



সর্বান্মত সংযোগ



# GARPANCHKOT MEDICINAL PLANTS CONSERVATION AREA (MPCA) WEST BENGAL

# Spatial Distribution Map of Garpanchkot MPCA in West Bengal

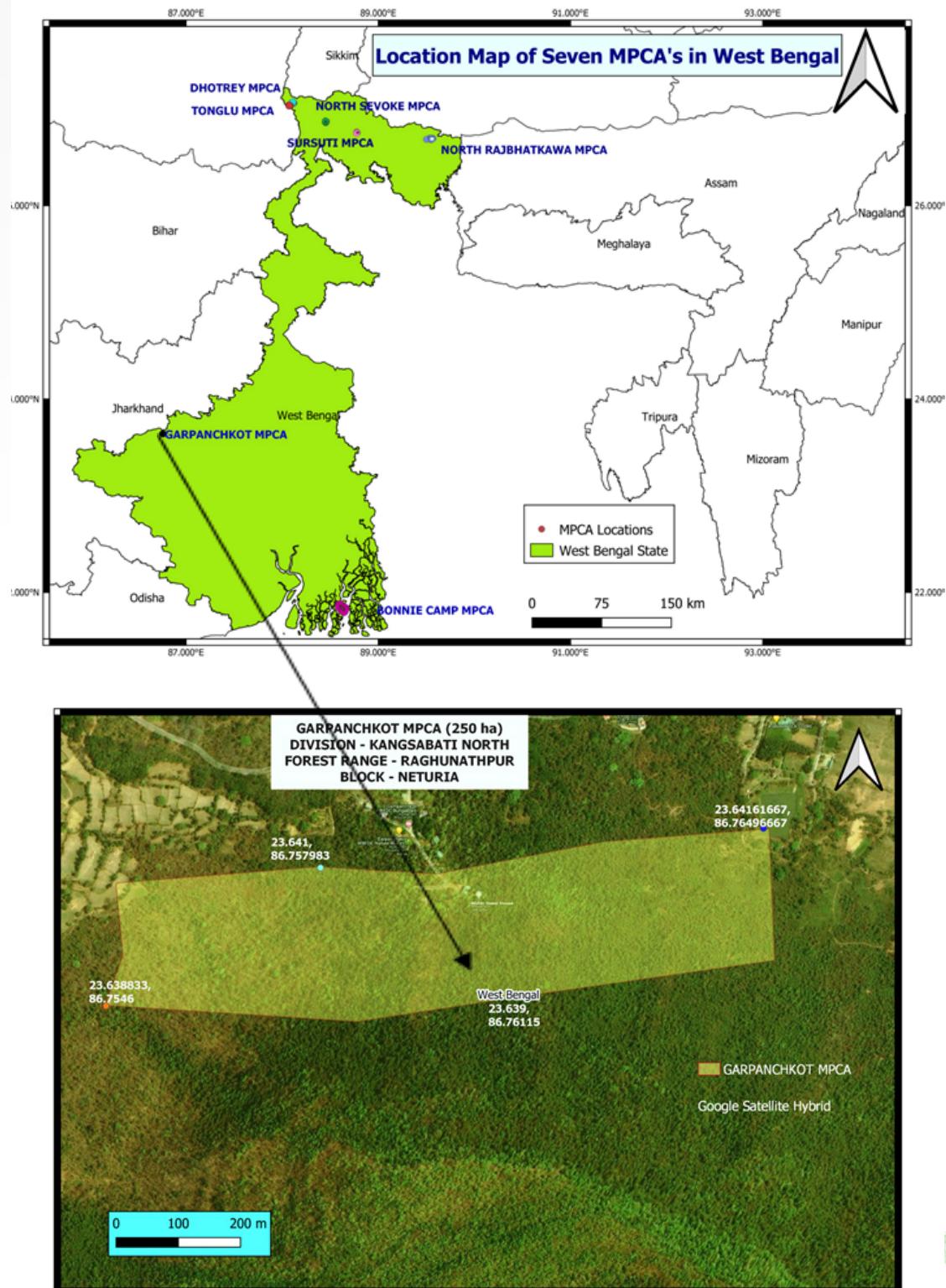


Fig. No.1: Spatial distribution Map of Garpanchkot demarcating the area under the MPCA.

# MPCAs as an inventive tool for Forest Biodiversity Conservation in West Bengal

The state of West Bengal is blessed with varied phytogeography that allows it to host a diverse range of plants and animals. The state has 11, 879 sq. km of forested area of which 39.50% is under protected area network. In 2007-09, seven (7) Medicinal Plant Conservation Areas (MPCAs) were established in the State for promoting Conservation of Medicinal Plants and Traditional Knowledge for enhancing health and livelihood security of the surrounding indigenous communities. In the face of global warming and climate change the MPCA's can act as buffers for carbon sequestration, habitat protection, gene pool conservation, health and poverty issues and other ecosystem services. Each MPCA can act as a permanent plot for future assessments on impact of climate change on forest ecosystems. Awareness regarding the objectives and presence of the MPCA is of paramount importance to meet the Sustainable Development Goals (SDGs) of United Nation. A pictorial guide book of the medicinal plants of the MPCA's and their IUCN (International Union for Conservation of Nature) status as well as CAMP (Conservation Assessment Management Plan) status is a prerequisite for facilitating the conservation initiatives of every MPCA.

Of the 7 MPCA's in the State of West Bengal; three were established in North Bengal, namely North Sevoke, Sursuti and North Rajabathkhawa MPCA; two in Darjeeling Hills namely Dhotrey and Tonglu MPCA and two in South Bengal namely Bonnie Camp in Sundarbans and Garpanchakot in Purulia. The Garpanchakot MPCA has an area of 250 ha in the Raghunathpur Forest Range of Neturia Block in the Kangsabati North Division of Purulia.

Table 1. Community, Phytogeographic, Climatic, Edaphic and Administrative profile of Garpanchakot MPCA.	
Community	
The people residing adjacent to the MPCA are Santhals as well as upper caste Bengali Brahmins.	The major livelihood sources were daily wage coal field labour in the nearby hydro-electric power plant, farming, grazing, teaching and few govt. jobs.
Phytogeography	
Lat- N 23063' Long- E 860 76' Elevation- 643 m asl Forest Type – As per Champion & Seth's Classification: Tropical Dry Deciduous	Dominant tree species (as per IVI values) <i>Terminalia anogeissiana</i> <i>Lagerstroemia parvifolia</i> <i>Shorea robusta</i> <i>Terminalia alata</i> <i>Careya arborea</i> <i>Semecarpus anacardium</i> <i>Lannea coromandelica</i> <i>Aegle marmelos</i> <i>Alangium salvifolium</i> <i>Croton persimilis</i>
Climatic Condition	
Temperature in oC Max – 45 Min- 09 Average Rainfall (mm): 1375.2 unit	Spring- January to February Summer- March-May Monsoon- June-September. Winter –October to January
Edaphic Condition	
The sedimentary rocks give a sandy, loose soil.	
Administration	
The MPCA comes under Protected Forests. The MPCA comes under Biodiversity and Wildlife Conservation and Preservation Working Circle and is managed by the Forest Protection Committee (FPC).	The Forest department has an office and guest house adjacent to the MPCA. The Garpanchakot WBFDC Nature Resort is also adjacent to the MPCA and offers an opportunity for eco-tourism.



The Garpanchot MPCA harbours 325 medicinal plants. About 10 plants of this group are under the threatened category. A large number of plants have been reported to show small population size and considered as rare in this MPCA (Table 2)

Table 2: Medicinal plants of conservation concern in Garpanchokot MPCA

Sl. No.	Sc. Name	Family	Habit	Status
1.	<i>Albizia odoratissima</i> (L.f.) Benth.	Fabaceae	Tree	Rare
2.	<i>Ampelocissus latifolia</i> (Roxb.) Planch.	Vitaceae	Climber	Rare
3.	<i>Aristolochia indica</i> L.	Aristolochiaceae	Climber	Less common, Vulnerable
4.	<i>Asparagus racemosus</i> Willd.	Asparagaceae	climber	Common, Endangered
5.	<i>Butea monosperma</i> (Lam.) Taub. var. <i>lutea</i> (Witt.) Maheshwari	Fabaceae	Liana	Rare
6.	<i>Butea superba</i> Roxb. ex Willd.	Fabaceae	Liana	Rare
7.	<i>Cayratia pedata</i> (Lam.) Gagnep.	Vitaceae	Climber	Rare
8.	<i>Desmodium volubile</i> (Schindl.) B. G. Schub. & McVaugh	Fabaceae	Herb	Rare, Vulnerable
9.	<i>Dillenia pentagyna</i> Roxb.	Dilleniaceae	Tree	Rare
10.	<i>Erycibe paniculata</i> Roxb.	Convolvulaceae	Climber	Rare
11.	<i>Globba marantina</i> L. Syn. <i>Globba bulbifera</i> Roxb.	Zingiberaceae	Herb	Rare
12.	<i>Gloriosa superba</i> L.	Colchicaceae	Climber	Rare, Vulnerable
13.	<i>Grewia rhamnifolia</i> B.Heyne ex Dunn	Malvaceae	Shrub	Rare
14.	<i>Gymnema sylvestre</i> (Retz.) R. Br. ex Sm.	Apocynaceae	Climber	Common, Vulnerable
15.	<i>Habenaria diphylla</i> (Nimmo) Dalzell	Orchidaceae	Herb	Rare
16.	<i>Hymenodictyon orixense</i> (Roxb.) Mabb.	Rubiaceae	Tree	Rare
17.	<i>Jacquemontia paniculata</i> (Burm.f.) Hallier f.	Convolvulaceae	Climber	Rare
18.	<i>Miliusa velutina</i> (DC.) Hook.f. & Thomson	Annonaceae	Tree	Rare
19.	<i>Morinda citrifolia</i> L.	Rubiaceae	Tree	Common, Vulnerable
20.	<i>Mucuna pruriens</i> (L.) DC.	Fabaceae	Climber	Common, Endangered
21.	<i>Ochna pumila</i> Buch.-Ham. ex DC.	Ochnaceae	Shrub	Rare
22.	<i>Olax nano</i> Wall. ex. Benth.	Olacaceae	Shrub	Less Common, Vulnerable
23.	<i>Oroxylum indicum</i> (L.) Kurz	Bignoniaceae	Tree	Rare
24.	<i>Pterocarpus marsupium</i> Roxb.	Fabaceae	Tree	Less Common, Endangered
25.	<i>Santalum album</i> L.	Santalaceae	Tree	Rare
26.	<i>Schleichera oleosa</i> (Lour.) Oken	Sapindaceae	Tree	Rare
27.	<i>Suregada multiflora</i> (A.Juss.) Baill.	Euphorbiaceae	Small tree	Rare
28.	<i>Viscum orientale</i> Willd.	Santalaceae	Stem parasite	Rare
29.	<i>Ziziphus rugosa</i> Lam.	Rhamnaceae	Shrub	Rare

Rare (<50 plants), Less common (< 100 plants), Common (<500 plants), NR (Newly Recorded).

In Garpanchot MPCA *Asparagus racemosus*, *Mucuna pruriens*, *Morinda citrifolia* and *Gymnema sylvestre* that are in the threatened category are found to occur commonly with a large population. This MPCA acts as a genepool for *Aegle marmelos* which is one of the 10 dominant tree species of the MPCA. Other endangered and vulnerable species that are less common or found rarely are *Aristolochia indica*, *Desmodium volubile*, *Gloriosa superb* and *Pterocarpus marsupium*.

The community adjacent to the Garpanchot MPCA used medicinal plant parts growing in the neighbourhood of the MPCA to treat ailments such as jaundice, pneumonia, fever, joint pain, bone fracture, skin disease, scabies, arthritis, ulcer, stomach ailment, gynecological problems and as food item (Table 3).

Table No. 3: Traditionally used medicinal plants in the neighbourhood of the Garpanchot MPCA

Botanical name	Local Name	Medicinal use	Local use/traded
<i>Aegle marmelos</i>	Bael	Leaf juice is given in empty stomach for acidy; fruits help as laxative..	Local use/traded
<i>Andrographis paniculata</i>	Kalmegh	Used against liver trouble, jaundice and worm; roots used to treat general debility, dyspepsia; whole plant used in fever.	Local use/traded
<i>Aristolochia indica</i>	Ishwamul	Roots used to prevent seizures, boost the immune system and as aphrodisiac	local use
<i>Asperagus racemosus</i>	Satamuli	Tubers used in blood dysentery; to enhance the production of mother's milk.	Local use/traded
<i>Azadirachta indica</i>	Neem	Seed oil is used in case of skin disease; leaves are boiled and orally given for worms.	Local use/traded
<i>Calotropis gigantea</i>	Akaona/Madar	Warm leaves applied externally on swollen part or painful area of body or for joint pain.	local use
<i>Carissa spinarum</i>	Benchi/ Karonda/Khunti	Roots used against asthma; leaves paste applied for swollen mouth in cattle; roots applied for skin disease of cattle.	local use
<i>Centella asiatica</i>	Thankuni	Leaves are chewed and eaten to check gastric and acidity .problems	Local use/traded
<i>Curculigo orchiooides</i>	Talmuli	Roots used in treatment of impotence; also, in arthritis of the lumbar and knee joints.	Local use/traded
<i>Desmodium gangeticum</i>	Titakhari/Urssha	Used as aphrodisiac; in postnatal complaints, chronic fever, cough and asthma.	local use
<i>Dioscorea alata</i>	Kham aloo	Tubers are used in leprosy, burns, fungal diseases, rheumatism and as contraceptive.	Local use/traded
<i>Dioscorea bulbifera</i>	Bon alu	Tubers used in treatment of piles, dysentery, syphilis, ulcers, leprosy; also used in cough and asthma.	Local use/traded
<i>Euphorbia hirta</i>	Dudhia/Lal keru	Plant juice used in dysentery, bowel complaints.	Local use/traded
<i>Gloriosa superba</i>	Dushtina/ Jhagar/ Ulatchandal	Leaf paste applied for skin disease; roots used as snakebite antidote and in treating small pox, impotence and infertility.	local use
<i>Helicteres isora</i>	Gamochra	Roots decoction is given to check diarrhoea; fruits boiled with mustard oil for baby massage.	Local use/traded
<i>Hemidesmus indicus</i>	Anantamul	Roots are used broadly in kidney troubles; used against general debility.	local use
<i>Ichnocarpus frutescens</i>	Shyamlaata	Whole plant used to treat dysentery, bleeding gums, convulsions, cough and measles.	local use
<i>Lannea coromandelica</i>	Doka	Bark, stem and leaves used to treat fever, dyspepsia, general debility; also used in leprosy, ulcers, wounds.	Local use/traded
<i>Nasturium officinale</i>	Simrayo	Leaves boiled and given in T.B. and chest pain; jaundice; raw leaf juice given in tuberculosis.	Locally used
<i>Panax-pseudo ginseng</i>	Salaney	Rhizome gives good health and used as aphrodisiac.	Locally used
<i>Paris polyphylla</i>	Satwa	Roots used as antidotes; for treatment of boil.	Locally used
<i>Picrorhiza kurrooa</i>	Kutki	Roots and rhizome used in body ache and fever.	Locally used
<i>Podophyllum hexandrum</i>	Papari	Plant used for treatment of skin scars; used in gynaecological infections and other sexual infections; roots as blood purifier.	Locally used
<i>Swertia chirayita</i>	Chiroto	Whole plant used in fever.	Locally used
<i>Taxus wallichiana</i>	Dhangre Salla	Cancer, joint pain, decoction of leaves in body pain; decoction given in high blood pressure.	Locally used, traded

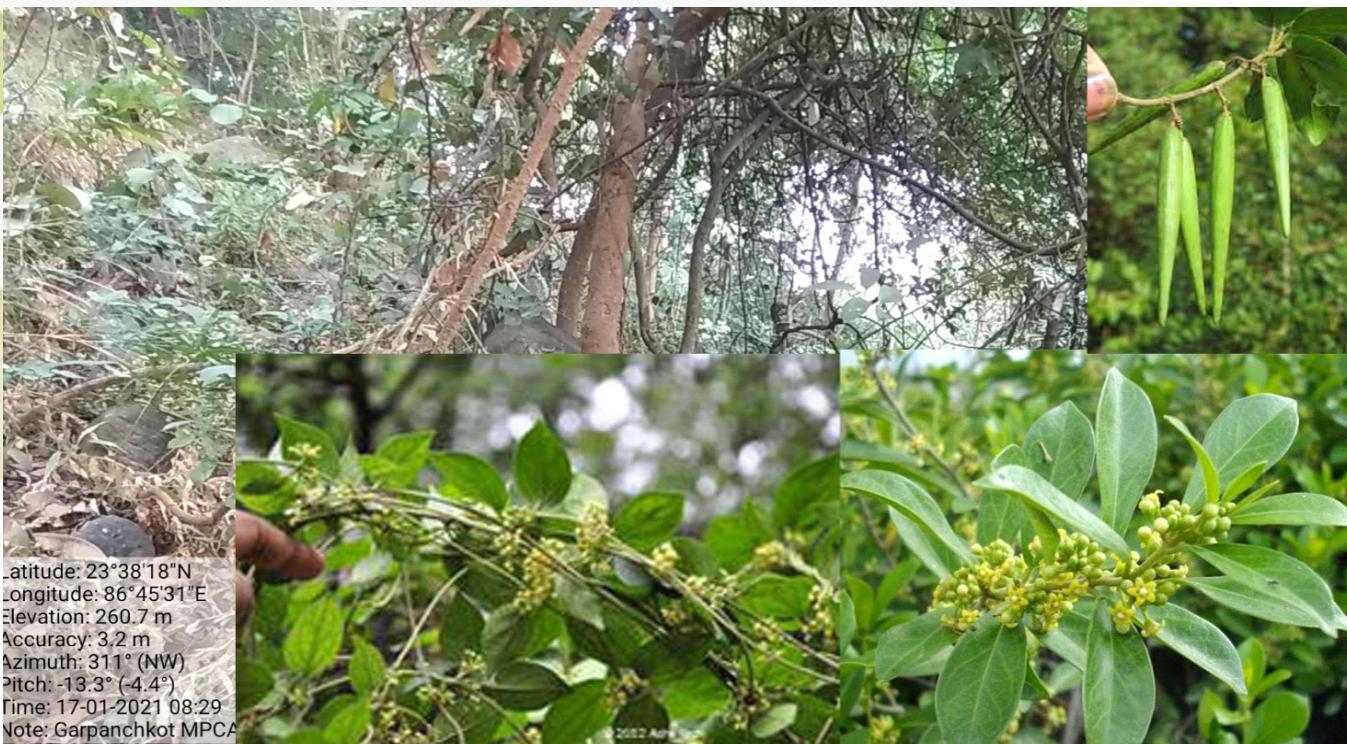
Alternate livelihood sources can be generated by the local people by creating home nurseries of medicinal plants. Further, value addition to medicinal plant part can reduce extraction pressure to the local biodiversity and also improve local economy. The MPCA can act as a major ecological and economic tool for the sustainable development of surrounding areas specially with respect to various ecosystem services.

### *Gloriosa superba L.*



Common Name	Creeping Lily, Glory Lily
Family	Colchicaceae
Habitat and Distribution	A paleotropical species found in Africa, Madagascar, India, Indochina and Malaysia. Within India it grows in tropical region specially in moist deciduous forests.
Ecology:	The pollinators are butterflies and sunbirds. The plant grows in various habitats, even in nutrient-poor soils upto 2,500 m elevation.
Threat status	Vulnerable (VU)
Description	This a herbaceous perennial grows from a fleshy rhizome. It is scandent, climbing using modified leaf-tip tendrils, the stem reaching 4 m long. The red to orange showy flower has six tepals each up to 5 to 7.6 cm long with wavy margin. The fruit is a fleshy capsule up to 6 to 12 cm long containing red seeds.
Flowering and fruiting	Flowering during July to October
Uses	Leaves paste applied for skin disease; roots against snakebites and small pox; for impotence and infertility;
Trade information	Seeds are being officially exported. The market demand and price has been on rise since 2005. This is one of the highly traded species. The total domestic consumption by the herbal industries is around 100-200MT.
Propagation and cultivation	The plant is propagated sexually by seed or vegetatively by rhizome. Problems during cultivation include inadequate pollination, fungal diseases such as leaf blight and tuber rot, and crop pests and slow propagation

## *Gymnema sylvestre* (Retz.) R.Br. ex Sm.



Common Name	Australian Cowplant, Kavali, Madhunasini, Periploca Of Woods, Gurmar
Family	Apocynaceae
Habitat and Distribution	Globally the species is distributed in the tropical regions of Africa and Asia and in the Central and Peninsular India. Common in the Western Ghats.
Ecology:	<i>Gymnema sylvestre</i> is a medicinal plant; it is a slow-growing, perennial, woody climber found in Central and Southern India and tropical Africa.
Threat status	Vulnerable (VU)
Description	The plant is a climber with elongated-oval leaves, 3-5 cm long having soft hairs on the upper surface. It has a small, yellow, umbelliferous inflorescence that is produced throughout the year. Chewing the leaves temporarily reduces sweetness sensation.
Flowering and fruiting	Flowering occurs in October–January, while fruits mature from March to May.
Uses	Used in treatment of diabetes, obesity, rheumatism, arthritis, skin problems, osteoporosis, inflammation of blood vessels, hemorrhoids, asthma and snakebites.
Trade information	The top 3 exporters of <i>Gymnema sylvestre</i> are India, Romania and United States. India is the largest exporter of <i>Gymnema sylvestre</i> .
Propagation and cultivation	Terminal and axillary cuttings with three to four nodes from one-year-old plants are the best planting material. Seed germination is poor; hence, plants are preferably raised vegetatively through cuttings.

## *Mucuna pruriens* (L.) DC.



Common Name	Monkey Tamarind, Velvet Bean, Bengal Velvet Bean, Kiwach, Akolchi
Family	Fabaceae
Habitat/Distribution	It is found in tropical Africa, India and the Caribbean. In India, it is found in the Himalayas, at altitudes of 150-1200 m and Western Ghats.
Ecology:	The plant is a legume, it fixes nitrogen and fertilizes soil.
Threat status	Endangered (EN)
Description	Plant is annual climber attaining over 15 metres in length. Young plant is completely covered with hairs; older plants are without hairs. Leaves tripinnate and mostly ovate. Flowers white and lavender, or purple. Pods about 10 cm long, covered in loose, orange hairs that cause a severe itch to human skin.
Flowering & Fruiting	Vines flower after 120-125 days and continue reproduction till 180-200 days.
Uses	Pods are high in levodopa which helps maintain healthy cholesterol and blood sugar levels. Seed powder used to treat Parkinson's disease.
Trade information	Locally collected and sold in local market. Domestic consumption is greater than 1073 MT/ year.
Propagation and cultivation	The seeds treated with fungicide are raised directly in the field.

## *Tinospora cordifolia* (Willd.) Hook.f. & Thomson

Common Name	Gurjo, Heart-Leaved Moonseed, Guduchi or Giloy
Family	Menispermaceae
Habitat and Distribution	The species is endemic to India and is common throughout tropical and subtropical zones at an altitude of 600 m.
Ecology:	Endophytic fungi colonize the living, internal tissues of their host without causing any harmful effects.



Threat status	Vulnerable (VU)
Description	Large, deciduous, extensively-spreading, climbing shrub. Leaves simple, chordate, alternate. Flowers unisexual, small, greenish-yellow on axillary and terminal racemes on separate plants before leaf flush. Male flowers are clustered, but female flowers are usually solitary. Fruits small, ovoid, red, aggregate in clusters of one to three.
Flowering and fruiting	Flowering occurs in May–June, while fruiting is witnessed in September–October.
Uses	Treats diabetes, high cholesterol, allergic rhinitis (hay fever), upset stomach, gout, lymphoma and other cancers, rheumatoid arthritis, hepatitis, peptic ulcer disease, fever, gonorrhea, syphilis, and to boost the immune system.
Trade information	Demand for stem in domestic herbal market is over 3845 MT/year.
Propagation and cultivation	Stem cuttings are the best planting material for raising nursery crop. The plant can also be raised using seeds. Seeds take almost more than double the time to mature.

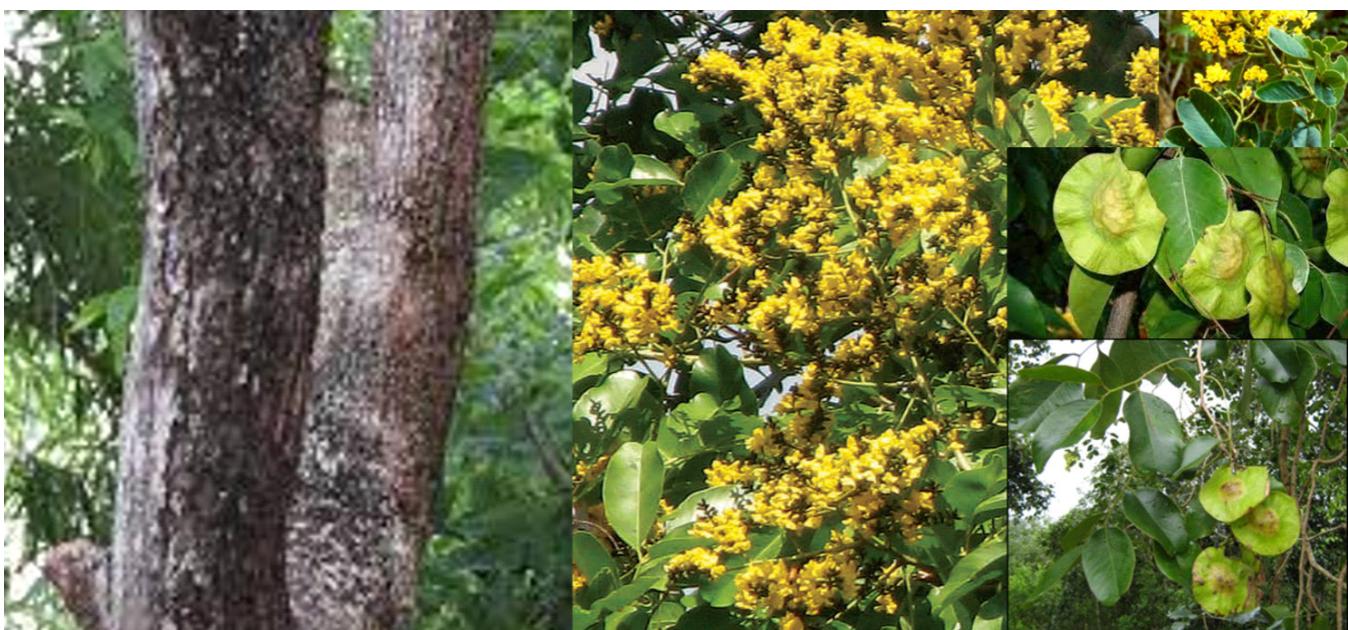
### *Ophioglossum reticulatum L.*

Common Name	Adder's-tongue fern
Family	Ophioglossaceae
Habitat and Distribution	Plant is pantropical in distribution and widespread in Africa. It is found throughout India.
Ecology	It grows in moist sandy soils, seasonally wet soils, along roads, on termite hills, in montane grassland among rocks and forest margins, from sea-level up to 2500 m altitude.
Threat status	Endangered (EN)
Description	Terrestrial herbs of about 10-20 cm long with fleshy small, sub-globose, subterranean rhizome, 1 x 0.8 cm. Fronds bipartite; sterile blade 5 x 4 cm, ovate, obtuse, fertile spike 5-10 cm; oblong, acute, flattened, fleshy with wavy margins. Sporangia globose, sunken, arranged in a row on either side of the stalk.



Flowering and fruiting	When grown from spores, plants can be harvested for their leaves after 1- 2 years.
Uses	Young fronds are commonly eaten as a salad or vegetable and has anti-inflammatory properties. A warm decoction of the rhizome is applied on boils. The leaf juice is used in heart spasms.
Trade information	Locally collected and sold in local markets only.
Propagation and cultivation	It can be propagated from spores and by rhizome cuttings.

### *Pterocarpus marsupium Roxb.*



Common Name	Vijaysar, Bijasar
Family	Fabaceae
Habitat and Distribution	The tree is found in dry mixed deciduous tropical forests of Gujarat, Madhya Pradesh, and sub- Himalayan tracts, at up to 1000 m altitude. Natural populations have greatly declined.
Ecology:	The tree occurs in tropical region and thrives well in open sun under moderate rainfall of 80–200 cm. It prefers fertile, deep clayey loam soil with good drainage. It can tolerate excessive temperatures in summer
Threat status	Endangered (EN)
Description	Trees have straight bole upto 30 cm height and 2.5 cm girth, longitudinally fissured bark, imparipinnate and elliptic leaves, fragrant yellow flowers in long large panicles. Pods are flat, orbicular, winged, and up to 5 cm in diameter. Seeds are one to three in number, bony and convex in shape.
Flowering and fruiting	Flowering begins in November, while fruiting continues up to March
Uses	Heartwood is antibiotic and hypoglycaemic and treats diabetes. Bark gum treats diarrhoea and haemorrhage. Leaves treat boils, flowers as febrifuge.
Trade information	Domestic market has a demand of over 522 MT/year.
Propagation and cultivation	Freshly collected seeds are used for raising the plantations.

### *Aristolochia indica L*



Common Name	Indian Birthwort, Ishwaramooli
Family	Aristolochiaceae
Habitat and Distribution	Grows in shaded areas in thick forests of India, Nepal, Bangladesh and Sri Lanka.
Ecology:	Seeds are winged and dispersed by wind. The population of this species is declining due to habitat fragmentation and indiscriminate collection.

Threat status	Endangered (EN)
Description	Plant is a climber with oblong leaves of various size. The perianth is globose at base and extends upwards as a column that ends in expanded coloured tongue. Fruit is a dehiscent capsule with 6 valves.
Flowering and Fruiting	July to March
Uses	Leaves and tender shoots are used to treat snakebite, fever, bone fracture, intestinal pain, gall bladder pain, arthritis, rheumatism, weight loss and wounds,
Trade information	Not traded from the area.
Propagation and cultivation	Propagate by seeds and roots.

### *Asparagus racemosus* Willd.



Common Name	Satamuli/ Satmul
Family	Liliaceae
Habitat and Distribution	Distributed in the tropical regions of the old world. In India, it is found in the tropical and sub-tropical regions including Andaman Islands.
Ecology:	This species grows well in sandy loam fertile soil under shade.
Threat status	Endangered (EN)
Description	It is a scandent undershrub, a perennial climber growing on other standing shrub branches. Roots stock consists of several fleshy tubers around 10-50 cm long. Stems are cylindrical and green with spines. Leaves are small and reduced to scales. Flowers are white about 8 mm across and borne on dense, racemose inflorescence. Fruits are berries, globose with 3-6 seeds.
Flowering and Fruiting	September to January
Uses	Roots are used in diarrhoea, piles, menorrhagia, internal haemorrhage, gout defects of vision, poisoning and as a health rejuvenators; tubers are good for lactating mother; leaves used to treat night blindness.

Trade information	One of the highly traded medicinal plants of India. Around 3000- 3200 MT /Year are consumed by the domestic herbal industries.
Propagation and cultivation	Propagated by both tubers and seeds.

### *Morinda citrifolia L*



Common Name	Indian Mulberry, Noni , Taakote, Surangi , Pindre , Hurdi ,Bartondi
Family	Rubiaceae
Habitat and Distribution	Plant grows in evergreen, semi-deciduous and even arid regions. Plant has pantropical distribution but native of tropical and subtropical Asia and Australia, .
Ecology:	Weaver ants make nests from the leaves of the tree and protect the plant from some plant-parasites. The smell of the fruit attracts fruit bats and help in seed dispersal. The fruit fly, <i>Drosophila sechellia</i> , feeds exclusively on these fruits.
Threat status	Vulnerable (VU)
Description	Plant grows upto 9 m tall with large, simple, shiny leaves. Flowers are small and white. The fruit is oval 4-7 cm, many seeded with pungent odour.
Flowering and fruiting	It reaches maturity in about 18 months, then yields between 4 and 8 kg of fruit every month throughout the year.
Uses	The fruit produces a variety of beverages, powders, cosmetic products and seed oil. It is also used to treat cancer, gastric ulcers and depression,
Trade information	Market annual sales of <i>M. citrifolia</i> products claimed to reach upto U.S \$1.3 billion.
Propagation and cultivation	It can be propagated from either seeds or stem cutting.

## *Aegle marmelos* (L.) Correa



Common Name	Bael, Bengal quince, golden apple, stone apple or wood apple,
Family	Rutaceae
Habitat and Distribution	<i>Aegle marmelos</i> is native across the Indian subcontinent and Southeast Asia, and is cultivated throughout Sri Lanka, Thailand, and Malaysia. It occurs in dry, open forests on hills and plains.
Ecology:	The tree is a larval food plant for the following two Indian Swallow tail butterflies: the lime butterfly ( <i>Papilio demoleus</i> ) and the common Mormon ( <i>Papilio polytes</i> ).
Threat status	Not Evaluated (NE) in West Bengal; Near Threatened (NT), Globally (G)
Description	It is a deciduous shrub or small to medium-sized tree, up to 13 metres tall with slender drooping branches and rather open, irregular crown. The bark is pale brown or greyish, smooth or finely fissured and flaking with slimy sap oozing from cuts. Stems with long straight spines, single or in pairs, often. Leaves trifoliate, alternate, ovate with tapering or pointed tip and rounded base.
Flowering and fruiting	The fruit takes about 11 months to ripen on the tree, reaching maturity in December.
Uses	The leaves, bark, roots, fruits, and seeds are used in traditional medicine to treat various illnesses. Rich in vitamin C, the fruits can be eaten either fresh. Used as laxative.
Trade information	Fruits traded in local markets. In national markets there is demand of over 2939 MT/year of the fruit and root.
Propagation and cultivation	It is by root cuttings and stem cuttings treated with IBA (4000 ppm). Seedlings or budded plants are transplanted in the field during rainy season.

## *Andrographis paniculata* (Burm.f.) Nees



Common Name	creat or green chiretta, Kalmegh
Family	Acanthaceae
Habitat and Distribution	It is distributed in tropical Asian countries, often in isolated patches. It is found in plains, hillsides, coastlines, roadsides and farms.
Ecology	It is a hardy species and can grow in sandy loam to clay-loam soils, with irrigation. It is shade loving but grows in open field too.
Threat status	Not Evaluated (NE)
Description	The plant has slender erect stem of 30–110 cm height. Stem is dark green, square in cross-section with longitudinal furrows and wings along the angles. The lance-shaped leaves have hairless blades measuring up to 8 x 2.5 cm. Flowers are pink, solitary, arranged in lax spreading racemes or panicles. The fruit is a capsule around 2 cm long and a few millimeters wide. it contains many yellow-brown seeds. The seeds are subquadrate, rugose and glabrous.
Flowering and fruiting	The flowering time is September to December
Uses	Leaves and whole plant are traditionally used in India and China for the <b>common cold, influenza</b> and <b>vermifuge</b> .
Trade information	Locally used and traded.
Propagation and cultivation	It can be easily raised through seed and vegetative methods. But in commercial cultivation, propagation through seed is easy and economical.

## *Butea monosperma* (Lam.) Kuntze



Common Name	Flame of the Forest, Polash
Family	Fabaceae
Habitat and Distribution	Native to tropical and sub-tropical parts of the Indian Subcontinent and Southeast Asia. Found throughout the drier parts of India, often gregarious in forests, open grasslands and wastelands.
Ecology:	Leafless tree flower gregariously in rainy season. Birds are the chief pollinators. The tree is very resistant to drought, frost and grazing and can grow in open space..
Threat status	NE
Description	Small to medium-sized deciduous tree upto 5-15 m tall; trunk usually crooked and tortuous, bark greyish-brown, branchlets densely pubescent. Leaves trifoliate, leathery. Flowers bright orange-red with papilionaceous corolla in racemes 5-40 cm long. Fruit brown indehiscent pod, 17-24 x 4-6 cm m. Seed ellipsoid, flattened.
Flowering and Fruiting	January to March
Uses	The flowers are useful in the treatment of liver disorders and seeds act as an anthelmintic. Butea bark exudates an astringent gum used to treat diarrhoea.
Trade information	The domestic market requires seeds over 463 MT/year.
Propagation and cultivation	The trees pollard and coppice well and produce root suckers. It can reproduce from seed and root suckers. Seedlings thrive best on a rich loamy soil with pH 6-7 under high temperature and relative humidity.

## *Terminalia chebula* Retz..



Common Name	Black- Or Chebulic Myrobalan, Haritaki, Halela Zard ,Harar, Harra, Harad
Family	Combretaceae
Habitat and Distribution	The plant is distributed in South Asian countries. It grows well in the Himalayan zones up to an elevation of 1500 m. in mixed dry deciduous forests.
Ecology:	<i>Apis indica</i> is the main pollinator along with other insect visitors.
Threat status	NE in West Bengal; Least Concern (LC) (G)
Description	Deciduous tree upto 25 m height. Bark exfoliating. Leaves sub-opposite, ovate or oblong. Flowers yellowish-white in panicles, odour pungent Fruit (drupe) yellowish-green, obovoid or ellipsoid, hard, five to six ribbed when dry.
Flowering and Fruiting	Flowering occurs in May–June, while fruiting occurs in winter (November–March).
Uses	Fruit antiseptic, diuretic, astringent, cardiotonic and febrifuge. Important ingredient of 'triphalā'.
Trade information	Domestic market has a demand for mature and immature fruit for above 8158 MT/year.
Propagation and cultivation	Seed is the most appropriate material for this plant's propagation.

## UTILITY OF THIS PICTORIAL GUIDE

Garpanchot MPCA comes under the Purulia District which is bestowed with enormous gifts of nature. This whole area falls in the Garpnachot Hillock which is an important watershed as well as a biodiversity rich zone. This unique ecosystem harbours the most important and magnificent forest having rich genepools of many threatened species. It has immense value with respect to various ecosystem services such as climate regulation, carbon sink, soil reclamation, water supply, nutrient cycling, pollination, recreation, aesthetic value and livelihood for many local communities.

This guide booklet will help one to know about the important plants, their global distribution, medicinal uses, issues related to various threats to these plants and the dependence of local communities on the forest resources such as food, fuelwood, fodder, medicines, honey and many other non-timber forest products (NTFPs).

This book also provides a glimpse of the MPCA in a nutshell. It will allow quick identification of important medicinal plants through their photographs for the field staff from the Forest Department. The list of threatened and less commonly occurring species provides a blue print to the Forest Department for short listing species of conservation concern. The list of traditionally used medicinal plants can promote the sharing of traditional medicinal knowledge among the younger generation of residents neighbouring the MPCA, as well as for researchers, foresters, traders and others. The list of dominant tree species according to their Importance Value Index (IVI) gives a fair idea of the structure and composition of the community and tree species in the MPCA. Finally, this guide book can create awareness regarding the importance of MPCA and facilitate informed Biodiversity Conservation action programs of West Bengal.

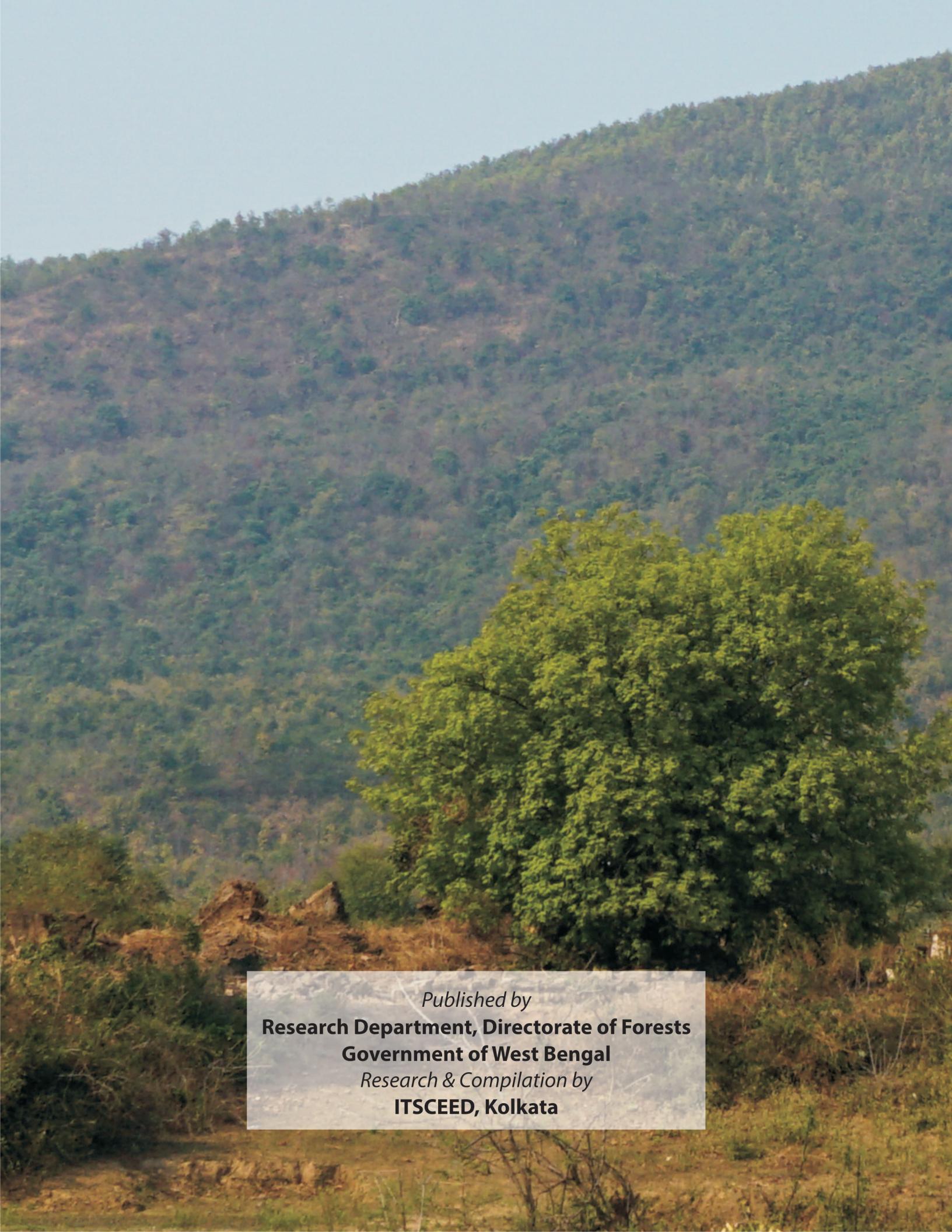
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