

GREEN AUDIT REPORT  
OF  
UNIVERSITY OF NORTH BENGAL



University of North Bengal, Rajarammohunpur, Siliguri, West Bengal, 734013

*Prepared by*

University of North Bengal

**2022-2023**

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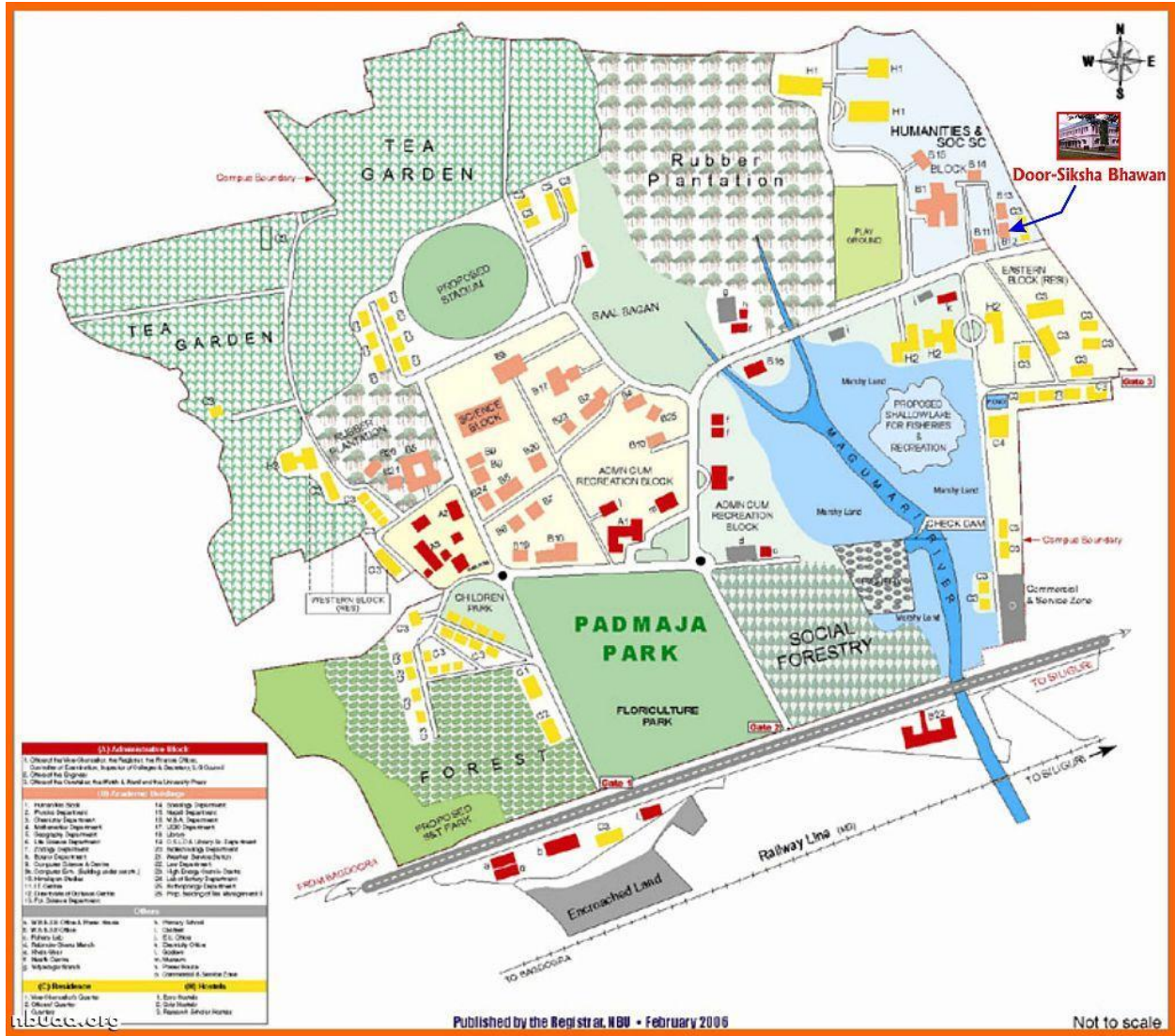


## SUMMARY

Green auditing or environmental auditing is the interchangeable terms. Green auditing is the process of identification and determination of institutions' practices are benign to environment and sustainable. Objective to carry out a green audit is to formulate eco-friendly practices to be followed by the university authority and by its stake holders. A well-studied audit report helps to understand, where actually the existing practices of the University stand in an environment-friendly scale. The said report thus can identify the areas of improvement in the light of eco-friendly sustainable goal. University of North Bengal has taken the initiative to conduct green audit of the University Campus. The green audit was based on the guidelines, rules, acts, and formats set by the Government of India, Ministry of Environment and Forest, New Delhi, and Central Pollution Control Board, New Delhi.



# Landscape & Land Use





University of North Bengal Campus [Geo-Location]

### Location

The North Bengal University Campus is situated at the Mechi-Balason interfluves and is traversed by the river Magurmari along the east central part and by the river Lachka along the western boundary. The NBU Campus presently occupies an area of 133.381 hectare (1.3338 sq.km.) of Bairatishal (J.L. No. 79) and Bara Mohan Singh (J.L. No. 96) mauza of Siliguri Police Station in Darjeeling district of West Bengal. The location extents of the NBU campus is from 260 42'18.73" to 260 43°0.32" latitudes and 880 20'37.09" to 880 21°42.68'longitudes. The geographic set-up of the North Bengal University campus in the midst of the undulating Terai not far from the Himalayan foothills is unique of its kind. The revulet Magurmari which meanders diagonally through the campus along with its wide channel added landscape diversity of aesthetic value.

### Climate/Weather Conditions:

Climate of the NBU Campus is dominated by two seasons i.e., winter and rainy. However, another two relatively short spanned seasons namely spring and autumn are also noticed.

**Seasonal Temperature:**

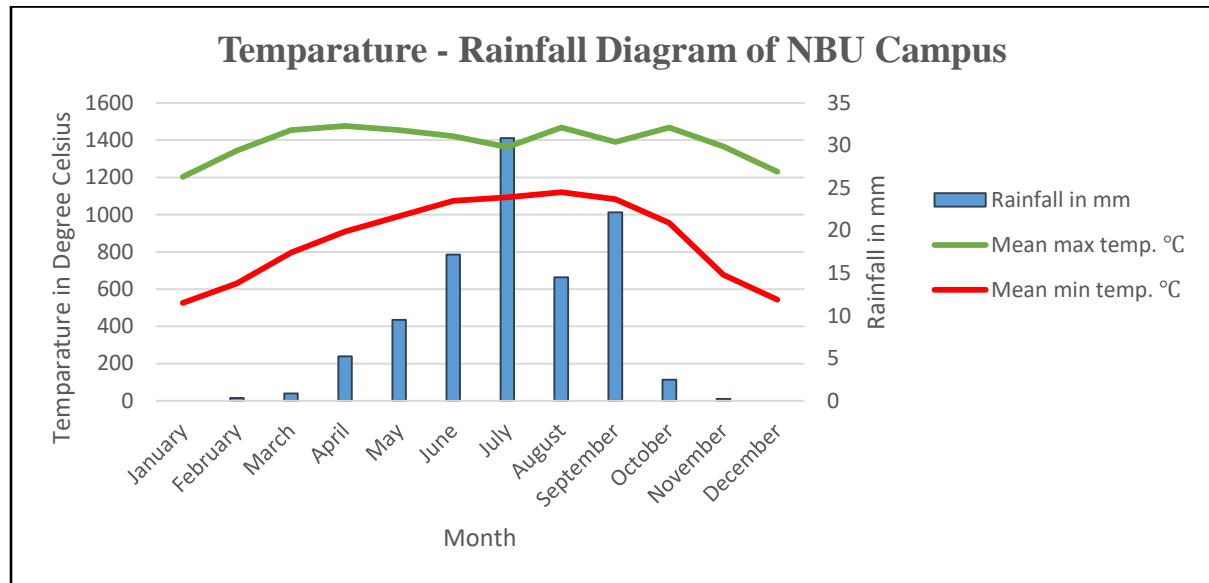
Winter starts from mid-November and continue till mid-March with mid-December to mid-January being the coldest period. This is followed by a rather short-lived spring from mid-March to May. Rainy season the most prolonged season in NBU Campus starts from June and continues till early October and July in the rainiest month. Early October to mid-November is autumn, the shortest season noticed in NBU Campus area.

Seasons	*Mean Temperature in °C			Seasonal Rainfall	
	Maximum	Minimum	Mean	In Millimetre	In Percent
<b>Winter</b>	28.3	13.2	20.8	55	1.16
<b>Spring</b>	31.9	20.1	26.0	677	14.33
<b>Rainy</b>	30.9	23.8	27.4	3965	83.90
<b>Autumn</b>	31.4	18.2	24.8	29	0.61

\*Based on Weather data collected at the NBU Weather Service Station since March 2000.

**Seasonal Rainfall:**

Being situated not far from the Himalayan mountains and the powerful impact of the south western monsoon over the imposing natural barrier, the weather condition of the NBU Campus area displays the unique atmospheric condition for yielding heavy rainfall of 4726 mm per annum (as per NBUWSS record since the year 2000). Seasonal distribution of rainfall displays that 83.90% of the total annual rainfall occurs during the rainy season (Monsoon). This is followed by Spring which contributes 14.33% of the total, which is mostly contributed by local thunderstorms. Winter season contribute only 1.16% of the total annual rainfall which is mostly caused by Western disturbances.



Climate of the NBU Campus is dominated by two seasons i.e., winter and rainy. However, another two relatively short spanned seasons namely spring and autumn are also noticed.

#### Seasonal Temperature

Winter starts from mid-November and continue till mid-March with mid-December to mid-January being the coldest period. This is followed by a rather short-lived spring from mid-March to May. Rainy season the most prolonged season in NBU Campus starts from June and continues till early October and July is the rainiest month. Early October to mid-November is autumn, the shortest season noticed in NBU Campus area.

**Table No. 1: Average weather records (up to March 2021)**

Months	Mean Maximum Temp. (°C)	Mean Minimum temp. (°C)	Mean humidity (%)	Rainfall (in mm)
January	26.3	11.5	71	0
February	29.4	13.8	69.52	16
March	31.8	17.4	62.1	39
April	32.3	19.9	72.63	239
May	31.8	21.7	78.2	435
June	31.1	23.5	82.54	786
July	29.8	23.9	86.78	1411
August	32.1	24.5	84.39	664
September	30.4	23.7	82.16	1012
October	32.1	20.9	75.49	114
November	29.9	14.8	73.82	10
December	26.9	11.9	69.13	0
Mean	30.3	18.9		Total: 4726

\*Based on Weather data collected at the NBU Weather Service Station since March 2000.

**Table No. 2. Seasonal Temperature and Rainfall\***

Seasons	*Mean Temperature in °C			Seasonal Rainfall	
	Maximum	Minimum	Mean	In mm	In (%)
Winter	24.3	10.1	17.2	43.5	1.3
Spring	31.2	19.3	25.25	417.5	12.33
Rainy	32.3	25.3	28.8	2895.6	85.54
Autumn	29.9	19.4	24.65	28.5	0.84

\*Based on Weather data collected at the NBU Weather Service Station since March 2000

#### Seasonal Rainfall:

Being situated not far from the Himalayan mountains and the powerful impact of the south western monsoon over the imposing natural barrier, the weather condition of the NBU Campus area displays the unique atmospheric condition for yielding heavy rainfall of 3385.1 mm per

annum (as per NBUWSS record since the year 2000). Seasonal distribution of rainfall displays that 85.54% of the total annual rain total during the rainy season (Monsoon). This is followed by Spring which contributes 12.33% of the total, which mostly contributed by local thunderstorms. Winter season contribute only 1.3% of the total annual which is mostly caused by Western disturbances.

### **Land Use**

The existing land use/land cover of North Bengal University Campus is very interesting to note as it contains a complex mosaic of diverse kind of utilisation (Fig. 2). These include natural Forest, Tea Gardens, Rubber plantations, Wetlands, Recreational, Transports, Academic, Administrative and Residential sectors Table 3). The uniqueness of the campus is its vast greenery an emerald green landscape 37.43% dedicated green areas and another 52.26% area of partial greenery makes the NBU campus as an ideal Green Campus. In fact, the “Salkunja”, the natural Sal forest, aquatic and semi-aquatic Magurmari valley along with its great flora and faunal diversity tempted to have the unique bio-diversity reserve within the NBU campus which might be treated as the backbone of the futuristic land use management plan.

**Table 3: Land use/Land cover pattern of NBU campus**

<i>Sl No</i>	<i>Land Use Category</i>	<i>Area in hectare</i>	<i>Area in Acre</i>	<i>Area in Percent</i>
1	Covered area (Buildings)	6.0913	15.052	4.57
2	Road Network	5.0781	12.548	3.8
3	Wetlands	2.5933	6.408	1.94
4	Playground	3.1179	7.704	2.34
5	Parks & Gardens	9.6234	23.779	7.22
6	Tea Garden	21.5384	53.221	16.15
7	Rubber Plantation	10.984	27.142	8.24
8	Plantation Forest	17.3962	42.986	13.04
9	Open Space (Vacant & Marginal Land)	56.9584	140.744	42.70
	<b>Total</b>	<b>133.381</b>	<b>329.584</b>	<b>100</b>

### **WATER & SOIL**

The soil analysis from different spots shows expected values and tap water is also within normal range.



Soil testing Report (Received from Soil testing laboratory, NBU)

Region	pH	Organic carbon (%)	Nitrogen (%)	Potassium (K <sub>2</sub> O) ppm.	Phosphrus (P <sub>2</sub> O <sub>5</sub> )ppm
Tea Plantation	5.0	2.026	0.25	25.2	9.8
Rubber Plantation	5.15	1.916	0.17	18.3	3.2
Mixed Forest	5.04	2.118	0.24	23.6	4.7
<i>Shorea</i> Plantation	5.7	3.646	0.39	27.9	3.9

Water Testing Report

Region	pH
Tap Water (Tea Science)	6.3

**Greenscape**

The term “Green” means eco-friendly or not damaging the environment. This can acronymically be called as “Global Readiness in Ensuring Ecological Neutrality” (GREEN). Green accounting can be defined as systematic identification, quantification, recording, reporting and analysis of components of ecological diversity and expressing the same in financial or social terms. “Green Auditing”, an umbrella term, is known by another name “Environmental Auditing”. There is a provision of green audit in University campus. Estate Dept. has been formed to monitor the proper conservation and plantation of the plants in the campus. As per the suggestions made by IQAC and various committee. Estate Department has been given the responsibility to do green with cooperation of the environmental experts of the University and locality.

The University was established in 1962 and reaccredited with Grade ‘B ++’ by NAAC, Bangalore, in the year 2022. Total area of the University main campus is 335.013 acres of which 34 percent is covered by herbs, shrubs and trees, including valuable medicinal plants. The plant has been systematically identified by the Divisional Forest Officer, Social Forestry and classified by the system of Benthem and Hooker. There are more than 538 plant species. Ecological importance of plants is studied; diseases of plants are also studied. Tree census of campus was

carried out, Birds, insects, fungi and overall the biodiversity of the campus is studied. Along with topographic study of the campus measurement of the campus is also taken. Green spot of the of the campus identified. Tree plantation and environmental awareness programmes of the university also remarkable which is mentioned by the NAAC Peer team in their last visit in the year 2016. To increase greenery in campus. Extra efforts have been taken by the University to create environment consciousness amongst students / Scholars and Campus dwellers. Our Jalpaiguri Campus (2nd Campus) at Jalpaiguri 50 K.M. distance from here. Total area is 31.50 acres. Development and other works are going on. 40.54 acres of land given on lease to M/S Greenol Laboratories Pvt. Ltd for Tea Plantation and 17.00 acres of land in Eastern Sector and 5.5 acres of land in Western Sector are being used for Rubber Plantation.

### **List of Trees in the University Campus**

**According to Tree Card issued by the Divisional Forest Officer (D.F.O.), Social Forestry**

Sl. No.	Name of the Tree	Qty
<b>1.</b>	Sal	841 nos.
<b>2.</b>	Sishu	1320 nos.
<b>3.</b>	Gamar	140 nos.
<b>4.</b>	Chap	35 nos.
<b>5.</b>	Segun	125 nos.
<b>6.</b>	Meheguni	30 nos.
<b>7.</b>	Kukath	4272 nos.
<b>8</b>	Kadam	73 nos.
<b>9</b>	Ghora neem	23 nos.
<b>Total No. of Tree</b>		<b>6859 nos.</b>

## **BIODIVERSITY OF THE CAMPUS**

The lush green campus of NBU is very in biodiversity and housing mostly sub-Himalayan flora and faunal species. The existing Forested, grassland and aquatic ecosystems diversity boost the specific diversity along with genetic diversity by allowing balanced ecosystem within the campus. The species richness in various plantation areas shows high species diversity whereas other natural patches showing significant diversity. The campus is rich with various plants groups including flowerings plants, Gymnosperms, ferns, mosses and different fungal species.

### **Tree diversity**

The campus harbor more than 700 plant species, including major plant life forms, viz., tree, shrubs, herbs, climbers, and epiphytes. These are not only contributing to aesthetic beauty, but also help reducing carbon emission. The largest canopy is provided by the tree diversity; and it includes more than 142 tree species (Table 1). Individual counts of each tree species under process. Many individual of various tree species were tagged with properly identified name plates to aware the campus dwellers. The Work has been done by NSS with expert guidance of Department of Botany, NBU.

**Table 1: Checklist of trees of the campus**

<b>Taxon</b>	<b>Family</b>	<b>Individual count</b>
<i>Acacia catechu</i> (L.f.) Willd.	Fabaceae	NA
<i>Adenanthera pavonina</i> L.	Fabaceae	NA
<i>Aegle marmelos</i> (L.) Corrêa	Rutaceae	NA
<i>Alangium chinense</i> (Lour.) Harms	Cornaceae	NA
<i>Albizia lebbek</i> (L.) Benth.	Fabaceae	NA
<i>Albizia chinensis</i> (Osbeck) Merr.	Fabaceae	NA
<i>Alstonia macrophylla</i> Wall. ex G.Don	Apocynaceae	NA
<i>Alstonia scholaris</i> (L.) R. Br.	Apocynaceae	NA
<i>Alstonia neriifolia</i> D.Don	Apocynaceae	NA
<i>Anacardium occidentale</i> L.	Anacardiaceae	NA
<i>Annona reticulata</i> L.	Annonaceae	NA
<i>Annona squamosa</i> L.	Annonaceae	NA
<i>Aquilaria malaccensis</i> Lam.	Thymelaeaceae	NA

<i>Areca triandra</i> Roxb. ex Buch.-Ham.	Arecaceae	NA
<i>Areca catechu</i> L.	Arecaceae	NA
<i>Artocarpus chama</i> Buch.-Ham.	Moraceae	NA
<i>Artocarpus lacucha</i> Buch.-Ham.	Moraceae	NA
<i>Averrhoa carambola</i> L.	Oxalidaceae	NA
<i>Azadirachta indica</i> A.Juss.	Meliaceae	NA
<i>Baccaurea ramiflora</i> Lour.	Phyllanthaceae	NA
<i>Bauhinia acuminata</i> L.	Fabaceae	NA
<i>Bauhinia purpurea</i> L.	Fabaceae	NA
<i>Bauhinia scandens</i> L.	Fabaceae	NA
<i>Berchemia floribunda</i> (Wall.) Brongn.	Rhamnaceae	NA
<i>Bischofia javanica</i> Blume	Phyllanthaceae	NA
<i>Bixa orellana</i> L.	Bixaceae	NA
<i>Bombax ceiba</i> L.	Malvaceae	NA
<i>Bridelia retusa</i> (L.) A.Juss.	Phyllanthaceae	NA
<i>Butea buteiformis</i> (Voigt) Mabb.	Fabaceae	NA
<i>Butea monosperma</i> (Lam.) Taub.	Fabaceae	NA
<i>Careya arborea</i> Roxb.	Lecythidaceae	NA
<i>Carica papaya</i> L.	Caricaceae	NA
<i>Caryota urens</i> L.	Arecaceae	NA
<i>Cascabela thevetia</i> (L.) Lippold	Apocynaceae	NA
<i>Cassia fistula</i> L.	Fabaceae	NA
<i>Ceiba pentandra</i> (L.) Gaertn.	Malvaceae	NA
<i>Cinnamomum bejolghota</i> (Buch.-Ham.) Sweet	Lauraceae	NA
<i>Cinnamomum camphora</i> (L.) J.Presl	Lauraceae	NA
<i>Cinnamomum glaucescens</i> (Nees) Hand.-Mazz.	Lauraceae	NA
<i>Cinnamomum tamala</i> (Buch.-Ham.) T.Nees & Eberm.	Lauraceae	NA

<i>Cinnamomum verum</i> J.Presl	Lauraceae	NA
<i>Coccoloba diversifolia</i> Jacq.	Polygonaceae	NA
<i>Cornus capitata</i> Wall.	Cornaceae	NA
<i>Corypha</i> sp.	Arecaceae	NA
<i>Crateva religiosa</i> G.Forst.	Capparaceae	NA
<i>Crescentia cujete</i> L.	Bignoniaceae	NA
<i>Dalbergia sissoo</i> DC.	Fabaceae	1320
<i>Dalbergia latifolia</i> Roxb.	Fabaceae	NA
<i>Dillenia indica</i> L.	Dilleniaceae	NA
<i>Diospyros malabarica</i> (Desr.) Kostel.	Ebenaceae	NA
<i>Dipterocarpus retusus</i> Blume	Dipterocarpaceae	NA
<i>Dipterocarpus turbinatus</i> C.F.Gaertn	Dipterocarpaceae	NA
<i>Duabanga grandiflora</i> (DC.) Walp.	Lythraceae	NA
<i>Dysoxylum excelsum</i> Blume	Meliaceae	NA
<i>Elaeis guineensis</i> Jacq.	Arecaceae	NA
<i>Elaeocarpus floribundus</i> Blume	Elaeocarpaceae	NA
<i>Elaeocarpus serratus</i> L.	Elaeocarpaceae	NA
<i>Erythrina variegata</i> L.	Fabaceae	NA
<i>Ficus benghalensis</i> L.	Moraceae	NA
<i>Ficus benamina</i> L.	Moraceae	NA
<i>Ficus hirta</i> Vahl	Moraceae	NA
<i>Ficus hispida</i> L.f.	Moraceae	NA
<i>Ficus racemosa</i> L.	Moraceae	NA
<i>Ficus religiosa</i> L.	Moraceae	NA
<i>Ficus semicordata</i> Buch.-Ham. ex Sm.	Moraceae	NA
<i>Firmiana colorata</i> (Roxb.) R.Br.	Malvaceae	NA
<i>Flacourtia jangomas</i> (Lour.) Raeusch.	Salicaceae	NA
<i>Gmelina arborea</i> Roxb.	Lamiaceae	140

<i>Gynocardia odorata</i> R.Br.	Achariaceae	NA
<i>Holarrhena pubescens</i> Wall. ex G.Don	Apocynaceae	NA
<i>Ilex godajam</i> Colebr. ex Hook.f.	Aquifoliaceae	NA
<i>Knema erratica</i> (Hook. f. & Thomson) J. Sinclair	Myristicaceae	NA
<i>Lagerstroemia speciosa</i> (L.) Pers.	Lythraceae	NA
<i>Lannea coromandelica</i> (Houtt.) Merr.	Anacardiaceae	NA
<i>Litchi chinensis</i> Sonn.	Sapindaceae	NA
<i>Litsea glutinosa</i> (Lour.) C.B.Rob.	Lauraceae	NA
<i>Litsea monopetala</i> (Roxb.) Pers.	Lauraceae	NA
<i>Magnolia grandiflora</i> L.	Magnoliaceae	NA
<i>Magnolia champaca</i> (L.) Baill. ex Pierre	Magnoliaceae	35
<i>Mangifera indica</i> L.	Anacardiaceae	NA
<i>Manihot esculenta</i> Crantz	Euphorbiaceae	NA
<i>Manilkara zapota</i> (L.) P.Royen	Sapotaceae	NA
<i>Melia azedarach</i> L.	Meliaceae	23
<i>Mesua ferrea</i> L.	Calophyllaceae	NA
<i>Mimusops elengi</i> L.	Sapotaceae	NA
<i>Morinda angustifolia</i> Roxb.	Rubiaceae	NA
<i>Moringa oleifera</i> Lam.	Moringaceae	NA
<i>Morus alba</i> L.	Moraceae	NA
<i>Myristica fragrans</i> Houtt.	Myristicaceae	NA
<i>Neolamarckia cadamba</i> (Roxb.) Bosser	Rubiaceae	NA
<i>Nyctanthes arbor-tristis</i> L.	Oleaceae	NA
<i>Nypa fruticans</i> Wurmbr.	Arecaceae	NA
<i>Oroxylum indicum</i> (L.) Kurz	Bignoniaceae	NA
<i>Persea glaucescens</i> (Nees) D.G. Long	Lauraceae	NA
<i>Phoebe attenuata</i> (Nees) Nees	Lauraceae	NA
<i>Phyllanthus acidus</i> (L.) Skeels	Phyllanthaceae	NA

<i>Phyllanthus emblica</i> L.	Phyllanthaceae	NA
<i>Pimenta dioica</i> (L.) Merr.	Myrtaceae	NA
<i>Podocarpus rumphii</i> Blume	Podocarpaceae	NA
<i>Podocarpus neriifolius</i> D.Don	Podocarpaceae	NA
<i>Pongamia pinnata</i> (L.) Pierre	Fabaceae	NA
<i>Premna mollissima</i> Roth.	Lamiaceae	NA
<i>Psidium guajava</i> L.	Myrtaceae	NA
<i>Punica granatum</i> L.	Lythraceae	NA
<i>Putranjiva roxburghii</i> Wall.	Putranjivaceae	NA
<i>Pyrus pyraster</i> (L.) Burgsd.	Rosaceae	NA
<i>Santalum album</i> L.	Santalaceae	NA
<i>Sapindus rarak</i> DC.	Salicaceae	NA
<i>Saraca asoca</i> (Roxb.) Willd.	Fabaceae	NA
<i>Saraca indica</i> L.	Fabaceae	NA
<i>Schima wallichii</i> Choisy	Theaceae	NA
<i>Sesbania grandiflora</i> (L.) Pers.	Fabaceae	NA
<i>Shorea robusta</i> Gaertn.	Dipterocarpaceae	841
<i>Simarouba amara</i> Aubl.	Simaroubaceae	NA
<i>Spathodea campanulata</i> P.Beauv.	Bignoniaceae	NA
<i>Spondias pinnata</i> (L. f.) Kurz	Anacardiaceae	NA
<i>Streblus asper</i> Lour.	Moraceae	NA
<i>Strychnos nux-vomica</i> L.	Loganiaceae	NA
<i>Syzygium jambos</i> (L.) Alston	Myrtaceae	NA
<i>Syzygium cumini</i> (L.) Skeels	Myrtaceae	NA
<i>Syzygium kurzii</i> (Duthie) N.P.Balacr.	Myrtaceae	NA
<i>Tamarindus indica</i> L.	Fabaceae	NA
<i>Tectona grandis</i> L.f.	Lamiaceae	NA
<i>Terminalia arjuna</i> (Roxb. ex DC.) Wight & Arn.	Combretaceae	NA

<i>Terminalia bellirica</i> (Gaertn.) Roxb.	Combretaceae	NA
<i>Terminalia chebula</i> Retz.	Combretaceae	NA
<i>Terminalia myriocarpa</i> Van Heurck & Müll. Arg.	Combretaceae	NA
<i>Theobroma cacao</i> L.	Malvaceae	NA
<i>Toona ciliata</i> M.Roem.	Meliaceae	NA
<i>Trema orientalis</i> (L.) Blume	Cannabaceae	NA
<i>Trevesia palmata</i> (Roxb. ex Lindl.) Vis.	Araliaceae	NA
<i>Wrightia arborea</i> (Dennst.) Mabb.	Apocynaceae	NA
<i>Zanthoxylum budrunga</i> DC.	Rutaceae	NA
<i>Ziziphus jujuba</i> Mill.	Rhamnaceae	NA
<i>Ziziphus oenoplia</i> (L.) Mill.	Rhamnaceae	NA

### Shrubs, Climbers and Herbaceous species diversity:

More than 92 species of shrubs are also reported from the campus. This includes *ex-situ* conservation of *Rouvolfia serpentina* (Rubiaceae), *Withania somnifera* (Solanaceae), etc. A large number of herbs are also recorded from the campus. More than 315 species of herbs include a large number of grasses and sedges, members of Polygonaceae, Linderniaceae, Solanaceae, Rubiaceae, and Lamaceae.

Table 2: Checklist of shrub flora of the campus

<b>Taxon</b>	<b>Family</b>	<b>Habit</b>
<i>Abroma augusta</i> (L.) L.f.	Malvaceae	Shrub
<i>Ardisia solanacea</i> (Poir.) Roxb.	Primulaceae	Shrub
<i>Boehmeria hamiltoniana</i> Wedd.	Urticaceae	Shrub
<i>Breynia vitis-idaea</i> (Burm.f.) C.E.C.Fisch.	Phyllanthaceae	Shrub
<i>Brugmansia suaveolens</i> (Humb. & Bonpl.ex Willd.) Bercht. & J.Presl.	Solanaceae	Shrub
<i>Buddleja asiatica</i> Lour.	Scrophulariaceae	Shrub
<i>Caesalpinia bonduc</i> (L.) Roxb.	Fabaceae	Shrub
<i>Caesalpinia pulcherrima</i> (L.) Sw.	Fabaceae	Shrub
<i>Cajanus scarabaeoides</i> (L.) Thouars	Fabaceae	Shrub
<i>Cajanus cajan</i> (L.) Millsp.	Fabaceae	Shrub
<i>Calotropis gigantea</i> (L.) Dryand.	Apocynaceae	Shrub
<i>Calotropis procera</i> (Aiton) Dryand.	Apocynaceae	Shrub
<i>Camellia japonica</i> L.	Theaceae	Shrub



<i>Camellia sinensis</i> (L.) Kuntze	Theaceae	Shrub
<i>Carapichea ipecacuanha</i> (Brot.) L.Andersson	Rubiaceae	Shrub
<i>Cereus repandus</i> (L.) Mill.	Cactaceae	Shrub
<i>Chloranthus elatior</i> Link	Chloranthaceae	Shrub
<i>Chromolaena odorata</i> (L.) R.M.King & H.Rob.	Asteraceae	Shrub
<i>Cinchona pubescens</i> Vahl	Rubiaceae	Shrub
<i>Citrus limon</i> (L.) Osbeck	Rutaceae	Shrub
<i>Citrus maxima</i> (Burm.) Merr.	Rutaceae	Shrub
<i>Citrus medica</i> L.	Rutaceae	Shrub
<i>Clerodendrum chinense</i> (Osbeck) Mabb.	Lamiaceae	Shrub
<i>Clerodendrum indicum</i> (L.) Kuntze	Lamiaceae	Shrub
<i>Clerodendrum infortunatum</i> L.	Lamiaceae	Shrub
<i>Clerodendrum japonicum</i> (Thunb.) Sweet	Lamiaceae	Shrub
<i>Coffea arabica</i> L.	Rubiaceae	Shrub
<i>Coffea benghalensis</i> B.Heyne ex Schult.	Rubiaceae	Shrub
<i>Commiphora mukul</i> (Hook. ex Stocks) Engl.	Burseraceae	Shrub
<i>Crotalaria retusa</i> L.	Fabaceae	Shrub
<i>Croton tiglium</i> L.	Euphorbiaceae	Shrub
<i>Datura metel</i> L.	Solanaceae	Shrub
<i>Datura innoxia</i> Mill.	Solanaceae	Shrub
<i>Datura stramonium</i> L.	Solanaceae	Shrub
<i>Elaeagnus conferta</i> Roxb.	Elaeagnaceae	Shrub
<i>Euphorbia neriifolia</i> L.	Euphorbiaceae	Shrub
<i>Euphorbia pulcherrima</i> Willd. ex Klotzsch	Euphorbiaceae	Shrub
<i>Euphorbia royleana</i> Boiss.	Euphorbiaceae	Shrub
<i>Euphorbia tirucalli</i> L.	Euphorbiaceae	Shrub
<i>Euphorbia tithymaloides</i> L.	Euphorbiaceae	Shrub
<i>Flacourtia indica</i> (Burm.f.) Merr.	Salicaceae	Shrub
<i>Flemingia strobilifera</i> (L.) W.T.Aiton	Fabaceae	Shrub
<i>Flueggea virosa</i> (Roxb. ex Willd.) Royle	Phyllanthaceae	Shrub
<i>Gardenia jasminoides</i> J.Ellis	Rubiaceae	Shrub
<i>Glycosmis pentaphylla</i> (Retz.) DC.	Rutaceae	Shrub
<i>Gossypium arboreum</i> L.	Malvaceae	Shrub
<i>Hibiscus fragrans</i> Roxburgh	Malvaceae	Shrub
<i>Hibiscus mutabilis</i> L.	Malvaceae	Shrub
<i>Hibiscus rosa-sinensis</i> L.	Malvaceae	Shrub
<i>Hibiscus schizopetalus</i> (Dyer) Hook.f.	Malvaceae	Shrub
<i>Ichnocarpus frutescens</i> (L.) W.T.Aiton	Apocynaceae	Shrub
<i>Indigofera tinctoria</i> L.	Fabaceae	Shrub
<i>Jasminum lanceolaria</i> Roxb.	Oleaceae	Shrub
<i>Jasminum sambac</i> (L.) Aiton	Oleaceae	Shrub

<i>Jatropha curcas</i> L.	Euphorbiaceae	Shrub
<i>Jatropha gossypifolia</i> L.	Euphorbiaceae	Shrub
<i>Justicia adhatoda</i> L.	Acanthaceae	Shrub
<i>Kopsia fruticosa</i> (Roxb.) A.DC.	Apocynaceae	Shrub
<i>Lantana × aculeata</i> L.	Verbenaceae	Shrub
<i>Lawsonia inermis</i> L.	Lythraceae	Shrub
<i>Maesa indica</i> (Roxb.) A. DC.	Primulaceae	Shrub
<i>Melastoma malabathricum</i> L.	Melastomataceae	Shrub
<i>Murraya koenigii</i> (L.) Spreng.	Rutaceae	Shrub
<i>Murraya paniculata</i> (L.) Jack	Rutaceae	Shrub
<i>Musa × paradisiaca</i> L.	Musaceae	Shrub
<i>Mussaenda roxburghii</i> Hook.f.	Rubiaceae	Shrub
<i>Nandina domestica</i> Thunb.	Berberidaceae	Shrub
<i>Opuntia ficus-indica</i> (L.) Mill.	Cactaceae	Shrub
<i>Osbeckia nepalensis</i> Hook. f.	Melastomataceae	Shrub
<i>Pandanus amaryllifolius</i> Roxb.	Pandanaceae	Shrub
<i>Pandanus tectorius</i> Parkinson ex Du Roi	Pandanaceae	Shrub
<i>Pandanus unguifer</i> Hook.f.	Pandanaceae	Shrub
<i>Pereskia aculeata</i> Mill.	Cactaceae	Shrub
<i>Petrea volubilis</i> L.	Verbenaceae	Shrub
<i>Rauvolfia tetraphylla</i> L.	Apocynaceae	Shrub
<i>Rauvolfia serpentina</i> (L.) Benth. ex Kurz	Apocynaceae	Shrub
<i>Ricinus communis</i> L.	Euphorbiaceae	Shrub
<i>Rothea serrata</i> (L.) Steane & Mabb.	Lamiaceae	Shrub
<i>Rubus buergeri</i> Miq.	Rosaceae	Shrub
<i>Rubus calycinus</i> Wall. ex D.Don	Rosaceae	Shrub
<i>Rubus ellipticus</i> Sm.	Rosaceae	Shrub
<i>Rubus lineatus</i> Reinw. ex Blume	Rosaceae	Shrub
<i>Rubus paniculatus</i> Sm.	Rosaceae	Shrub
<i>Rubus treutleri</i> Hook.f.	Rosaceae	Shrub
<i>Rubus wardii</i> Merr.	Rosaceae	Shrub
<i>Senna alata</i> (L.) Roxb.	Fabaceae	Shrub
<i>Sesbania sesban</i> (L.) Merr.	Fabaceae	Shrub
<i>Tabernaemontana divaricata</i> (L.) R.Br. ex Roem. & Schult.	Apocynaceae	Shrub
<i>Tephrosia candida</i> (Roxb.) DC.	Fabaceae	Shrub
<i>Uncaria macrophylla</i> Wall.	Rubiaceae	Shrub
<i>Vitex negundo</i> L.	Lamiaceae	Shrub
<i>Withania somnifera</i> (L.) Dunal	Solanaceae	Shrub

**Table 3: Checklist of herbaceous flora of the campus**

<b>Taxon</b>	<b>Family</b>	<b>Habit</b>
<i>Abelmoschus moschatus</i> Medik.	Malvaceae	Herb
<i>Abrus precatorius</i> L.	Fabaceae	Herb
<i>Abutilon indicum</i> (L.) Sweet	Malvaceae	Herb
<i>Acalypha indica</i> L.	Euphorbiaceae	Herb
<i>Acanthus caudatus</i> Lindau	Acanthaceae	Herb
<i>Acanthus leucostachyus</i> Wall. ex Nees	Acanthaceae	Herb
<i>Achyranthes aspera</i> L.	Amaranthaceae	Herb
<i>Achyranthes bidentata</i> Blume	Amaranthaceae	Herb
<i>Acmella calva</i> (DC.) R.K.Jansen	Asteraceae	Herb
<i>Acmella uliginosa</i> (Sw.) Cass.	Asteraceae	Herb
<i>Acorus calamus</i> L.	Acoraceae	Herb
<i>Aerva lanata</i> (L.) Juss.	Amaranthaceae	Herb
<i>Aerva sanguinolenta</i> (L.) Blume	Amaranthaceae	Herb
<i>Agave americana</i> L.	Asparagaceae	Herb
<i>Ageratina adenophora</i> (Spreng.) R.M.King & H.Rob.	Asteraceae	Herb
<i>Ageratum conyzoides</i> (L.) L.	Asteraceae	Herb
<i>Ageratum houstonianum</i> Mill.	Asteraceae	Herb
<i>Allium cepa</i> L.	Amaryllidaceae	Herb
<i>Allium hookeri</i> Thwaites	Amaryllidaceae	Herb
<i>Allium hypsistum</i> Stearn	Amaryllidaceae	Herb
<i>Allium sativum</i> L.	Amaryllidaceae	Herb
<i>Allium stracheyi</i> Baker	Amaryllidaceae	Herb
<i>Alocasia fallax</i> Schott	Araceae	Herb
<i>Alocasia macrorrhizos</i> (L.) G.Don	Araceae	Herb
<i>Aloe jucunda</i> Reynolds	Xanthorrhoeaceae	Herb
<i>Aloe vera</i> (L.) Burm.f.	Xanthorrhoeaceae	Herb
<i>Alpinia galanga</i> (L.) Willd.	Zingiberaceae	Herb
<i>Alpinia malaccensis</i> (Burm.f.) Roscoe	Zingiberaceae	Herb
<i>Alpinia nigra</i> (Gaertn.) Burtt	Zingiberaceae	Herb
<i>Alpinia zerumbet</i> (Pers.) B.L.Burtt & R.M.Sm.	Zingiberaceae	Herb
<i>Alternanthera philoxeroides</i> (Mart.) Griseb.	Amaranthaceae	Herb
<i>Alternanthera paronychioides</i> A.St.-Hil.	Amaranthaceae	Herb
<i>Alternanthera sessilis</i> (L.) R.Br. ex DC.	Amaranthaceae	Herb
<i>Amaranthus blitum</i> subsp. <i>oleraceus</i> (L.) Costea.	Amaranthaceae	Herb
<i>Amaranthus spinosus</i> L.	Amaranthaceae	Herb
<i>Amaranthus viridis</i> L.	Amaranthaceae	Herb
<i>Amischotolype hookeri</i> (Hassk.) H.Hara	Commelinaceae	Herb
<i>Amomum dealbatum</i> Roxb.	Zingiberaceae	Herb
<i>Amomum subulatum</i> Roxb.	Zingiberaceae	Herb

<i>Amorphophallus bulbifer</i> (Roxb.) Blume	Araceae	Herb
<i>Amorphophallus napalensis</i> (Wall.) Bogner & Mayo	Araceae	Herb
<i>Ananas comosus</i> (L.) Merr.	Bromeliaceae	Herb
<i>Andrographis paniculata</i> (Burm.f.) Nees	Acanthaceae	Herb
<i>Anisomeles indica</i> (L.) Kuntze	Lamiaceae	Herb
<i>Argemone mexicana</i> L.	Papaveraceae	Herb
<i>Artemisia annua</i> L.	Asteraceae	Herb
<i>Artemisia indica</i> Willd.	Asteraceae	Herb
<i>Artemisia vulgaris</i> L.	Asteraceae	Herb
<i>Astilbe rivularis</i> Buch.-Ham. ex D.Don	Saxifragaceae	Herb
<i>Axonopus compressus</i> (Sw.) P.Beauv.	Poaceae	Herb
<i>Ayapana triplinervis</i> (Vahl) R.M.King & H.Rob.	Asteraceae	Herb
<i>Bacopa monnieri</i> (L.) Wettst.	Plantaginaceae	Herb
<i>Barleria cristata</i> L.	Acanthaceae	Herb
<i>Barleria lupulina</i> Lindl.	Acanthaceae	Herb
<i>Barleria strigosa</i> Willd.	Acanthaceae	Herb
<i>Bergenia ciliata</i> (Haw.) Sternb.	Saxifragaceae	Herb
<i>Bidens pilosa</i> L.	Asteraceae	Herb
<i>Biophytum reinwardtii</i> (Zucc.) Klotzsch	Oxalidaceae	Herb
<i>Blumea hieracifolia</i> Hayata	Asteraceae	Herb
<i>Blumea lacera</i> (Burm.f.) DC.	Asteraceae	Herb
<i>Boerhavia diffusa</i> L.	Nyctaginaceae	Herb
<i>Brassica juncea</i> (L.) Czern.	Brassicaceae	Herb
<i>Brassica rapa</i> L.	Brassicaceae	Herb
<i>Bryophyllum pinnatum</i> (Lam.) Oken	Crassulaceae	Herb
<i>Bulbostylis barbata</i> (Rottb.) C.B.Clarke	Cyperaceae	Herb
<i>Caladium bicolor</i> (Aiton) Vent.	Araceae	Herb
<i>Canna indica</i> L.	Cannaceae	Herb
<i>Cannabis sativa</i> L.	Cannabaceae	Herb
<i>Catharanthus roseus</i> (L.) G.Don	Apocynaceae	Herb
<i>Celosia argentea</i> L.	Amaranthaceae	Herb
<i>Centella asiatica</i> (L.) Urb.	Apiaceae	Herb
<i>Chamaecrista mimosoides</i> (L.) Greene	Fabaceae	Herb
<i>Cheilocostus speciosus</i> (J.Koenig) C.D.Specht	Costaceae	Herb
<i>Chenopodium album</i> L.	Amaranthaceae	Herb
<i>Chenopodium giganteum</i> D.Don	Amaranthaceae	Herb
<i>Chlorophytum arundinaceum</i> Baker	Asparagaceae	Herb
<i>Chrysopogon aciculatus</i> (Retz.) Trin.	Poaceae	Herb
<i>Chrysopogon zizanioides</i> (L.) Roberty	Poaceae	Herb
<i>Cleome rutidosperma</i> DC.	Cleomaceae	Herb
<i>Cleome viscosa</i> L.	Cleomaceae	Herb

Codariocalyx motorius (Houtt.) H.Ohashi	Fabaceae	Herb
Coix lacryma-jobi L.	Poaceae	Herb
Coleus forskohlii (Willd.) Briq.	Lamiaceae	Herb
Colocasia affinis Schott	Araceae	Herb
Colocasia esculenta (L.) Schott	Araceae	Herb
Colocasia fallax Schott	Araceae	Herb
Commelina benghalensis L.	Commelinaceae	Herb
Commelina longifolia Lam.	Commelinaceae	Herb
Commelina suffruticosa Blume	Commelinaceae	Herb
Coriandrum sativum L.	Apiaceae	Herb
Costus erythrophyllus Loes.	Costaceae	Herb
Costus malortieanus H.Wendl.	Costaceae	Herb
Crinum amoenum Ker Gawl. ex Roxb.	Amryllidaceae	Herb
Crinum asiaticum L.	Amryllidaceae	Herb
Crotalaria alata D.Don	Fabaceae	Herb
Crotalaria cytisoides DC.	Fabaceae	Herb
Crotalaria pallida Aiton	Fabaceae	Herb
Croton bonplandianus Baill.	Euphorbiaceae	Herb
Cuphea micropetala Kunth	Lythraceae	Herb
Cuphea viscosissima Jacq.	Lythraceae	Herb
Curculigo orchioides Gaertn.	Hypoxidaceae	Herb
Curcuma amada Roxb.	Zingiberaceae	Herb
Curcuma aromatica Salisb.	Zingiberaceae	Herb
Curcuma caesia Roxb.	Zingiberaceae	Herb
Curcuma longa L.	Zingiberaceae	Herb
Curcuma zedoaria (Christm.) Roscoe	Zingiberaceae	Herb
Cyanthillium cinereum (L.) H.Rob.	Asteraceae	Herb
Cymbopogon citratus (DC.) Stapf	Poaceae	Herb
Cymbopogon pendulus (Nees ex Steud.) W.Watson	Poaceae	Herb
Cynodon dactylon (L.) Pers.	Poaceae	Herb
Cynoglossum lanceolatum Forssk.	Boraginaceae	Herb
Cyperus compressus L.	Cyperaceae	Herb
Cyperus cyperoides (L.) Kuntze	Cyperaceae	Herb
Cyperus distans L.f.	Cyperaceae	Herb
Cyperus haspan L.	Cyperaceae	Herb
Cyperus iria L.	Cyperaceae	Herb
Cyperus rotundus L.	Cyperaceae	Herb
Cyrtococcum patens (L.) A.Camus	Poaceae	Herb
Dactyloctenium aegyptium (L.) Willd.	Poaceae	Herb
Daucus carota L.	Apiaceae	Herb
Deeringia amaranthoides (Lam.) Merr.	Amaranthaceae	Herb

<i>Desmodium gangeticum</i> (L.) DC.	Fabaceae	Herb
<i>Desmodium triflorum</i> (L.) DC.	Fabaceae	Herb
<i>Dicliptera bupleuroides</i> Nees	Acanthaceae	Herb
<i>Digitaria ciliaris</i> (Retz.) Koeler	Poaceae	Herb
<i>Digitaria sanguinalis</i> (L.) Scop.	Poaceae	Herb
<i>Docynia indica</i> (Wall.) Decne.	Rosaceae	Herb
<i>Drosera burmanni</i> Vahl	Droseraceae	Herb
<i>Drymaria cordata</i> (L.) Willd. ex Schult.	Caryophyllaceae	Herb
<i>Dysphania ambrosioides</i> (L.) Mosyakin & Clemants	Amaranthaceae	Herb
<i>Eclipta prostrata</i> (L.) L.	Asteraceae	Herb
<i>Eichhornia crassipes</i> (Mart.) Solms	Pontederiaceae	Herb
<i>Eleocharis dulcis</i> (Burm.f.) Trin. ex Hensch.	Cyperaceae	Herb
<i>Elephantopus scaber</i> L.	Asteraceae	Herb
<i>Elettaria</i> sp.	Zingiberaceae	Herb
<i>Eleusine indica</i> (L.) Gaertn.	Poaceae	Herb
<i>Eleutherine bulbosa</i> (Mill.) Urb.	Iridaceae	Herb
<i>Emilia sonchifolia</i> (L.) DC. ex DC.	Asteraceae	Herb
<i>Enydra fluctuans</i> DC.	Asteraceae	Herb
<i>Eragrostis amabilis</i> (L.) Wight & Arn.	Poaceae	Herb
<i>Eragrostis gangetica</i> (Roxb.) Steud.	Poaceae	Herb
<i>Eragrostis unioloides</i> (Retz.) Nees ex Steud.	Poaceae	Herb
<i>Eranthemum griffithii</i> (T.Anderson)	Acanthaceae	Herb
<i>Eryngium foetidum</i> L.	Apiaceae	Herb
<i>Euphorbia hirta</i> L.	Euphorbiaceae	Herb
<i>Euryale ferox</i> Salisb.	Nymphaeaceae	Herb
<i>Euryale ferox</i> Salisb.	Nymphaeaceae	Herb
<i>Fimbristylis aestivalis</i> Vahl	Cyperaceae	Herb
<i>Fimbristylis bisumbellata</i> (Forssk.) Bubani	Cyperaceae	Herb
<i>Floscopa scandens</i> Lour.	Commelinaceae	Herb
<i>Foeniculum vulgare</i> Mill.	Apiaceae	Herb
<i>Fragaria ananassa</i> (Weston) Duchesne	Rosaceae	Herb
<i>Fumaria indica</i> (Hausskn.) Pugsley	Papaveraceae	Herb
<i>Girardinia diversifolia</i> (Link) Friis	Urticaceae	Herb
<i>Glinus oppositifolius</i> (L.) Aug.DC.	Molluginaceae	Herb
<i>Globba andersonii</i> C.B.Clarke ex Baker	Zingiberaceae	Herb
<i>Gloriosa superba</i> L.	Colchicaceae	Herb
<i>Grangea maderaspatana</i> (L.) Poir.	Asteraceae	Herb
<i>Grewia asiatica</i> L.	Malvaceae	Herb
<i>Hedychium coccineum</i> Buch.-Ham. ex Sm.	Zingiberaceae	Herb
<i>Hedychium coronarium</i> J.Koenig	Zingiberaceae	Herb
<i>Hedychium thyriforme</i> Sm.	Zingiberaceae	Herb

<i>Heliconia metallica</i> Planch. & Linden ex Hook.	Heliconiaceae	Herb
<i>Heliconia psittacorum</i> L.f.	Heliconiaceae	Herb
<i>Heliotropium indicum</i> L.	Boraginaceae	Herb
<i>Homalomena rubescens</i> (Roxb.) Kunth	Araceae	Herb
<i>Houttuynia cordata</i> Thunb.	Saururaceae	Herb
<i>Hybanthus enneaspermus</i> (L.) F.Muell.	Violaceae	Herb
<i>Hydrangea macrophylla</i> (Thunb.) Ser.	Hydrangeaceae	Herb
<i>Hydrocotyle himalaica</i> P.K. Mukh.	Apiaceae	Herb
<i>Hydrocotyle sibthorpioides</i> Lam.	Apiaceae	Herb
<i>Hygrophila auriculata</i> (Schumach.) Heine	Acanthaceae	Herb
<i>Hygrophila polysperma</i> (Roxb.) T.Anderson	Acanthaceae	Herb
<i>Hygrophila ringens</i> (L.) R. Br. ex Spreng.	Acanthaceae	Herb
<i>Hygroryza aristata</i> (Retz.) Nees ex Wight & Arn.	Poaceae	Herb
<i>Hyptis suaveolens</i> (L.) Poit.	Lamiaceae	Herb
<i>Imperata cylindrica</i> (L.) Raeusch.	Poaceae	Herb
<i>Justicia gendarussa</i> Burm.f.	Acanthaceae	Herb
<i>Kaempferia galanga</i> L.	Zingiberaceae	Herb
<i>Kaempferia rotunda</i> L.	Zingiberaceae	Herb
<i>Kyllinga brevifolia</i> Rottb.	Cyperaceae	Herb
<i>Kyllinga nemoralis</i> (J.R.Forst. & G.Forst.) Dandy ex Hutch. & Dalziel	Cyperaceae	Herb
<i>Lindernia antipoda</i> (L.) Alston	Linderniaceae	Herb
<i>Lindernia ciliata</i> (Colsm.) Pennell	Linderniaceae	Herb
<i>Lindernia parviflora</i> (Roxb.) Haines	Linderniaceae	Herb
<i>Lippia alba</i> (Mill.) N.E.Br. ex Britton & P.Wilson	Verbenaceae	Herb
<i>Ludwigia adscendens</i> (L.) H.Hara	Onagraceae	Herb
<i>Ludwigia octovalvis</i> (Jacq.) P.H. Raven	Onagraceae	Herb
<i>Ludwigia perennis</i> L.	Onagraceae	Herb
<i>Maranta arundinacea</i> L.	Marantaceae	Herb
<i>Melastoma</i> sp.	Melastomataceae	Herb
<i>Melilotus albus</i> Medik.	Fabaceae	Herb
<i>Mentha × piperita</i> L.	Lamiaceae	Herb
<i>Mentha arvensis</i> L.	Lamiaceae	Herb
<i>Mentha longifolia</i> (L.) L.	Lamiaceae	Herb
<i>Mentha spicata</i> L.	Lamiaceae	Herb
<i>Mimosa himalayana</i> Gamble	Fabaceae	Herb
<i>Mimosa invisa</i> Colla	Fabaceae	Herb
<i>Mimosa pudica</i> L.	Fabaceae	Herb
<i>Mirabilis jalapa</i> L.	Nyctaginaceae	Herb
<i>Molineria capitulata</i> (Lour.) Herb.	Hypoxidaceae	Herb
<i>Monochoria vaginalis</i> (Burm.f.) C.Presl	Pontederiaceae	Herb

<i>Monstera deliciosa</i> Liebm.	Araceae	Herb
<i>Muehlenbeckia platyclados</i> (F.Muell.) Meisn.	Polygonaceae	Herb
<i>Naravelia zeylanica</i> (L.) DC.	Ranunculaceae	Herb
<i>Nelumbo nucifera</i> Gaertn.	Nelumbonaceae	Herb
<i>Nicotiana plumbaginifolia</i> Viv.	Solanaceae	Herb
<i>Nicotiana tabacum</i> L.	Solanaceae	Herb
<i>Nigella sativa</i> L.	Ranunculaceae	Herb
<i>Nymphaea nouchali</i> Burm.f.	Nymphaeaceae	Herb
<i>Ocimum americanum</i> L.	Lamiaceae	Herb
<i>Ocimum basilicum</i> L.	Lamiaceae	Herb
<i>Ocimum campechianum</i> Mill.	Lamiaceae	Herb
<i>Ocimum gratissimum</i> L.	Lamiaceae	Herb
<i>Ocimum kilimandscharicum</i> Gürke	Lamiaceae	Herb
<i>Ocimum tenuiflorum</i> L.	Lamiaceae	Herb
<i>Oenanthe javanica</i> (Blume) DC.	Apiaceae	Herb
<i>Oldenlandia diffusa</i> (Willd.) Roxb.	Rubiaceae	Herb
<i>Oldenlandia corymbosa</i> L.	Rubiaceae	Herb
<i>Oplismenus burmanni</i> (Retz.) P.Beauv.	Poaceae	Herb
<i>Oplismenus compositus</i> (L.) P.Beauv.	Poaceae	Herb
<i>Oxalis corniculata</i> L.	Oxalidaceae	Herb
<i>Oxalis debilis</i> var. <i>corymbosa</i> (DC.) Lourteig	Oxalidaceae	Herb
<i>Oxalis latifolia</i> Kunth	Oxalidaceae	Herb
<i>Paspalum conjugatum</i> P.J.Bergius	Poaceae	Herb
<i>Paspalum distichum</i> L.	Poaceae	Herb
<i>Pennisetum glaucum</i> (L.) R.Br.	Poaceae	Herb
<i>Persicaria barbata</i> (L.) H.Hara	Polygonaceae	Herb
<i>Persicaria capitata</i> (Buch.-Ham. ex D.Don) H.Gross	Polygonaceae	Herb
<i>Persicaria chinensis</i> (L.) H. Gross	Polygonaceae	Herb
<i>Persicaria glabra</i> (Willd.) M.Gómez	Polygonaceae	Herb
<i>Persicaria hydropiper</i> (L.) Delarbre	Polygonaceae	Herb
<i>Persicaria orientalis</i> (L.) Spach	Polygonaceae	Herb
<i>Persicaria strigosa</i> (R.Br.) Nakai	Polygonaceae	Herb
<i>Persicaria tenella</i> (Blume) H. Hara	Polygonaceae	Herb
<i>Phaius tankervilleae</i> (Banks) Blume	Orchidaceae	Herb
<i>Phaulopsis imbricata</i> (Forssk.) Sweet	Acanthaceae	Herb
<i>Phlogacanthus thyriformis</i> (Roxb. ex Hardw.) Mabb.	Acanthaceae	Herb
<i>Phyllanthus amarus</i> Schumach. & Thonn.	Phyllanthaceae	Herb
<i>Phyllanthus fraternus</i> G.L.Webster	Phyllanthaceae	Herb
<i>Phyllanthus reticulatus</i> Poir.	Phyllanthaceae	Herb
<i>Phyllanthus urinaria</i> L.	Phyllanthaceae	Herb
<i>Physalis divaricata</i> D. Don	Solanaceae	Herb



<i>Physalis minima</i> L.	Solanaceae	Herb
<i>Plantago asiatica</i> subsp. <i>erosa</i> (Wall.) Z.Yu Li	Plantaginaceae	Herb
<i>Plectranthus amboinicus</i> (Lour.) Spreng.	Lamiaceae	Herb
<i>Plectranthus barbatus</i> Andrews	Lamiaceae	Herb
<i>Plumbago zeylanica</i> L.	Plumbaginaceae	Herb
<i>Pogostemon cablin</i> (Blanco) Benth.	Lamiaceae	Herb
<i>Polygonum pubescens</i> Blume	Polygonaceae	Herb
<i>Polygonum viscosum</i> Buch.-Ham. ex D. Don	Polygonaceae	Herb
<i>Polygonum plebeium</i> R.Br.	Polygonaceae	Herb
<i>Portulaca oleracea</i> L.	Portulacaceae	Herb
<i>Potamogeton octandrus</i> Poir.	Potamogetonaceae	Herb
<i>Pouzolzia</i> sp.	Urticaceae	Herb
<i>Pouzolzia hirta</i> Blume ex Hassk.	Urticaceae	Herb
<i>Pouzolzia zeylanica</i> (L.) Benn.	Urticaceae	Herb
<i>Pycnus flavidus</i> (Retz.) T.Koyama.	Cyperaceae	Herb
<i>Raphanus raphanistrum</i> subsp. <i>sativus</i> (L.) Domin	Brassicaceae	Herb
<i>Rosmarinus officinalis</i> L.	Lamiaceae	Herb
<i>Rotala rotundifolia</i> (Buch.-Ham. ex Roxb.) Koehne	Lythraceae	Herb
<i>Rumex dentatus</i> L.	Polygonaceae	Herb
<i>Rumex maritimus</i> L.	Polygonaceae	Herb
<i>Rungia pectinata</i> (L.) Nees	Acanthaceae	Herb
<i>Ruscus aculeatus</i> L.	Asparagaceae	Herb
<i>Saccharum spontaneum</i> L.	Poaceae	Herb
<i>Sansevieria hyacinthoides</i> (L.) Druce	Asparagaceae	Herb
<i>Sauropus androgynus</i> (L.) Merr.	Phyllanthaceae	Herb
<i>Sauropus compressus</i> Müll.Arg.	Phyllanthaceae	Herb
<i>Schumannianthus dichotomus</i> (Roxb.) Gagnep.	Marantaceae	Herb
<i>Scoparia dulcis</i> L.	Plantaginaceae	Herb
<i>Senna occidentalis</i> (L.) Link	Fabaceae	Herb
<i>Senna sophera</i> (L.) Roxb.	Fabaceae	Herb
<i>Senna tora</i> (L.) Roxb.	Fabaceae	Herb
<i>Sesamum indicum</i> L.	Pedaliaceae	Herb
<i>Setaria palmifolia</i> (J.Koenig) Stapf	Poaceae	Herb
<i>Sida acuta</i> Burm.f.	Malvaceae	Herb
<i>Sida cordata</i> (Burm.f.) Borss.Waalk.	Malvaceae	Herb
<i>Sida cordifolia</i> L.	Malvaceae	Herb
<i>Sida rhombifolia</i> L.	Malvaceae	Herb
<i>Solanum americanum</i> Mill.	Solanaceae	Herb
<i>Solanum sisymbriifolium</i> Lam.	Solanaceae	Herb
<i>Solanum torvum</i> Sw.	Solanaceae	Herb
<i>Solanum viarum</i> Dunal	Solanaceae	Herb

<i>Solanum villosum</i> Mill.	Solanaceae	Herb
<i>Sonchus asper</i> (L.) Hill	Asteraceae	Herb
<i>Sphagneticola calendulacea</i> (L.) Pruski	Asteraceae	Herb
<i>Spinacia oleracea</i> L.	Amaranthaceae	Herb
<i>Sporobolus diandrus</i> (Retz.) P.Beauv.	Poaceae	Herb
<i>Stachytarpheta indica</i> (L.) Vahl	Verbenaceae	Herb
<i>Stellaria media</i> (L.) Vill.	Caryophyllaceae	Herb
<i>Stellaria wallichiana</i> Haines	Caryophyllaceae	Herb
<i>Stevia rebaudiana</i> (Bertoni) Bertoni	Asteraceae	Herb
<i>Swertia chirayita</i> (Roxb. ex Flem.) Karst.	Gentianaceae	Herb
<i>Tacca integrifolia</i> Ker Gawl.	Dioscoreaceae	Herb
<i>Tagetes erecta</i> L.	Asteraceae	Herb
<i>Talinum paniculatum</i> (Jacq.) Gaertn.	Talinaceae	Herb
<i>Thysanolaena latifolia</i> (Roxb. ex Hornem.) Honda	Poaceae	Herb
<i>Tridax procumbens</i> (L.) L.	Asteraceae	Herb
<i>Trigonella foenum-graecum</i> L.	Fabaceae	Herb
<i>Triumfetta pilosa</i> Roth	Malvaceae	Herb
<i>Triumfetta rhomboidea</i> Jacq.	Malvaceae	Herb
<i>Typha elephantina</i> Roxb.	Typhaceae	Herb
<i>Typhonium trilobatum</i> (L.) Schott	Araceae	Herb
<i>Uraria picta</i> (Jacq.) DC.	Fabaceae	Herb
<i>Urena lobata</i> L.	Malvaceae	Herb
<i>Urtica dioica</i> L.	Urticaceae	Herb
<i>Urtica parviflora</i> Roxb.	Urticaceae	Herb
<i>Vallaris solanacea</i> (Roth) Kuntze	Apocynaceae	Herb
<i>Vallisneria spiralis</i> L.	Hydrocharitaceae	Herb
<i>Wahlenbergia marginata</i> (Thunb.) A.DC.	Campanulaceae	Herb
<i>Xanthium strumarium</i> L.	Asteraceae	Herb
<i>Zingiber montanum</i> (J.Koenig) Link ex A.Dietr.	Zingiberaceae	Herb
<i>Zingiber officinale</i> Roscoe	Zingiberaceae	Herb
<i>Zingiber zerumbet</i> (L.) Roscoe ex Sm.	Zingiberaceae	Herb

Apocynaceae, Convolvulaceae, Cucurbitaceae, Dioscoreaceae, and Menispermaceae, are the most dominant species of climbers. Orchids and few ferns are the dominant epiphytes.

**Table 4: Climber flora of the campus**

<b>Taxon</b>	<b>Family</b>	<b>Habit</b>
<i>Abrus pulchellus</i> Thwaites	Fabaceae	Climber
<i>Ampelocissus latifolia</i> (Roxb.) Planch.	Vitaceae	Climber
<i>Ampelocissus sikkimensis</i> (M.A.Lawson) Planch.	Vitaceae	Climber

<i>Antigonon leptopus</i> Hook. & Arn.	Polygonaceae	Climber
<i>Argyreia roxburghii</i> (Wall.) Arn. ex Choisy	Convolvulaceae	Climber
<i>Aristolochia indica</i> L.	Aristolochiaceae	Climber
<i>Aristolochia saccata</i> Wall.	Aristolochiaceae	Climber
<i>Aristolochia tagala</i> Cham.	Aristolochiaceae	Climber
<i>Asparagus adscendens</i> Roxb.	Asparagaceae	Climber
<i>Asparagus officinalis</i> L.	Asparagaceae	Climber
<i>Asparagus racemosus</i> Willd.	Asparagaceae	Climber
<i>Cayratia trifolia</i> (L.) Domin	Vitaceae	Climber
<i>Celastrus paniculatus</i> Willd.	Celastraceae	Climber
<i>Cissampelos pareira</i> L.	Menispermaceae	Climber
<i>Cissus adnata</i> Roxb.	Vitaceae	Climber
<i>Cissus quadrangularis</i> L.	Vitaceae	Climber
<i>Citrullus colocynthis</i> (L.) Schrad.	Cucurbitaceae	Climber
<i>Clitoria ternatea</i> L.	Fabaceae	Climber
<i>Coccinia grandis</i> (L.) Voigt	Cucurbitaceae	Climber
<i>Cocculus hirsutus</i> (L.) W.Theob.	Menispermaceae	Climber
<i>Cryptolepis dubia</i> (Burm.f.) M.R.Almeida	Apocynaceae	Climber
<i>Cuscuta campestris</i> Yunck.	Convolvulaceae	Climber
<i>Cuscuta reflexa</i> Roxb.	Convolvulaceae	Climber
<i>Dioscorea alata</i> L.	Dioscoreaceae	Climber
<i>Dioscorea bulbifera</i> L.	Dioscoreaceae	Climber
<i>Dioscorea deltoidea</i> Wall. ex Griseb.	Dioscoreaceae	Climber
<i>Dioscorea esculenta</i> (Lour.) Burkill	Dioscoreaceae	Climber
<i>Dioscorea pentaphylla</i> L.	Dioscoreaceae	Climber
<i>Dioscorea prazeri</i> Prain & Burkill	Dioscoreaceae	Climber
<i>Diplocyclos palmatus</i> (L.) C.Jeffrey	Cucurbitaceae	Climber
<i>Dischidia bengalensis</i> Colebr.	Apocynaceae	Climber
<i>Gymnema sylvestre</i> (Retz.) R.Br. ex Sm.	Apocynaceae	Climber
<i>Hemidesmus indicus</i> (L.) R. Br. ex Schult.	Apocynaceae	Climber
<i>Hoya parasitica</i> Wall. ex Wight	Apocynaceae	Climber
<i>Ipomoea aquatica</i> Forssk.	Convolvulaceae	Climber
<i>Ipomoea nil</i> (L.) Roth	Convolvulaceae	Climber
<i>Ipomoea quamoclit</i> L.	Convolvulaceae	Climber
<i>Jasminum grandiflorum</i> L.	Oleaceae	Climber
<i>Momordica charantia</i> L.	Cucurbitaceae	Climber
<i>Momordica dioica</i> Roxb. ex Willd.	Cucurbitaceae	Climber
<i>Mucuna pruriens</i> (L.) DC.	Fabaceae	Climber
<i>Paederia foetida</i> L.	Rubiaceae	Climber
<i>Passiflora edulis</i> Sims	Passifloraceae	Climber
<i>Passiflora foetida</i> L.	Passifloraceae	Climber

<i>Passiflora quadrangularis</i> L.	Passifloraceae	Climber
<i>Pergularia daemia</i> (Forssk.) Chiov.	Apocynaceae	Climber
<i>Pericampylus glaucus</i> (Lam.) Merr.	Menispermaceae	Climber
<i>Piper betle</i> L.	Piperaceae	Climber
<i>Piper longum</i> L.	Piperaceae	Climber
<i>Piper nigrum</i> L.	Piperaceae	Climber
<i>Piper retrofractum</i> Vahl	Piperaceae	Climber
<i>Pothos scandens</i> L.	Araceae	Climber
<i>Rubia charifolia</i> Wall. ex G.Don	Rubiaceae	Climber
<i>Rubia manjith</i> Roxb. ex Fleming	Rubiaceae	Climber
<i>Rubus splendidissimus</i> H.Hara	Rosaceae	Climber
<i>Smilax ovalifolia</i> Roxb. ex D.Don	Smilacaceae	Climber
<i>Solena amplexicaulis</i> (Lam.) Gandhi	Cucurbitaceae	Climber
<i>Stephania glabra</i> (Roxb.) Miers	Menispermaceae	Climber
<i>Stephania japonica</i> (Thunb.) Miers	Menispermaceae	Climber
<i>Stephania elegans</i> Hook. f. & Thomson	Menispermaceae	Climber
<i>Teramnus labialis</i> (L.f.) Spreng.	Fabaceae	Climber
<i>Tetracera sarmentosa</i> (L.) Vahl	Dilleniaceae	Climber
<i>Tetrastigma bracteolatum</i> (Wall.) Planch.	Vitaceae	Climber
<i>Tetrastigma campylocarpum</i> (Kurz) Planch.	Vitaceae	Climber
<i>Tetrastigma planicaule</i> (Hook. f.) Gagnep.	Vitaceae	Climber
<i>Tetrastigma serrulatum</i> (Roxb.) Planch.	Vitaceae	Climber
<i>Thunbergia fragrans</i> Roxb.	Acanthaceae	Climber
<i>Thunbergia grandiflora</i> (Roxb. ex Rottl.) Roxb.	Acanthaceae	Climber
<i>Tinospora sinensis</i> (Lour.) Merr.	Menispermaceae	Climber
<i>Tragia involucrata</i> L.	Euphorbiaceae	Climber
<i>Trichosanthes dioica</i> Roxb.	Cucurbitaceae	Climber
<i>Trichosanthes lepiniana</i> (Naudin) Cogn.	Cucurbitaceae	Climber
<i>Trichosanthes tricuspidata</i> Lour.	Cucurbitaceae	Climber
<i>Tylophora indica</i> (Burm. f.) Merr.	Apocynaceae	Climber

**Table 5: Orchid flora of the campus**

<b>Taxon</b>	<b>Family</b>	<b>Habit</b>
<i>Acampe praemorsa</i> (Roxb.) Blatt. & McCann.	Orchidaceae	Epiphyte
<i>Aerides multiflora</i> Roxb.	Orchidaceae	Epiphyte
<i>Aerides odorata</i> Lour.	Orchidaceae	Epiphyte
<i>Arundina graminifolia</i> (D.Don) Hochr.	Orchidaceae	Epiphyte
<i>Ascocentrum ampullaceum</i> (Roxb.) Schltr.	Orchidaceae	Epiphyte
<i>Bulbophyllum</i> sp.	Orchidaceae	Epiphyte

<i>Bulbophyllum careyanum</i> (Hook.) Spreng.	Orchidaceae	Epiphyte
<i>Coelogyne fuscescens</i> Lindl.	Orchidaceae	Epiphyte
<i>Coelogyne prolifera</i> Lindl.	Orchidaceae	Epiphyte
<i>Cryptochilus luteus</i> Lindl.	Orchidaceae	Epiphyte
<i>Cymbidium aloifolium</i> (L.) Sw.	Orchidaceae	Epiphyte
<i>Dendrobium anceps</i> Sw.	Orchidaceae	Epiphyte
<i>Dendrobium aphyllum</i> (Roxb.) C.E.C.Fisch.	Orchidaceae	Epiphyte
<i>Dendrobium crepidatum</i> Lindl. & Paxton	Orchidaceae	Epiphyte
<i>Dendrobium densiflorum</i> Lindl.	Orchidaceae	Epiphyte
<i>Dendrobium farmeri</i> Paxton	Orchidaceae	Epiphyte
<i>Dendrobium fimbriatum</i> Hook.	Orchidaceae	Epiphyte
<i>Dendrobium fugax</i> Rchb.f.	Orchidaceae	Epiphyte
<i>Dendrobium jenkinsii</i> Wall. ex Lindl.	Orchidaceae	Epiphyte
<i>Dendrobium moschatum</i> (Buch.-Ham.) Sw.	Orchidaceae	Epiphyte
<i>Dendrobium nobile</i> Lindl.	Orchidaceae	Epiphyte
<i>Dendrobium stupeosum</i> Lindl.	Orchidaceae	Epiphyte
<i>Dendrobium sulcatum</i> Lindl.	Orchidaceae	Epiphyte
<i>Goodyera procera</i> (Ker Gawl.) Hook.	Orchidaceae	Epiphyte
<i>Micropera obtusa</i> (Lindl.) Tang & F.T.Wang	Orchidaceae	Epiphyte
<i>Panisea uniflora</i> (Lindl.) Lindl.	Orchidaceae	Epiphyte
<i>Paphiopedilum insigne</i> (Wall. ex Lindl.) Pfitzer	Orchidaceae	Epiphyte
<i>Papilionanthe teres</i> (Roxb.) Schltr.	Orchidaceae	Epiphyte
<i>Phalaenopsis mannii</i> Rchb.f.	Orchidaceae	Epiphyte
<i>Pholidota articulata</i> Lindl.	Orchidaceae	Epiphyte
<i>Pholidota imbricata</i> Lindl.	Orchidaceae	Epiphyte
<i>Pinalia bractescens</i> (Lindl.) Kuntze	Orchidaceae	Epiphyte
<i>Pinalia pumila</i> (Lindl.) Kuntze	Orchidaceae	Epiphyte
<i>Rhynchostylis retusa</i> (L.) Blume	Orchidaceae	Epiphyte
<i>Smitinandia micrantha</i> (Lindl.) Holttum	Orchidaceae	Epiphyte
<i>Spiranthes sinensis</i> (Pers.) Ames	Orchidaceae	Epiphyte
<i>Vanda coerulea</i> Griff. ex Lindl.	Orchidaceae	Epiphyte
<i>Vanilla planifolia</i> Jacks. ex Andrews	Orchidaceae	Epiphyte

### **Centre for Conservation & Utilization of Medicinal and Aromatic plants (CCUMAP):**

The richness of the flora of Eastern Himalaya is well known. It forms the eastern part of the IUCN recognised Himalaya Hotspot for Conservation. This part of Himalayas is ranging from the Eastern Part of Nepal, passing through Sikkim, Darjeeling part of West Bengal, Bhutan, Arunachal Pradesh and ultimately coming down to the plains in Myanmar. This entire region attracts the plant lovers round the year and from round the earth.

Man also inhabits this region since long. They are living in innumerable far flung areas and almost detached from the so called civilized society. All the resources for their survival are coming from the vegetation around them. The resources include food, fodder, medicine, house building materials etc.

The Centre for Conservation & Utilization of Medicinal and Aromatic Plants earlier known as NBU medicinal plant garden is one of important centre at University and is Located almost at middle part of the Campus opposite to Akshay Dham museum. The Garden is spread over an area of 5 acre land and is with well boundary with concrete and iron wear in all the side. This medicinal plant garden was established with financial assistance from NMPB and RKVY. The garden having one big entry gate along with the sports board and one small gate on Health centre side. The garden is divided into three parts viz., a. Block A, b. Block B and c. Block C. The garden having two net houses and one temporary Orchid rescue net house for shade loving species. A Good environment for all groups like aquatic plants, terrestrial, epiphytes, orchids, ferns, gymnosperms are maintaining using various upgraded scientific techniques. Specimens of aromatic, medicinal and rare or threatened category with taken from various wilderness of Himalaya, western Ghats, Eastern Ghats and other various states of India. Sometimes we purchase the plantlets and seeds from various reputed nurseries and also bring through specimens exchange with various Botanical gardens, Universities and centres on request.

**Medicinal Plant resources:** The medicinal plant garden of N.B.U contributes a great resource towards the conservation and utilisation of over 625 species of medicinally important plants. Presently, this garden harbours the following medicinal plants: *Ambroma augusta*, *Andrographis paniculata*, *Asparagus racemosus*, *Azadirachta indica*, *Bacopa monnieri*, *Caesalpinia bonduc*, *Cissus quadrangularis*, *Coccinia grandis*, *Costus speciosus*, *Eclipta prostate*, *Enydra fluctuens*, *Hemidesmus indicus*, *Holarrhena pubescens*, *Kaempferia galanga*, *Kalanchoe pinnata*, *Mesua ferrea*, *Mucuna pruriens*, *Phlogacanthus thyrsiformis*, *Phyllanthus emblica*, *Rauwolfia serpentine*, *Stevia rabaudiana*, *Terminalia bellirica*, *Terminalia chebula*, *Tinospora cordifolia*, *Vitex negundo*, *Withania somnifera* etc.

**Aromatic Plant Resources:** Aromatic plants form the major domain in the medicinal plant world. The medicinal plant garden is now conserving quite a good number (around 40 species) of aromatic plants: *Aloe jucunda*, *Aloe vera*, *Artemisia annua*, *Artemisia indica*, *Bacopa monnieri*, *Cassia mimosoides*, *Centella asiatica*, *Cinnamomum camphora*, *Cinnamomum glaucescens*, *Cinnamomum tamala*, *Cinnamomum zaylanicum*, *Citrus maxima*, *Cymbopogon citrates*, *Cymbopogon pendulus*, *Gloriosa superb*, *Mentha arvensis*, *Mentha piperita*, *Ocimum basilicum*, *Ocimum camechianum*, *Ocimum sanctum*, *Piper betle*, *Piper longum*, *Zingiber cassumunar*, *Zingiber officinale*, *Zingiber zerumbet* etc.

**Rare and threatened Plant resources:** The medicinal plant garden of University of North Bengal has been playing a pivotal role in conserving the rare and threatened plant species. It can be considered as a major *ex-situ* conservatory not only of university but also for North Bengal as a whole. Some of them are *Angiopteris erecta*, *Agathis sp.*, *Cinchona sp.*, *Gingo biloba*, *Gnetum ula*, *Gnetum gnemon*, *Helminhostachys zeylanica*, *Salvinia cucullata*, *Psilotum sp.*, *Podocarpus sp.*

### **Facilities Available in the Garden:**

There are nearly three hundred demarcated beds for growing medicinal plants. Many plants are maintained in pots and many others are growing outside the demarcated plots. However following facilities in the garden can be recognised:

1. Conservation Beds
2. Tank for growing aquatic plants
3. Net houses for conservation of rare and shade loving plants
4. Hydropit Propagation Chamber
5. Mist Chamber for Propagation
6. Humus & FYM pits
7. Vermicompost Pit
8. Nursery Beds
9. Store Room
10. Dug well with submersible pump
11. Irrigation system with water taps and sprinkles
12. Demonstration Plots for the cultivation of Medicinal Plants etc.

It is expected that some other facilities like (i) a quality assessment laboratory, (ii) one more net house, (iii) a training room etc will be introduced in future.

### **Activities of the Garden:**

Though the main purpose of this garden is the conservation of Medicinal Plants of North Bengal and nearby areas, but a large number of plants procured from different parts of India and many interesting exotics are also now growing and preserved in this garden. At this moment, there are over 625 species of plants growing the garden. However, activities based on this garden can be summarised as follows:

1. Conservation of Medicinal Plants
2. Propagation of rare and endangered plants
3. Mass propagation of commercially viable Medicinal Plants for cultivation
4. Training programs for interested farmers
5. Field training in Demonstration Plots
6. Assisting in marketing of crude drug
7. Quality assessment of harvested products
8. Arranging regular awareness programs etc.

**Earlier Project run on garden:** The garden was established with financial assistance of several funding agencies like NMPB, DST, State Horticulture Ministry, etc.

**Annual Budget:** After the completion of the projects on Garden, University authority allotted a fund of Rs 480000/- per annum (increase 10% every year) to maintenance of this herbal garden.

Two daily wage labours and one supervisor are working and nurturing each of plants and part of the garden under able guidance of Dr. Monoranjan Chowdhury (Garden-in-charge).

**Beneficiary Groups:** The garden generate a good number of seeds, seedling, cutting of various aromatic and medicinal plants regularly and provide in limited numbers to the various groups (Students, teachers, researchers, farmers, Agricultural department, general people) who are interested to plant or used as medicines or for research purposes.

**UG student of Botany and School students as visitors:** During excursion several college group of Botany (Students & teachers) are regularly visit this garden and teachers allow them to enrich the knowledge about the aromatic & medicinal plants and also found them them exited when they see the rare species like *Gingo biloba*, *Gnetum ula*, *Gnetum gnemon*, *Psilotum* sp, various rare Orchids, ferns etc in this garden. The school students of nearby schools are also the regular visitors of the garden and they are very much recharge with live medicinal and rare such plant species.

**Provide assistance to developing Herbal Garden in Schools and Colleges:** We are also visited various UG colleges who are inspired with our garden and are requesting us for establishing such herbal garden in their college campus or school campus. After visit we suggest them the planning of the garden and probable plants that can be easily grown in the campus climate. After preparation of plots we provide them all the specimens in sufficient quantity, so they can make their herbal garden along with nourishing protocol for each species. We are also visit their garden on their request and tried to get feedbacks. Till date several educational institute like colleges/ schools were develop their herbal garden and /or enrich their garden taking the suggestions and specimens from our gardens.

**Training and Workshop for students:** Occasionally we are arranging the workshop cum training programs for farmers, students and research scholars who are interested to cultivation and propagation of Medicinal and aromatic plants. We arrange the lectures of various experts of medicinal plant, agricultural and forest officers to exchange their valuable information to farmers for the cultivation of medicinal plants as alternating crops in waste lands.

**Providing live samples to researchers:** Live samples of various species of aromatic and medicinal plant with sufficient quantity they required are regularly provided to research scholars and researchers who are working on medicinal potentiality of those plant drugs.

**Academic Staff College allot one class for each batch of RC in life science/OP participants:** UGC-ASC of this university arrange at least one full class for RC in life sciences and each batch of OP participants. One half all the participant visits this garden and enriches themselves with importance of plant drugs and also about the rare plant species. Sometimes they were takes few live seedling of various species for herbal gardens of their college and universities.

**Table 6: Checklist of medicinal plants from the campus**

Plant species	Plant species
Abelmoschus moschatus Medik.	Ichnocarpus frutescens (L.) W.T.Aiton
Abroma augusta (L.) L.f.	Imperata cylindrica (L.) Raeusch.



<i>Abrus precatorius</i> L.	<i>Indigofera tinctoria</i> L.
<i>Abutilon indicum</i> (L.) Sweet	<i>Ipomoea aquatica</i> Forssk.
<i>Acacia catechu</i> (L.f.) Willd.	<i>Ipomoea nil</i> (L.) Roth
<i>Acalypha indica</i> L.	<i>Ipomoea quamoclit</i> L.
<i>Acampe praemorsa</i> (Roxb.) Blatt. & McCann.	<i>Jasminum grandiflorum</i> L.
<i>Achyranthes aspera</i> L.	<i>Jasminum sambac</i> (L.) Aiton
<i>Achyranthes bidentata</i> Blume	<i>Jatropha curcas</i> L.
<i>Acmella uliginosa</i> (Sw.) Cass.	<i>Jatropha gossypifolia</i> L.
<i>Acorus calamus</i> L.	<i>Justicia adhatoda</i> L.
<i>Adenantha pavonina</i> L.	<i>Justicia gendarussa</i> Burm.f.
<i>Aegle marmelos</i> (L.) Corrêa	<i>Kaempferia galanga</i> L.
<i>Aerides odorata</i> Lour.	<i>Kaempferia rotunda</i> L.
<i>Aerva lanata</i> (L.) Juss.	<i>Lagerstroemia speciosa</i> (L.) Pers.
<i>Agave americana</i> L.	<i>Lanea coromandelica</i> (Houtt.) Merr.
<i>Ageratum conyzoides</i> (L.) L.	<i>Lantana × aculeata</i> L.
<i>Alangium chinense</i> (Lour.) Harms	<i>Lawsonia inermis</i> L.
<i>Albizia lebeck</i> (L.) Benth.	<i>Lippia alba</i> (Mill.) N.E.Br. ex Britton & P.Wilson
<i>Allium cepa</i> L.	<i>Litchi chinensis</i> Sonn.
<i>Allium sativum</i> L.	<i>Litsea glutinosa</i> (Lour.) C.B.Rob.
<i>Alocasia macrorrhizos</i> (L.) G.Don	<i>Litsea monopetala</i> (Roxb.) Pers.
<i>Aloe vera</i> (L.) Burm.f.	<i>Maesa indica</i> (Roxb.) A. DC.
<i>Alpinia galanga</i> (L.) Willd.	<i>Magnolia grandiflora</i> L.
<i>Alpinia malaccensis</i> (Burm.f.) Roscoe	<i>Magnolia champaca</i> (L.) Baill. ex Pierre
<i>Alpinia zerumbet</i> (Pers.) B.L.Burt & R.M.Sm.	<i>Mangifera indica</i> L.
<i>Alstonia scholaris</i> (L.) R. Br.	<i>Manilkara zapota</i> (L.) P.Royen
<i>Alternanthera sessilis</i> (L.) R.Br. ex DC.	<i>Melastoma malabathricum</i> L.
<i>Amaranthus blitum</i> subsp. <i>oleraceus</i> (L.) Costea.	<i>Melia azedarach</i> L.
<i>Amaranthus spinosus</i> L.	<i>Melilotus albus</i> Medik.
<i>Amomum subulatum</i> Roxb.	<i>Mentha × piperita</i> L.
<i>Anacardium occidentale</i> L.	<i>Mentha arvensis</i> L.
<i>Ananas comosus</i> (L.) Merr.	<i>Mentha longifolia</i> (L.) L.
<i>Andrographis paniculata</i> (Burm.f.) Nees	<i>Mesua ferrea</i> L.
<i>Anisomeles indica</i> (L.) Kuntze	<i>Mimosa himalayana</i> Gamble
<i>Annona reticulata</i> L.	<i>Mimusops elengi</i> L.
<i>Annona squamosa</i> L.	<i>Mirabilis jalapa</i> L.
<i>Aquilaria malaccensis</i> Lam.	<i>Momordica charantia</i> L.
<i>Areca catechu</i> L.	<i>Momordica dioica</i> Roxb. ex Willd.
<i>Argemone mexicana</i> L.	<i>Monochoria vaginalis</i> (Burm.f.) C.Presl
<i>Aristolochia indica</i> L.	<i>Morinda angustifolia</i> Roxb.
<i>Artemisia vulgaris</i> L.	<i>Moringa oleifera</i> Lam.

Artocarpus lacucha Buch.-Ham.	Morus alba L.
Asparagus adscendens Roxb.	Murraya koenigii (L.) Spreng.
Asparagus officinalis L.	Murraya paniculata (L.) Jack
Asparagus racemosus Willd.	Musa × paradisiaca L.
Averrhoa carambola L.	Myristica fragrans Houtt.
Ayapana triplinervis (Vahl) R.M.King & H.Rob.	Naravelia zeylanica (L.) DC.
Azadirachta indica A.Juss.	Nelumbo nucifera Gaertn.
Bacopa monnieri (L.) Wettst.	Neolamarckia cadamba (Roxb.) Bosser
Barleria cristata L.	Nicotiana tabacum L.
Barleria strigosa Willd.	Nigella sativa L.
Bauhinia acuminata L.	Nyctanthes arbor-tristis L.
Bauhinia purpurea L.	Nymphaea nouchali Burm.f.
Bergenia ciliata (Haw.) Sternb.	Ocimum americanum L.
Bidens pilosa L.	Ocimum basilicum L.
Biophytum reinwardtii (Zucc.) Klotzsch	Ocimum gratissimum L.
Bixa orellana L.	Ocimum kilimandscharicum Gürke
Blumea lacera (Burm.f.) DC.	Ocimum tenuiflorum L.
Boerhavia diffusa L.	Oenanthe javanica (Blume) DC.
Bombax ceiba L.	Oldenlandia corymbosa L.
Brassica juncea (L.) Czern.	Oroxylum indicum (L.) Kurz
Brassica rapa L.	Oxalis corniculata L.
Bridelia retusa (L.) A.Juss.	Paederia foetida L.
Brugmansia suaveolens (Humb. & Bonpl. ex Willd.) Bercht. & J.Presl.	Pandanus tectorius Parkinson ex Du Roi
Bryophyllum pinnatum (Lam.) Oken	Passiflora edulis Sims
Butea monosperma (Lam.) Taub.	Passiflora foetida L.
Caesalpinia bonduc (L.) Roxb.	Passiflora quadrangularis L.
Caesalpinia pulcherrima (L.) Sw.	Pergularia daemia (Forssk.) Chiov.
Cajanus cajan (L.) Millsp.	Pericampylus glaucus (Lam.) Merr.
Calotropis gigantea (L.) Dryand.	Persicaria glabra (Willd.) M.Gómez
Camellia sinensis (L.) Kuntze	Persicaria hydropiper (L.) Delarbre
Canna indica L.	Phaius tankervilleae (Banks) Blume
Careya arborea Roxb.	Phlogacanthus thyriformis (Roxb. ex Hardw.) Mabb.
Carica papaya L.	Pholidota articulata Lindl.
Cascabela thevetia (L.) Lippold	Pholidota imbricata Lindl.
Cassia fistula L.	Phyllanthus acidus (L.) Skeels
Catharanthus roseus (L.) G.Don	Phyllanthus amarus Schumach. & Thonn.
Cayratia trifolia (L.) Domin	Phyllanthus emblica L.
Ceiba pentandra (L.) Gaertn.	Phyllanthus fraternus G.L.Webster
Celastrus paniculatus Willd.	Phyllanthus urinaria L.
	Physalis minima L.

<i>Celosia argentea</i> L.	<i>Pimenta dioica</i> (L.) Merr.
<i>Centella asiatica</i> (L.) Urb.	<i>Pinus kesiya</i> Royle ex Gordon
<i>Cheilocostus speciosus</i> (J.Koenig) C.D.Specht	<i>Piper betle</i> L.
<i>Chenopodium album</i> L.	<i>Piper longum</i> L.
<i>Chlorophytum arundinaceum</i> Baker	<i>Piper nigrum</i> L.
<i>Cinnamomum camphora</i> (L.) J.Presl	<i>Pistia stratiotes</i> L.
<i>Cinnamomum tamala</i> (Buch.-Ham.) T.Nees & Eberm.	<i>Platyclusus orientalis</i> (L.) Franco
<i>Cinnamomum verum</i> J.Presl	<i>Plumbago zeylanica</i> L.
<i>Cissampelos pareira</i> L.	<i>Pogostemon cablin</i> (Blanco) Benth.
<i>Cissus quadrangularis</i> L.	<i>Polygonum plebeium</i> R.Br.
<i>Citrullus colocynthis</i> (L.) Schrad.	<i>Pongamia pinnata</i> (L.) Pierre
<i>Citrus limon</i> (L.) Osbeck	<i>Portulaca oleracea</i> L.
<i>Citrus maxima</i> (Burm.) Merr.	<i>Pothos scandens</i> L.
<i>Citrus medica</i> L.	<i>Psidium guajava</i> L.
<i>Cleome viscosa</i> L.	<i>Punica granatum</i> L.
<i>Clerodendrum indicum</i> (L.) Kuntze	<i>Putranjiva roxburghii</i> Wall.
<i>Clerodendrum infortunatum</i> L.	<i>Rauvolfia tetraphylla</i> L.
<i>Clitoria ternatea</i> L.	<i>Rauvolfia serpentina</i> (L.) Benth. ex Kurz
<i>Cocculus hirsutus</i> (L.) W.Theob.	<i>Rhododendron arboreum</i> Sm.
<i>Coffea arabica</i> L.	<i>Rhynchosyilis retusa</i> (L.) Blume
<i>Coix lacryma-jobi</i> L.	<i>Ricinus communis</i> L.
<i>Coleus forskohlii</i> (Willd.) Briq.	<i>Rosmarinus officinalis</i> L.
<i>Colocasia esculenta</i> (L.) Schott	<i>Rubus ellipticus</i> Sm.
<i>Commelina benghalensis</i> L.	<i>Rumex dentatus</i> L.
<i>Coriandrum sativum</i> L.	<i>Rumex maritimus</i> L.
<i>Crinum asiaticum</i> L.	<i>Rungia pectinata</i> (L.) Nees
<i>Curculigo orchioides</i> Gaertn.	<i>Ruscus aculeatus</i> L.
<i>Curcuma amada</i> Roxb.	<i>Saccharum spontaneum</i> L.
<i>Curcuma aromatica</i> Salisb.	<i>Salix tetrasperma</i> Roxb.
<i>Curcuma caesia</i> Roxb.	<i>Sansevieria hyacinthoides</i> (L.) Druce
<i>Curcuma longa</i> L.	<i>Santalum album</i> L.
<i>Curcuma zedoaria</i> (Christm.) Roscoe	<i>Saraca asoca</i> (Roxb.) Willd.
<i>Cuscuta reflexa</i> Roxb.	<i>Sauropus androgynus</i> (L.) Merr.
<i>Cymbidium aloifolium</i> (L.) Sw.	<i>Schima wallichii</i> Choisy
<i>Cymbopogon citratus</i> (DC.) Stapf	<i>Scoparia dulcis</i> L.
<i>Cynodon dactylon</i> (L.) Pers.	<i>Senna alata</i> (L.) Roxb.
<i>Cyperus rotundus</i> L.	<i>Senna occidentalis</i> (L.) Link
<i>Dalbergia sissoo</i> DC.	<i>Senna sophera</i> (L.) Roxb.
<i>Dalbergia latifolia</i> Roxb.	<i>Senna tora</i> (L.) Roxb.
<i>Datura metel</i> L.	<i>Sesamum indicum</i> L.

<i>Datura stramonium</i> L.	<i>Sesbania grandiflora</i> (L.) Pers.
<i>Daucus carota</i> L.	<i>Sesbania sesban</i> (L.) Merr.
<i>Dendrobium aphyllum</i> (Roxb.) C.E.C.Fisch.	<i>Shorea robusta</i> Gaertn.
<i>Dendrobium densiflorum</i> Lindl.	<i>Sida acuta</i> Burm.f.
<i>Dendrobium nobile</i> Lindl.	<i>Sida cordifolia</i> L.
<i>Desmodium gangeticum</i> (L.) DC.	<i>Sida rhombifolia</i> L.
<i>Desmodium triflorum</i> (L.) DC.	<i>Simarouba amara</i> Aubl.
<i>Dillenia indica</i> L.	<i>Smilax ovalifolia</i> Roxb. ex D.Don
<i>Dioscorea alata</i> L.	<i>Solanum americanum</i> Mill.
<i>Dioscorea bulbifera</i> L.	<i>Solanum torvum</i> Sw.
<i>Dioscorea deltoidea</i> Wall. ex Griseb.	<i>Sonchus asper</i> (L.) Hill
<i>Dioscorea esculenta</i> (Lour.) Burkill	<i>Spathodea campanulata</i> P.Beauv.
<i>Dioscorea pentaphylla</i> L.	<i>Spinacia oleracea</i> L.
<i>Dioscorea prazeri</i> Prain & Burkill	<i>Spondias pinnata</i> (L. f.) Kurz
<i>Diospyros malabarica</i> (Desr.) Kostel.	<i>Stachytarpheta indica</i> (L.) Vahl
<i>Dipterocarpus turbinatus</i> C.F.Gaertn	<i>Stellaria media</i> (L.) Vill.
<i>Eclipta prostrata</i> (L.) L.	<i>Stephania glabra</i> (Roxb.) Miers
<i>Elaeocarpus floribundus</i> Blume	<i>Stephania japonica</i> (Thunb.) Miers
<i>Elaeocarpus serratus</i> L.	<i>Streblus asper</i> Lour.
<i>Elephantopus scaber</i> L.	<i>Strychnos nux-vomica</i> L.
<i>Emilia sonchifolia</i> (L.) DC. ex DC.	<i>Swertia chirayita</i> (Roxb. ex Flem.) Karst.
<i>Enydra fluctuans</i> DC.	<i>Syzygium jambos</i> (L.) Alston
<i>Eryngium foetidum</i> L.	<i>Syzygium cumini</i> (L.) Skeels
<i>Erythrina variegata</i> L.	<i>Tabernaemontana divaricata</i> (L.) R.Br. ex Roem. & Schult.
<i>Euphorbia hirta</i> L.	<i>Tacca integrifolia</i> Ker Gawl.
<i>Euphorbia neriifolia</i> L.	<i>Tagetes erecta</i> L.
<i>Euphorbia royleana</i> Boiss.	<i>Tamarindus indica</i> L.
<i>Euphorbia tirucalli</i> L.	<i>Taxus baccata</i> L.
<i>Euryale ferox</i> Salisb.	<i>Tectona grandis</i> L.f.
<i>Ficus benghalensis</i> L.	<i>Terminalia arjuna</i> (Roxb. ex DC.) Wight & Arn.
<i>Ficus benjamina</i> L.	<i>Terminalia bellirica</i> (Gaertn.) Roxb.
<i>Ficus hispida</i> L.f.	<i>Terminalia chebula</i> Retz.
<i>Ficus racemosa</i> L.	<i>Terminalia myriocarpa</i> Van Heurck & Müll. Arg.
<i>Ficus religiosa</i> L.	<i>Tetrastigma serrulatum</i> (Roxb.) Planch.
<i>Ficus semicordata</i> Buch.-Ham. ex Sm.	<i>Theobroma cacao</i> L.
<i>Flacourtia indica</i> (Burm.f.) Merr.	<i>Thunbergia grandiflora</i> (Roxb. ex Rottl.) Roxb.
<i>Flacourtia jangomas</i> (Lour.) Raeusch.	<i>Tinospora sinensis</i> (Lour.) Merr.
<i>Foeniculum vulgare</i> Mill.	<i>Tragia involucrata</i> L.
<i>Gardenia jasminoides</i> J.Ellis	<i>Trema orientalis</i> (L.) Blume

Ginkgo biloba L.	Trichosanthes dioica Roxb.
Girardinia diversifolia (Link) Friis	Trichosanthes lepiniana (Naudin) Cogn.
Gloriosa superba L.	Tridax procumbens (L.) L.
Glycosmis pentaphylla (Retz.) DC.	Trigonella foenum-graecum L.
Gmelina arborea Roxb.	Triumfetta rhomboidea Jacq.
Gossypium arboreum L.	Tylophora indica (Burm. f.) Merr.
Grangea maderaspatana (L.) Poir.	Typha elephantina Roxb.
Grewia asiatica L.	Typhonium trilobatum (L.) Schott
Gymnema sylvestre (Retz.) R.Br. ex Sm.	Uraria picta (Jacq.) DC.
Gynocardia odorata R.Br.	Urena lobata L.
Hedychium coronarium J.Koenig	Urtica dioica L.
Heliotropium indicum L.	Urtica parviflora Roxb.
Hemidesmus indicus (L.) R. Br. ex Schult.	Vallisneria spiralis (L.) Kuntze
Hibiscus mutabilis L.	Vitex negundo L.
Hibiscus rosa-sinensis L.	Withania somnifera (L.) Dunal
Holarrhena pubescens Wall. ex G.Don	Wrightia arborea (Dennst.) Mabb.
Houttuynia cordata Thunb.	Xanthium strumarium L.
Hoya parasitica Wall. ex Wight	Zanthoxylum budrunga DC.
Hybanthus enneaspermus (L.) F.Muell.	Zingiber montanum (J.Koenig) Link ex A.Dietr.
Hygrophila auriculata (Schumach.) Heine	Zingiber officinale Roscoe
Hyptis suaveolens (L.) Poit.	Zingiber zerumbet (L.) Roscoe ex Sm.

## PLANT DISEASES OF THE CAMPUS

Scientific study of plant diseases is known as plant pathology, diseases caused to plants by pathogens (infectious organism) and environmental conditions (physical factors). Organisms that cause infectious disease include fungi, Bacteria, viruses, protozoa, nematodes and parasitic plants also. Plant diseases also involve the study of pathogen identification, disease etiology, disease cycles, economic impact, plant disease epidemiology, plant disease resistance and management of plant disease.

In the campus of the University 6859 plants (tree, shrubs, climbers and herbs) are present, out of these only few plants are infected by some diseases. The observations of present investigation found only 72 plants are diseased by different pathogens and remaining plants are found disease free. Fungi like Fusarium, Phytophthora, and Alternaria causes disease like leaf spot, leaf blight, canker disease to certain plants, some Mycorrhiza found causes diseases to root of some tree species, Mycoplasmal diseases are also found to Santalum albus, little leaf of Santalum, economically and medicinally important plant. Some tree species are found to cause root diseases by soil fungi, Gmelina arborea causes to disease by Fusarium oxysporum.

Result of the present investigation is out of 6859 trees only 72 plants are found infected by pathogens, remaining plants are disease free.

In this connection, the Dept. of Botany and the experts of Uttarbanga Krishi Viswavidyalaya (U.B.K.V.) help us time to time.

### Faunal Diversity

The faunal diversity of the campus includes a good number of birds, a large number of insects (including butterflies, cicadas, dragonflies and damselflies, grasshoppers, plants hoppers, hoppers, lattern flies, mantis, etc.). *Graphium doson*, *Graphium agamemnon*, *Papilio prexaspes*, *Papilio polytes*, *Pachliopta aristolochiae*, *Pseudocoladenia dan*, *Ampittia dioscorides*, *Oriens goloides*, *Catopsilia pyranthe*, *Eurema hecabe*, *Euploea core*, etc. are most common species of butterflies. A total 79 species of birds have been recorded recently. *Atretium schistosum*, *Xenochrophis piscator*, *Enhydris enhydris*, *Ptyas korros*, *Python molurus*, *Chrysopelea ornate*, etc. are common snakes in the campus. Rodents, *Herpestes edwardsii*, and bats are most seen mammals. A paper reported total 69 species of damselflies and dragonflies (odonata).

**Table 7: Bird fauna of the campus**

Sl. No	Family	Species	Common Name
1	Accipitridae	<i>Accipiter badius</i> (J.F. Gmelin, 1788)	Shikra
2	Accipitridae	<i>Gyps bengalensis</i> (J.F. Gmelin, 1788)	White-rumped Vulture
3	Accipitridae	<i>Pernis ptilorhynchus</i> (Temminck, 1821)	Oriental Honey Buzzard
4	Accipitridae	<i>Spilornis cheela</i> (Latham, 1790)	Crested Serpent Eagle
5	Aegithinidae	<i>Aegithina tiphia</i> (Linnaeus, 1758)	Common Iora
6	Alcedinidae	<i>Alcedo atthis</i> (Linnaeus, 1758)	Common Kingfisher
7	Alcedinidae	<i>Halcyon smyrnensis</i> (Linnaeus, 1758)	White-throated Kingfisher
8	Anatidae	<i>Dendrocygna javanica</i> (Horsfield, 1821)	Lesser Whistling Duck
9	Ardeidae	<i>Ardeola grayii</i> (Sykes, 1832)	Indian Pond Heron
10	Ardeidae	<i>Bubulcus ibis</i> (Linnaeus, 1758)	Cattle Egret
11	Ardeidae	<i>Egretta garzetta</i> (Linnaeus, 1766)	Little Egret
12	Ardeidae	<i>Ixobrychus cinnamomeus</i> (J.F. Gmelin, 1789)	Cinnamon Bittern
13	Ardeidae	<i>Nycticorax nycticorax</i> (Linnaeus, 1758)	Black-crowned Night Heron
14	Artamidae	<i>Artamus fuscus</i> Vieillot, 1817	Ashy Woodswallow
15	Bucerotidae	<i>Anthracoceros albirostris</i> (Shaw, 1808)	Oriental Pied Hornbill
16	Bucerotidae	<i>Ocyrceros birostris</i> (Scopoli, 1786)	Indian Grey Hornbill
17	Campephagidae	<i>Pericrocotus</i> sp.	Minivet
18	Charadriidae	<i>Charadrius dubius</i> Scopoli, 1786	Little Ringed Plover

19	<b>Chloropseidae</b>	<i>Chloropsis aurifrons</i> (Temminck, 1829)	Golden-fronted Leafbird
20	<b>Ciconiidae</b>	<i>Leptoptilos javanicus</i> (Horsfield, 1821)	Lesser Adjutant
21	<b>Cisticolidae</b>	<i>Orthotomus sutorius</i> (Pennant, 1769)	Common Tailorbird
22	<b>Columbidae</b>	<i>Columba livia</i> J.F. Gmelin, 1789	Rock Dove
23	<b>Columbidae</b>	<i>Ducula aenea</i> (Linnaeus, 1766)	Green Imperial Pigeon
24	<b>Columbidae</b>	<i>Spilopelia chinensis</i>	Spotted Dove
25	<b>Columbidae</b>	<i>Streptopelia decaocto</i> (Frivaldszky, 1838)	Eurasian Collared Dove
26	<b>Columbidae</b>	<i>Streptopelia tranquebarica</i> (Hermann, 1804)	Red Collared Dove
27	<b>Corvidae</b>	<i>Corvus macrorhynchos</i> Wagler, 1827	Large-billed Crow
28	<b>Corvidae</b>	<i>Corvus splendens</i> Vieillot, 1817	House Crow
29	<b>Corvidae</b>	<i>Dendrocitta vagabunda</i> (Latham, 1790)	Rufous Treepie
30	<b>Cuculidae</b>	<i>Centropus sinensis</i> (Stephens, 1815)	Greater Coucal
31	<b>Cuculidae</b>	<i>Cuculus canorus</i> Linnaeus, 1758	Common Cuckoo
32	<b>Cuculidae</b>	<i>Eudynamys scolopaceus</i> (Linnaeus, 1758)	Asian Koel
33	<b>Cuculidae</b>	<i>Hierococcyx varius</i> (Vahl, 1797)	Common Hawk Cuckoo
34	<b>Cuculidae</b>	<i>Phaenicophaeus tristis</i> (Lesson, 1830)	Green-billed Malkoha
35	<b>Dicruridae</b>	<i>Dicrurus macrocercus</i> Vieillot, 1817	Black Drongo
36	<b>Dicruridae</b>	<i>Dicrurus paradiseus</i> (Linnaeus, 1766)	Greater Racket-tailed Drongo
37	<b>Estrildidae</b>	<i>Lonchura punctulata</i> (Linnaeus, 1758)	Scaly-breasted Munia
38	<b>Falconidae</b>	<i>Falco tinnunculus</i> Linnaeus, 1758	Common Kestrel
39	<b>Laniidae</b>	<i>Lanius cristatus</i> Linnaeus, 1758	Brown Shrike
40	<b>Laniidae</b>	<i>Lanius tephronotus</i> (Vigors, 1831)	Grey-backed Shrike
41	<b>Megalaimidae</b>	<i>Psilopogon asiaticus</i> (Latham, 1790)	Blue-throated Barbet
42	<b>Megalaimidae</b>	<i>Psilopogon haemacephalus</i> (Statius Muller, 1776)	Coppersmith Barbet
43	<b>Megalaimidae</b>	<i>Psilopogon lineatus</i> (Vieillot, 1816)	Lineated Barbet
44	<b>Meropidae</b>	<i>Merops leschenaulti</i> Vieillot, 1817	Chestnut-headed Bee-eater
45	<b>Meropidae</b>	<i>Merops orientalis</i> Latham, 1801	Green Bee-eater
46	<b>Monarchidae</b>	<i>Terpsiphone paradisi</i> (Linnaeus, 1758)	Indian Paradise-flycatcher

47	<b>Motacillidae</b>	<i>Anthus hodgsoni</i> Richmond, 1907	Olive-backed Pipit
48	<b>Motacillidae</b>	<i>Motacilla alba</i> Linnaeus, 1758	White Wagtail
49	<b>Muscicapidae</b>	<i>Copsychus saularis</i> (Linnaeus, 1758)	Oriental Magpie Robin
50	<b>Muscicapidae</b>	<i>Myophonus caeruleus</i> (Scopoli, 1786)	Blue Whistling Thrush
51	<b>Nectariniidae</b>	<i>Cinnyris asiaticus</i> (Latham, 1790)	Purple Sunbird
52	<b>Oriolidae</b>	<i>Oriolus xanthornus</i> (Linnaeus, 1758)	Black-hooded Oriole
53	<b>Paridae</b>	<i>Parus cinereus</i> Vieillot, 1818	Cinereous Tit
54	<b>Paridae</b>	<i>Passer domesticus</i> (Linnaeus, 1758)	House Sparrow
55	<b>Phalacrocoracidae</b>	<i>Microcarbo niger</i> (Vieillot, 1817)	Little Cormorant
56	<b>Phasianidae</b>	<i>Pavo cristatus</i> Linnaeus, 1758	Indian Peafowl
57	<b>Picidae</b>	<i>Dendrocopos macei</i> (Vieillot, 1818)	Fulvous-breasted Pied Woodpecker
58	<b>Picidae</b>	<i>Dinopium benghalense</i> (Linnaeus, 1758)	Lesser Golden-backed Woodpecker
59	<b>Picidae</b>	<i>Jynx torquilla</i> Linnaeus, 1758	Eurasian Wryneck
60	<b>Psittaculidae</b>	<i>Psittacula alexandri</i> (Linnaeus, 1758)	Red-breasted Parakeet
61	<b>Psittaculidae</b>	<i>Psittacula eupatria</i> (Linnaeus, 1766)	Alexandrine Parakeet
62	<b>Psittaculidae</b>	<i>Psittacula krameri</i> (Scopoli, 1769)	Rose-ringed Parakeet
63	<b>Pycnonotidae</b>	<i>Pycnonotus cafer</i> (Linnaeus, 1766)	Red-vented Bulbul
64	<b>Pycnonotidae</b>	<i>Pycnonotus jocosus</i> (Linnaeus, 1758)	Red-whiskered Bulbul
65	<b>Rallidae</b>	<i>Amaurornis phoenicurus</i> (Pennant, 1769)	White-breasted Waterhen
66	<b>Rhipiduridae</b>	<i>Rhipidura</i> sp.	White-throated Fantail
67	<b>Stenostiridae</b>	<i>Culicicapa ceylonensis</i> (Swainson, 1820)	Grey-headed Canary-flycatcher]
68	<b>Strigidae</b>	<i>Athene brama</i> (Temminck, 1821)	Spotted Owlet
69	<b>Strigidae</b>	<i>Glaucidium cuculoides</i> (Vigors, 1831)	Asian Barred Owlet
70	<b>Strigidae</b>	<i>Glaucidium radiatum</i> (Tickell, 1833)	Jungle Owlet
71	<b>Strigidae</b>	<i>Ninox scutulata</i> (Raffles, 1822)	Brown Hawk Owl
72	<b>Sturnidae</b>	<i>Acridotheres fuscus</i> (Wagler, 1827)	Jungle Myna
73	<b>Sturnidae</b>	<i>Acridotheres grandis</i> F. Moore, 1858	Great Myna
74	<b>Sturnidae</b>	<i>Acridotheres tristis</i> (Linnaeus, 1766)	Common Myna
75	<b>Sturnidae</b>	<i>Gracula religiosa</i> Linnaeus, 1758	Common Hill Myna



76	<b>Sturnidae</b>	Gracupica contra (Linnaeus, 1758)	Asian Pied Starling
77	<b>Sturnidae</b>	Sturnia malabarica (J.F. Gmelin, 1789)	Chestnut-tailed Starling
78	<b>Threskiornithidae</b>	Pseudibis papillosa (Temminck, 1824)	Indian Black Ibis
79	<b>Tytonidae</b>	Tyto alba (Scopoli, 1769)	Common Barn Owl

**Table 8: Checklist of dragonflies and damselflies of the campus**

Species name	Species name
<b>Suborder Anisoptera Seyles, 1854</b>	Orthetrum luzonicum (Brauer, 1868)
<b>Aeshnidae</b>	Orthetrum pruinosum (Burmeister, 1839)
Anaciaeschna jaspidea (Burmeister, 1839)	Orthetrum sabina (Drury, 1770)
Anax guttatus (Burmeister, 1839)	Palpopleura sexmaculata (Fabricius, 1787)
Anax indicus Lieftinck, 1942	Pantala flavescens (Fabricius, 1798)
Gynacantha dravida Lieftinck, 1960	Potamarcha congener (Rambur, 1842)
Gynacantha khasiaca MacLachlan, 1896	Rhodothemis rufa (Rambur, 1842)
<b>Gomphidae</b>	Rhyothemis plutonia Selys, 1883
Ictinogomphus rapax (Rambur, 1842)	Rhyothemis variegata (Linnaeus, 1763)
Paragomphus lineatus (Selys, 1850)	Tholymis tillarga (Fabricius, 1798)
<b>Macromiidae</b>	Tremea basilaris (Palisot de Beauvois, 1805)
Epopthalmia sp.	Tremea limbata (Desjardins, 1832)
<b>Libellulidae</b>	Trithemis aurora (Burmeister, 1839)
Acisoma panorpoides Rambur, 1842	Trithemis festiva (Rambur, 1842)
Aethriamanta brevipennis (Rambur, 1842)	Trithemis pallidinervis (Kirby, 1889)
Agrionoptera insignis (Rambur, 1842)	Urothemis signata (Rambur, 1842)
Brachydiplax chalybea Brauer, 1868	Zyxomma petiolatum Rambur, 1842
Brachydiplax farinosa Krüger, 1902	<b>Suborder Zygoptera Seules, 1854</b>
Brachydiplax sobrina (Rambur, 1842)	<b>Calopterygidae</b>
Brachythemis contaminata (Fabricius, 1793)	Neurobasis chinensis (Linnaeus, 1758)
Bradinopyga geminata (Rambur, 1842)	<b>Chlorocyphidae</b>
Crocothemis servilia (Drury, 1770)	Libellago lineata (Burmeister, 1839)
Diplacodes nebulosa (Fabricius, 1793)	<b>Coenagrionidae</b>
Diplacodes trivialis (Rambur, 1842)	Aciagrion approximans (Selys, 1876)
Hydrobasileus croceus (Brauer, 1867)	Aciagrion pallidum Selys, 1891
Lathrecista asiatica (Fabricius, 1798)	Agriocnemis clauseni Fraser, 1922
Neurothemis fulvia (Drury, 1773)	Agriocnemis femina (Brauer, 1868)
Neurothemis intermedia (Rambur, 1842)	Agriocnemis kalinga Nair & Subramanian, 2014
Neurothemis tullia (Drury, 1773)	Agriocnemis lacteola Selys, 1877
Orthetrum chrysis (Selys, 1891)	Agriocnemis pygmaea (Rambur, 1842)

Orthetrum glaucum (Brauer, 1865)	Amphiallagma parvum (Selys, 1876)
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**NBU Herbarium:**

University of North Bengal herbarium (NBU) stores around 12000 herbarium specimens, including Angiosperm, Gymnosperm and Pteridophytes. The herbarium is initially established in 1991 by the department of Botany, University of North Bengal. Recently in April, 2019 the Herbarium is upgraded along with modern facilities and shifted to a new separate building for easy access of in-house and global users. The acronym of the herbaria is NBU and the herbarium specimens are arranged as per APG IV. The Herbarium also contains a well oriented seed and fruit collections brought from various wilderness of India by different researchers, an organized pollen bank in the form of permanent slides of various angiosperms collected from different part of Himalaya, sub-Himalaya and plains of various agro-climatic zones of India. The herbarium a part of global herbarium network by registering under index herboriarum ([Herbarium Details | University of North Bengal \(nybg.org\)](http://nybg.org)).





Black Drongo



Red-naped Ibis



Oriental Pied Hornbill



House Sparrow



White-breasted Waterhen



*Oriens* sp.



Black Kite



Cattle Egret



Cattle Egret



*Lagerstroemia speciosa*



*Bixa orientalis*



*Bixa monosperma*



*Camellia sinensis*



*Cuscuta campestris*



*Camellia sinensis*



*Cycas pectinata*



*Bambusa sp.*

## PLANTATION OF TREES LAST FIVE YEARS IN THE UNIVERSITY CAMPUS

2016-2017 : i) 25 nos. Fruits planted by the Law Students in the Law Deptt. Complex.  
ii) 30 nos. Fruits plants planted in “Aranya Saptaha”

2017-2018 : i) 20 nos. Fruits plants planted by the North Bengal University Alumni Association.  
ii) Garden Developed in front of the Auditorium (R.B. Manch)

2018-2019 : i) Developed the garden in front of the H.R.D.C.  
ii) 15 nos. Fruit plants planted by the Golden Jubilee Committee of the Dept. of Commerce.

2019-2020: i) 15 nos. Fruits and avenue trees planted in campus during “Aranya Saptaha”  
ii) 10 nos. Fruit plants planted by the NSS volunteers.  
iii) 4 nos. Medicinal tree planted in NBU Medicinal Plant Garden by Botany Department.

2020-2021: i) 25 nos. Fruits and avenue trees planted in campus during “Aranya Saptaha”  
ii) 20 nos. Fruit plants planted by the NSS volunteers by various units.  
iii) 5 nos. Medicinal tree planted in NBU Medicinal Plant Garden & Departmental premises by Botany Department.

2022-23: Aranya Saptaha: All the NSS units of University of North Bengal along with Panchanan Anuragi Mancha, NBU celebrated “Aranya Saptaha” from 14th to 20th July, 2022. On that auspicious occasion a tree plantation drive was organized in the main campus of University of North Bengal on 18th July, 2022. A total of 80 plant saplings were planted at the following places. i. Beside HRDC Guest House ii. Back side of Sociology Department iii. Boys’ Hostel roadside iv. Near VK Hostel A total of 685 individuals including 200 NSS volunteers were participated in this drive. Besides all NBU NSS officials, members of Panchanan Anuragi Mancha and around 400 students and scholars also participated in this drive to make it successful.

## RAIN WATER HERVASTING:

Two Large units of Water researver were installed within the NBU main campus to facilitate the rain water hervasting. One installed near Life science bulding and hervested water is used in fish biology laboratory under Depatment of Zoology. The second one was installed near the Health centre.. The hervested water of second researve is used in NBU medicinal plant Garden for watering of the plants.

## WASTE MANAGERMENTS:

### Waste Management

A. The Medical waste disposal is through an agency called Greenzon Bio Pvt. Ltd. The house hold waste has no proper disposal system.

B. The liquid waste is disposed through Drainage into the Magurmari River.

C. There is no proper disposal system for solid waste at present however collaboration with the Siliguri Municipal Corporation is being carried on for a better outcome.

The organic campus waste are mostly used as compost and mixed with campus forest, nad other waste areas. Huge leave litters were naturally decomposed and mixed with soil as humus. Regarding plantics, Polyethylene terephthalate (or poly(ethylene terephthalate), PET, PETE, or the obsolete PETP or PET-P), is the most common thermoplastic polymer resin of the polyester family and is used in fibres for clothing, containers for liquids and foods, and thermoforming for manufacturing, and in combination with glass fibre for engineering resins. PET is known to leach antimony trioxide and phthalates. Both of these are dangerous to health. While antimony may contribute to cancer development, skin problems, menstrual and pregnancy issues, phthalates are endocrine disruptors. PET is also known for being the source of a number of potential chemical contaminants, including endocrine disruptors such as Bisphenol A, which can cause reproductive disorders, cardiovascular problems and cancer, among other ill effects. PET Neutral Campus Drive was organized by all the volunteers of NSS Unit I of the University of North Bengal on 28/11/2022. A total of 116 volunteers of NSS Unit I of University of North Bengal were present and successfully conducted the drive. Of them 67 were males and 49 were female volunteers.

**BUDGET ALLOCATION TO KEEP CAMPUS “GREEN”**  
**NAME OF THE HEAD OF ACCOUNT: “CAMPUS MAINTENANCE & BEAUTIFICATION”**

Year	Amount
2014-2015	Rs. 9,32,000.00 (Rupees Nine Lakh Thirty Two Thousand Only)
2015-2016	Rs. 12,30,000.00 (Rupees Twelve Lakh Thirty Thousand Only)

2016-2017	Rs. 13,55,000.00 (Rupees Thirteen Lakh Five Thousand Only)
2017-2018	Rs. 18,65,000.00 (Rupees Eighteen Lakh Sixty Five Thousand Only)
2018-2019	Rs. 20,50,000.00 (Rupees Twenty Lakh Fifty Thousand Only)
2019-2020	Rs. 22,55,000.00 (Rupees Twenty Two Lakh Fifty Five Thousand Only)
2020-2021	Rs. 23,68,000.00 (Rupees Twenty Three Lakh sixty eight Thousand Only)

### **IRRIGATIONAL FACILITIES**

University Estate Department have different types pump sets. Moveable and immovable sets for watering purpose. Many places of growing plants are being watered manually.

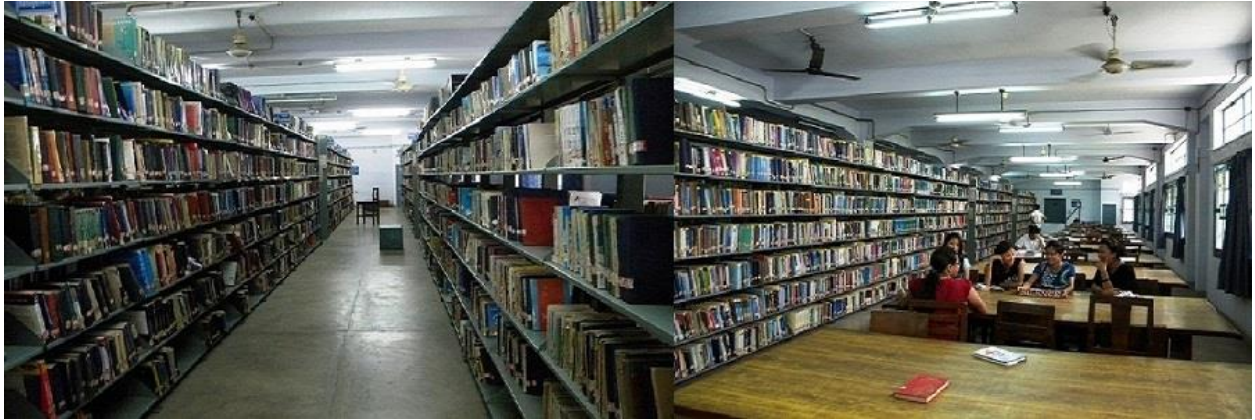


### External ambience of the Auditorium of the University



Internal ambience of Central library of the University with sufficient ventilation, and day light supplemented with lights and fans.





Circle garden in the road crossing



External ambience of the Gymnasium of the University



External ambience of Central library of the University



Circle garden in the road crossing.



COFAM, NBU



## **CONCLUSIONS:**

- The objectives of carrying out a green audit was to check the green practices followed by the university and to conduct a well-defined audit report to understand whether the university is on the track of sustainable development.
- University takes efforts to dispose of majority of waste by proper methods.
- Online computing i.e. Online payment systems, online circulars, etc. are helpful for reducing the use of papers and ultimately reducing carbon footprint.
- The sound levels on the campus are good. As most of the Departments are in different buildings spreaded throughout the the campus which is more than 300 acres. Although main Campus is near the high way but most of the buildings are more then 500 m away from the Highway. Pasdmaja Park snd Social forest areas cover the 500 m stretch which keeps the noise level at a significantly low level.
- 'Green Chemistry to reduce chemical waste' is followed in all the Science departments of University.
- Like many other Institutions development is an important aspect of University of North Bengal. This development by the University is always being achieved at the expense of environmental rehabilitation. This is to note with pride that University of North Bengal is an environment-friendly university. Several green development projects/ processes are in the pipeline to be adopted by the University.

## **Recommendations**

1. The ratio of covered space to open space seems to be satisfactory. However, university for any future expansion of covered space should plan for vertical rise after soil testing so that open space is not compromised.
2. Green spots should be planned, preferably on the basis of 3D modelling based on contour map. For maintenance of campus there is a scope of further mechanization.
3. Waste management policy is non-existent. A planned waste segregation, disposal and removal by ULB is necessary.
4. Gymnosperm and palm plants should be planted in the campus.
5. Irrigation facilities are needed to be modernized.
6. Water supply system needs through planning. The surface water drawn from wells is becoming insufficient and boring work by PHE is yet to become successful. Hence University should plan for wetland preservation and rainwater harvesting.

## **References and acknowledgement**

1. We acknowledge the help received from different Departments of the University of North Bengal.

2. Specially we acknowledge the help of Soil testing laboratory of Department of Tea science, NBU.
3. Special thanks are also due to Department of Botany, NBU herbarium and medicinal plants garden for listing of different plants.
4. Thanks are due to Weather station data from the Department of Geography.
5. We also thank Development officer of NBU for providing some information.
6. Partial help received from the previous 'Green audit report 2020-2021' is also greatly acknowledged.
7. Several photographs of NBU taken from different sources of University of North Bengal are also being acknowledged.

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