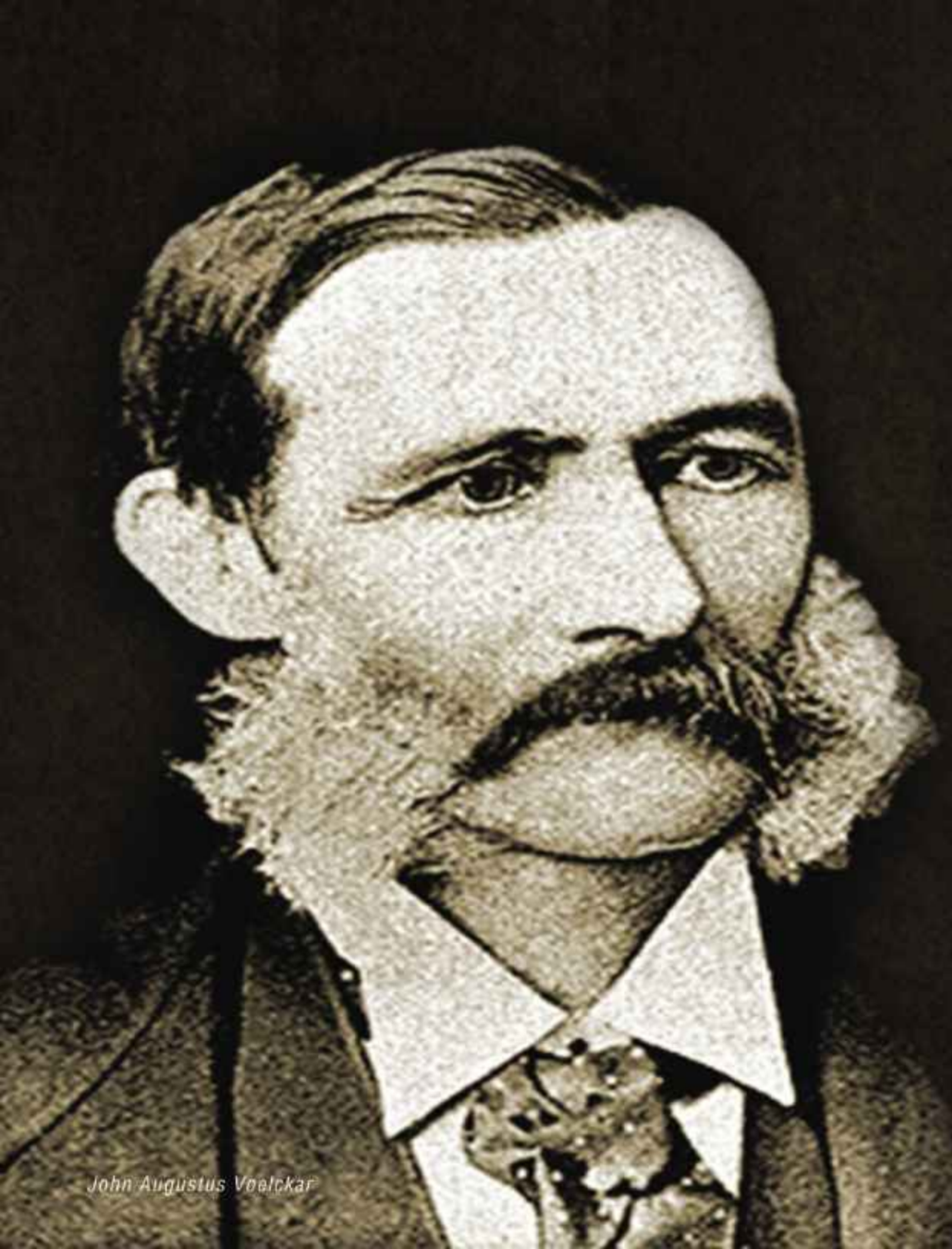


John Augustus Voelckar

One of the first tasks undertaken by the newly formed Forest Department was the survey and mapping of forests of India to enable the formulation and implementation of Working Plans based on principles of sustainable harvesting.

The scientific approach to forestry was strengthened in 1894 on the advice of German agriculturist, John Augustus Voelckar who stressed the importance of good forest cover to prevent environmental degradation that might otherwise impact upon agricultural output. The legislation generated from his advice become known as the John Augustus Voelckar Resolution.

Photo Courtesy: Gettyimages



John Augustus Voelckar

State control, which was a principal feature of the 1878 Forest Act, also facilitated the development of scientific forestry. Dietrich Brandis who was the first Inspector General of Forests of British India is widely acknowledged for laying the foundations of modern forestry. Indeed, he is often paid tribute to as the Father of Indian Forestry. Brandis was bestowed the title of Companion of the Indian Empire in 1878.

Brandis was a botanist from Bonn University in Germany, which was considered the leading European country in forest management at that time. After working ten years in Burma, Brandis became Inspector General of Forests in India, a position he served in for 20 years. Brandis' work included research on the scientific growth and propagation of important tree species viz.,Teak, developing forest protection strategies against the threats of pests infection and forest fires. He also introduced the establishment of managed teak areas called conservancies under the jurisdiction of officers who were appointed as Conservators.

He introduced scientific forestry in which trees of given forest area identified and harvested on the basis of a written plan for that forest, known as the Working Plan which prescribes for harvesting and restocking of timber in a manner to provide for sustainable yield of timber from a particular forest area.



Sir Dietrich Brandis (Father of Tropical Forestry)
at Sanjay Gandhi National Park, Mumbai

This principle is still relevant in modern day Working Plans.

Brandis documented the sacred groves in Rajputana and Kans (woodlands) of Mysore, the Garo and Khasi Hills which he visited in 1879, the Devarakadus of Coorg in 1868, the hill ranges of the Salem district in the Madras Presidency in 1882, the Swami Shola on the Yelagiris, the sacred grove at Pudur on the Javadis and several sacred forests on the Shevaroys. He was among the earliest in India to formally link forest protection with local people.

He formulated new forest legislation and helped establish research and training institutions.

The British Imperial Forest School was founded in 1878 by Dietrich Brandis. In 1906, it was re-established as the 'Imperial Forest Research Institute'(FRI), under the British Imperial Forestry Service (IFS). Within its campus it hosts the 'Indian Forest College' which was established in 1938; officers recruited to the Superior Forest Service by the states and provinces were trained there. Now by renaming the erstwhile Indian Forest College as Indira Gandhi National Forest Academy in the year 1987, the premier Institute is now where the Indian Forest Officers are trained at Dehradun. Also within the campus is the Central Academy for State Forest Services (CASFOS).

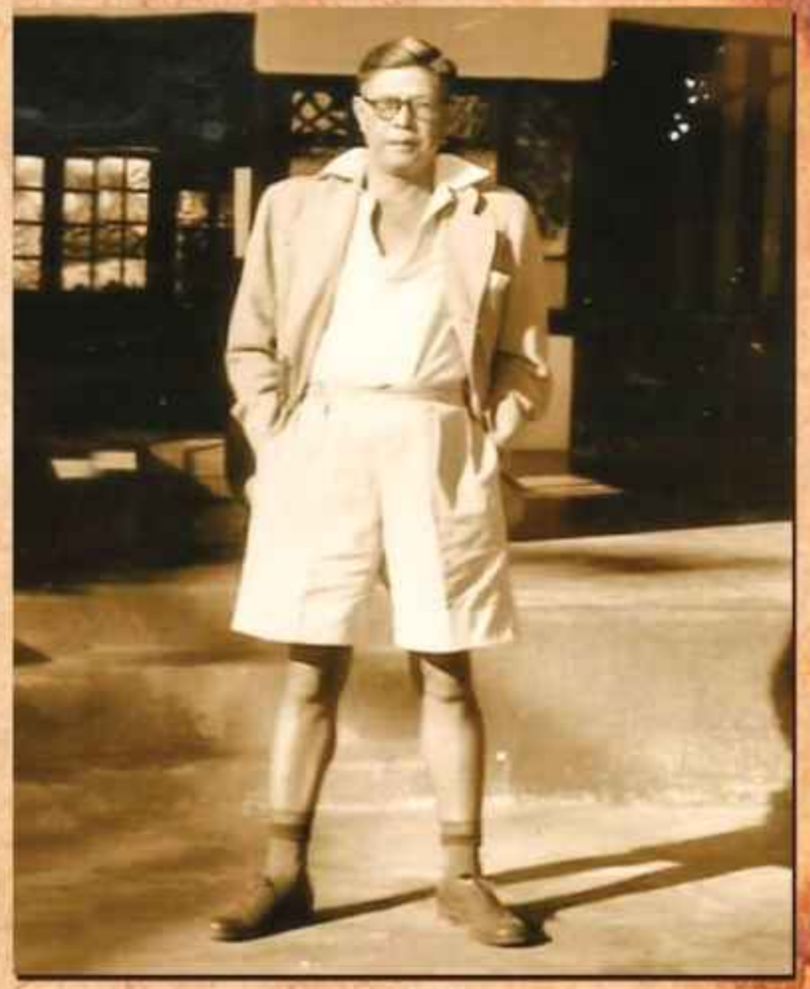
The Wildlife Institute of India previously was also within the campus but now has shifted to Chandrabani. IIFM is an independent autonomous organisation of MoEF and has good liaisoning with FRI for forestry research and related activities. The deemed university of FRI runs four MSc courses viz. Cellulose & Paper Technology, Environment Management, Forestry Management, Wood Science Technology and two P.G.Diploma courses in Natural Resource Management and Aroma Technology. It also enrolls large number of research scholars every year for PhD.

Archives from Meghalaya

Meghalaya has produced an eminent forest officer, Mr. Justman Swer from the Khasi and Jaintia Hills region. Mr Justman Swer after graduating from Scottish Church College, Calcutta during pre-independence entered the Forest Service in 1932. After completion of his Forest training in erstwhile Burma now Myanmar, in the city of Rangoon now Yangon from 1930 onwards, his first posting in the Forest Department after training was as Probationary Extra Assistant Conservator of Forest, on the 16th April 1932 at Lakhimpur District, Assam. From then on he served as ACF in Golagat, Makum, Dhubri, and Kutchugoan. He was the DFO of Darrang and Kamrup Forest Department. He was also involved in managing Kaziranga National Park and was instrumental in declaring Manas National Park into a Tiger Reserved which was inaugurated in 1973.

He retired as the Conservator of Forests in 1961-62. He was the first tribal officer to hold such post during composite Assam. After retirement, he was appointed as the first Managing Director of Forest Development Corporation of Meghalaya (FDCM).

He was also political figure of a giant stature. When Meghalaya became a State Mr. Justman Swer was nominated as the M.L.A in the Provisional Meghalaya Legislative Assembly 1970 and also nominated as M.D.C thereafter. He was the Chief Executive Member of the Khasi and Jaintia Hills District Council completing his full five years tenure as CEM.



Mr. Justman Swer the then Divisional Forest Officer of undivided Assam



Mr. Justman Swer seen displaying a pair of 9 feet elephant tusks to a British Naval Officer and his wife



Mr. Justman Swer seated extreme left amidst distinguished British Forest Officers during Pre-Independence

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