

GREEN CAMPUS

“A Green Campus is a cleaner, safer, and healthier place to live and work ¹”



REPORT

Prepared By

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A REPORT ON THE GREEN CAMPUS

Introduction

“Campus Greening” is a concept which stands for the efforts to establish environmentally sustainable practices in educational institutions. A green campus is a place where environmentally responsible practice and education go hand in hand and environmentally responsible tents are borne out by example. A green campus is one that carries out these functions according to a system-wide culture of environmental sustainability, balancing function and design with existing and foreseen resources” (1).

“Sustainability is a philosophy of life and a way of life that strives to enable everyone access to environmental, social and economic resources and yet defends the right of future generations. Its goal is to diminish the impact of ecological footprints by implementing the principles of sustainability at every level of institutional functioning” (2).

“In institution of higher learning, the seeds of change that are sown on the campus will grow and, ultimately disperse for a field. The green campus concept offers any institution the opportunity to take the lead in rethinking its environmental culture and developing new paradigms for solving problems that are local, national and global in nature” (1).

Greening the campus is about sweeping away wasteful inefficiencies and ushering in positive changes. Many of these changes address the daily, practical aspects of campus life-correct disposal, handling and storage of cleaning chemicals and materials associated with labs, purchase of environmentally friendly supplies and effective recycling programs.

Changes don't have happen all at once. They can be approached through a manageable, step-wise process. The primary requisites for a green campus are manifold. These are:

1. Management of hazardous materials
2. Waste management
3. Water quality, use and conservation
4. Improvement of air quality
5. Biodiversity conservation and management

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In the present scenario, Global warming is recognized as the most challenging issue coupled with the anthropogenic degradation of environment. In order to overcome the environmental degradation, there is a need to increase greenery in and around the residential/institutional/industrial area to reduce the greenhouse gases from the atmosphere. The IPCC (Intergovernmental Panel on Climate Change) special report on CO₂ capture and storage reported that the CO₂ capture and storage could be responsible for providing as much as 55% of emission reduction until 2010. Carbon Sequestration activities could play a pivotal role in the stabilization of these concentrations as required by the UNICEF (United Nation Framework Conventions on Climate Change) to which India is a signatory. In terms of atmospheric carbon reduction, plants offer a double benefit of direct carbon storage and stability of natural ecosystem with increased recycling of nutrients along with maintenance of climatic conditions.

In view of this, the present report on green campus focuses on the biodiversity, carbon storage and carbon sequestration at and around D.S.B. Campus, Kumaun University, Nainital.

An Overview of DSB Campus, Nainital

The D.S.B. Campus of Kumaun University, Nainital is situated in Ayarpatta range at an altitude of 2000m in Nainital town of Uttarakhand state. The campus covers an area of about 6.22 hectares (Table 1) and approximately 60% of which is covered with evergreen trees, dominated by *Quercus leucotrichophora*, *Cedrus deodara*, *Ficus nemoralis* etc. and deciduous trees such as, *Aesculus indica*, *Fraxinus micrantha* etc. (Map)

Table: 1. Land use pattern of D.S.B. Main Campus

S.No.	Category	Area in Hectare	% of Total Campus Area
1.	Forest Cover	2.35	37.8
2.	Woods and Land (Ground Vegetation)	1.45	23.3
3.	a. Built up area (Buildings, Office, Classrooms, Labs, Library and Hostels)	1.08	36.3
	b. Open land around buildings	1.18	
	Total	2.26	
4.	Covered Passages and Roads	0.16	2.6
Total		6.22	100



Map showing the area of D.S.B. Campus, Kumaun University, Nainital (Google Earth)

Biodiversity

Our campus is a rich repository of biodiversity. In general, a total of 44 tree species are growing either naturally grown or planted within the campus in yesteryears. Of these, 32 are angiosperms and 12 are gymnosperms. Besides, 49 shrub species, 106 herbs, 66 bryophytes and 28 pteridophytes are also growing under the canopy and the open spaces of the campus. Various ornamental plants are grown and maintained in the campus.

To maintain and increase the greenery of the campus, since last three years, Botany department has organised several plantation programmes, especially on the occasion of Environment Day (5th June) and on Van Mahotsava Week (1st of July). To organise these plantation programme nicely, PG and Research Scholars are encouraged to develop small nursery with the help of gardener of the department. At present, seedlings and saplings of *Quercus leucotrichophora* (Banj oak) *Trachycarpus takil* (Kumaun palm, an endemic species) and *Ginkgo biloba* (Maiden hair tree) is being prepared and maintained in the department. Seedlings of these plants are being planted during various functions organised in the department and campus. At the time of large scale plantation programmes in addition to the aforesaid plants, seedlings and saplings of several other plant species like *Aesculus indica*, *Rhododendron arboreum*, *Litsea umbrosa*, *Nerium indicum* are procured from the forest department. Each year about 50 plants of various species native to this locality are planted in campus and the hostels. The survival and establishment of the plantations are monitored periodically by the students, research scholars, teachers and staff of Botany Department.

Carbon Storage and Sequestration

The greenery in and around campus is significant because trees act as a major CO₂ sink by capturing carbon from the atmosphere and store them in the form of fixed biomass during the growth process. Therefore, basal area of a tree will provide information about the biomass and the carbon stock of the tree/forest. In a study, taken up by the PG students of the department revealed that mean basal area of trees ranged from 0.010 m² tree⁻¹ (*Prunus cerasoides*) to 0.580 m² tree⁻¹ (*Fraxinus micrantha*). These trees store 0.19 t tree⁻¹ to 2.44t tree⁻¹ biomass and 0.09 t tree⁻¹ to 1.22 t tree carbon stock. In general, total biomass of tree layer in DSB Campus is about 204.68 tha⁻¹ and total standing carbon stock is 102.34 t ha⁻¹. The total forested area of this campus is about 2.35 ha and calculated total **tree layer biomass** was approximately **482 tonne**. The total carbon stock of the trees is about **241 tonne**.

In view of the significance of the vegetation, growing trees in urban areas can be a potential source in reducing the concentration of CO₂ in atmosphere by its accumulation as biomass. About 80-90% forest composition of DSB and adjacent area is predominated by oak trees which have tremendous capacity to conserve water and nutrients in soil. The dense canopy also helps in reducing soil loss and rapid erosion of top soil. It has been estimated that these trees (oaks) have potential to sequester about 8-10 t carbon/ha/yr (**21 tonne carbon per year sequestration** for total forested area of the campus) from the atmosphere, thus mitigating CO₂ level in the atmosphere.

Future Prospects

Natural vegetation imparts greenery to the D.S.B. Campus to a large extent, however, at pockets, ornamentals provide colour to the landscape beyond green. At present 1.45 ha area is still available for future afforestation programme. Stepwise efforts are being made to develop the pockets of ornamentals/medicinal plants to attract the students, visitor's school children to acquaint the knowledge about the benefit of the plants and also to inculcate the habit of growing and protecting the plants in their homes and surroundings and not to cut the trees.

There is an urgent need to assess and calculate Ecological Foot Print (EFP) and Carbon Credit (CC) of the Campus in order to understand current ecological sustainability status and to demand money in terms of green bonus from the state government.

**A LIST OF DOCUMENTED PLANTS OF D.S.B. CAMPUS, KUMAUN
UNIVERSITY, NANITAL**

A. List of some common trees of D.S.B. Campus, Nainital

Angiosperms

1. *Acer caesium* Wall. ex Brandis
2. *Acer oblongum* Wall. ex DC.
3. *Aesculus indica* Wall. ex Cambess.
4. *Albizza mollis* Boiv.
5. *Alnus nepalensis* D. Don
6. *Betula alnoides* Buch.-Ham. ex D. Don
7. *Buxus wallichiana* Baill.
8. *Cornus macrophylla* Wall.
9. *Cornus oblongum* Wall.
10. *Erythrina arborescens* Roxb.
11. *Eucalyptus globulus* Labill.
12. *Euonymus tingens* Wall.
13. *Ficus neriifolia* var. *nemoralis* (Wall. ex Miq.) Corner
14. *Ficus palmata* Forssk.
15. *Fraxinus micrantha* Lingelsh.
16. *Grevillea robusta* A. Cunn. ex R. Br.
17. *Grewia optiva* J. R. Drumm. ex Burret
18. *Ilex dipyrrena* Wall.
19. *Juglans regia* Linn.
20. *Litsea umbrosa*
21. *Machilus duthiei* King ex Hook. f.
22. *Magnolia grandiflora* L.
23. *Platanus orientalis* L.
24. *Populus ciliata* Wall. ex Royle
25. *Prunus cerasoides* Buch.-Ham. ex D. Don
26. *Punica granatum* L.
27. *Pyrus communis* L.
28. *Quercus floribunda* Lindl. ex A. Camus
29. *Quercus leucotrichophora* A. Camus
30. *Rhus wallichii* Hook. f.
31. *Symplocos chinensis*
32. *Trachycarpus takil* Becc.

Gymnosperms

1. *Araucaria bidwillii* Hook.
2. *Biota orientalis* (L.) Endl.
3. *Cedrus deodara* (Roxb. ex D. Don) G. Don
4. *Cephalotaxus griffithii* Hook. f.
5. *Cupressus torulosa* D. Don
6. *Cycas revoluta* Thunb.
7. *Ginkgo biloba* L.
8. *Juniperus communis* L.
9. *Pinus roxburghii* Sarg.

10. *Pinus wallichiana* A.B. Jacks.
11. *Taxus wallichiana* Zucc.
12. *Zamia* sp.

B. List of some common shrub species of D.S.B. Campus, Nainital

1. *Berberis asiatica* Roxb. ex DC.
2. *Berberis chitria* Buch.-Ham. ex Lindl.
3. *Cannabis sativa* L.
4. *Caryopteris grata* (Wall. ex Walp.) Benth. & Hook.f. ex C.B. Clarke
5. *Colquhounia coccinea* Wall.
6. *Coriaria nepalensis* Wall.
7. *Cotoneaster microphyllus* Wall. ex Lindl.
8. *Cyathula tomentosa* (Roth) Moq.
9. *Daphne cannabina* Lour.
10. *Debregeasia longifolia* (Burm.f.) Wedd.
11. *Desmodium elegans* DC.
12. *Deutzia staminea* R.Br. ex Wall.
13. *Dicliptera bupleuroides* Nees
14. *Girardinia diversifolia* (Link) Friis
15. *Goldfussia dalhousiana* Nees
16. *Hydrangea macrophylla* (Thunb.) Ser.
17. *Hypericum oblongifolium* Choisy
18. *Indigofera dosua* D. Don
19. *Indigofera heterantha* Brandis
20. *Jasminum humile* L.
21. *Leycesteria formosa* Wall.
22. *Mahonia nepalensis* DC. ex Dippel
23. *Mirabilis jalapa* L.
24. *Opuntia vulgaris* Mill.
25. *Prinsepia utilis* Royle
26. *Pteracanthus alatus* (Nees) Bremek.
27. *Pyracantha crenulata* (Roxb. ex D. Don) M. Roem.
28. *Reinwardtia trigyna* Planch.
29. *Rhamnus triquetra* (Wall.) Brandis
30. *Rhamnus virgatus* Roxb.
31. *Ricinus communis* L.
32. *Rosa brunonii* Lindl.
33. *Rubus biflorus* Buch.-Ham. ex Sm.
34. *Rubus ellipticus* Sm.
35. *Rubus niveus* Thunb.
36. *Rubus paniculatus* Sm.
37. *Rumex hastatus* D. Don
38. *Salix elegans* Wall. ex Andersson
39. *Salvia leucantha* Cav.
40. *Sambucus nigra* L.
41. *Sarcococca saligna* Müll. Arg.
42. *Scutellaria angulosa* Benth.
43. *Sinoarundinaria falcata* (Nees) C.S. Chao & Renvoize
44. *Spiraea canescens* D. Don

45. *Spiraea corymbosa* Raf.
46. *Urtica parviflora* Roxb.
47. *Viburnum cotinifolium* D. Don
48. *Viburnum mullaha* Buch.-Ham. ex D. Don
49. *Zanthoxylum alatum* Roxb.

C. List of some common herb species of D.S.B. Campus, Nainital

1. *Achyranthes aspera* L.
2. *Achyranthes bidentata* Blume
3. *Ageratum conyzoides* (L.) L.
4. *Agrimonia pilosa* Ledeb.
5. *Ainsliaea aptera* DC.
6. *Ajuga parviflora* Benth.
7. *Anaphalis busua* (Buch.-Ham.) DC.
8. *Anaphalis contorta* (D. Don) Hook. f.
9. *Anemone vitifolia* Buch.-Ham. ex DC.
10. *Arisaema consanguineum* Schott
11. *Arisaema tortuosum* (Wall.) Schott
12. *Artemisia niligrlica*
13. *Arthraxon lanceolatus* (Roxb.) Hochst.
14. *Aster asperulus* (DC.) Wall. ex Hook. f.
15. *Aster thomsonii* C. B. Clarke
16. *Barleria cristata* L.
17. *Begonia picta* Sm.
18. *Berginia ciliata*
19. *Bidens biternata* (Lour.) Merr. & Sherff
20. *Bidens pilosa* L.
21. *Bulbostylis barbata* (Rottb.) C. B. Clarke
22. *Cardmine hirsuta* L.
23. *Carex condensata* Nees
24. *Carex cruciata* Wahlenb.
25. *Carex nubigena* D. Don ex Tilloch & Taylor
26. *Centella asiatica* (L.) Urb.
27. *Chirita bifolia* D. Don
28. *Chlorophytum tuberosum* (Roxb.) Baker
29. *Chrysopogon serrulatus* Trin.
30. *Circaea lutetiana* L.
31. *Cissampelos pareira* L.
32. *Conyza japonica* (Thunb.) Less. ex Less.
33. *Craniotome versicolor* Rchb.
34. *Crotalaria sessiliflora* L.
35. *Curculigo orchioides* Gaertn.
36. *Cynodon dactylon* (L.) Pers.
37. *Cynoglossum lanceolatum* Forssk.
38. *Cyperus difformis* L.
39. *Cyperus paniceus* (Rottb.) Boeckeler
40. *Cyperus triceps* Endl.
41. *Desmodium parvifolium* DC.
42. *Didymocarpus pedicellatus* R. Br.

43. *Dioscorea biformifolia* S.J.Pei & C.T.Ting
44. *Dioscorea bulbifera* L.
45. *Elephantopus scaber* L.
46. *Emilia sonchifolia* (L.) DC. ex Wight
47. *Epilobium royleanum* Hausskn.
48. *Epipactis latifolia* (L.) All.
49. *Erigeron bonariensis* L.
50. *Erigeron karvinskianus* DC.
51. *Erigeron multiradiatus* (Lindl. ex DC.) Benth. ex C.B.Clarke
52. *Fragaria indica* Wall.
53. *Galinsoga ciliata* (Raf.) S.F.Blake
54. *Galinsoga parviflora* Cav.
55. *Geranium nepalense* Sweet
56. *Geranium wallichianum* D.Don ex Sweet
57. *Gerbera gossypina* (Royle) Beauverd
58. *Gonatanthus pumilus* (D.Don) Engl. & K.Krause
59. *Hedychium spicatum* Sm.
60. *Hydrocotyle javanica* Thunb.
61. *Hypoxis aurea* Lour.
62. *Impatiens balsamina* L.
63. *Justicia simplex* D.Don
64. *Leucas mollissima* Wall. ex Benth.
65. *Lindernia anagallis* (Burm.f.) Pennell
66. *Melissa flava* Benth.
67. *Micromeria biflora* (Buch.-Ham. ex D.Don) Benth.
68. *Microsytlis wallichii* Lindl.
69. *Neanotis calycina* (Wall. ex Hook.f.) W.H.Lewis
70. *Oenothera rosea* L'Hér. ex Aiton
71. *Oxalis corniculata* L.
72. *Oxalis corymbosa* DC.
73. *Oxalis latifolia* Kunth
74. *Paspalum paspalodes* (Michx.) Scribn.
75. *Poa pratensis* L.
76. *Polygonum capitatum* Buch.-Ham. ex D.Don
77. *Polygonum hydropiper* L.
78. *Polygonum nepalense* Meisn.
79. *Potentilla nepalensis* D.Don
80. *Pouzolzia hirta* Blume ex Hassk.
81. *Roscoea purpurea* Sm.
82. *Rubia cordifolia* L.
83. *Rumex hastatus* D.Don
84. *Rungia pectinata* (L.) Nees
85. *Scutellaria angulosa* Benth.
86. *Setaria glauca* (L.) P.Beauv.
87. *Setaria homonyma* (Steud.) Chiov.
88. *Smilax macrophylla* Roxb.
89. *Smithia ciliata* Royle
90. *Solidago virgaurea* L.
91. *Stachys sericea* Cav.
92. *Swertia ciliata* (D. Don ex G. Don) B.L. Burtt

93. *Synotis rufinervis* (DC.) C.Jeffrey & Y.L.Chen
94. *Teucrium royleanum* Wall. ex Benth.
95. *Thalictrum foliolosum* DC.
96. *Themeda anathera* (F.Muell.) T.Durand & B.D.Jacks.
97. *Torenia cordifolia* Roxb.
98. *Torilis japonica* (Houtt.) DC.
99. *Trifolium repens* L.
100. *Typhonium diversifolium* Wall. ex Schott
101. *Valeriana wallichii* DC.
102. *Vinca rosea* L.
103. *Viola pilosa* Blume
104. *Vitis himalayana* (Royle) Brandis
105. *Wedelia wallichii* Less.
106. *Wulfenia amherstiana* Benth.

D. List of some common Bryophytes species of D.S.B. Campus, Nainital

Liverworts

1. *Asterella pathankotensis* (Kashyap) Verd.
2. *Asterella wallichiana* (Lehm.) Grolle
3. *Cryptomitrium himalayense* Kashyap
4. *Cyathodium tuberculatum* Udar & D.K. Singh
5. *Dumortiera hirsuta* (Sw.) Nees
6. *Lunularia cruciata* (L.) Dumort. ex Lindb.
7. *Plagiochasma appendiculatum* Lehm. & Lindenb.
8. *Porella acutifolia* (Lehm. & Lindenb.) Trevis.
9. *Stephensiella brevipedunculata* Kashyap
10. *Targionia hypophylla* L.

Hornworts

1. *Anthoceros* sp.
2. *Notothylas* sp.

Leafy Liverworts

1. *Fossombronia himalayensis* Kashyap
2. *Frullania muscicola* Stephani
3. *Lejeunea* sp.

Mosses

1. *Anomodon rugelii* (C. Muell.) Keissl.
2. *Barbula flavescens* (Hook. & Grev.) Brid.
3. *Brachymerium capitulatum* (Mitt.) Par.
4. *Brachythecium buchanani* (Hook.) Jaeg.
5. *Bryoerythrophyllum dentatum* (Mitt.) P.C. Chen

6. *Bryoerythrophyllum gymnostomum* (Broth.) Chen
7. *Bryum argenteum* Hedw.
8. *Bryum bicolor* Dicks.
9. *Bryum caespiticium* L. ex Hedw.
10. *Bryum capillare* L. ex Hedw.
11. *Bryum plumosum* Doz. & Molk.
12. *Caduciella mariei* (Besch.) Enroth
13. *Conomitrium subpalmatum* (C. Muell.) Jaeg.
14. *Cryptoleptodon flexuosus* (Harv.) Ren. & Card.
15. *Cylindrothecium laetum* (Griff.) Paris
16. *Cylindrothecium myurum* (Hook.) Paris
17. *Desmatodon gemmascens* Chen
18. *Didymodon mittenii* Gangulee
19. *Didymodon recurvus* (Griff.) Broth.
20. *Ditrichum ambiguum* Best
21. *Ditrichum heteromallum* (Hedw.) Britt.
22. *Ectropothecium cyperoides* (Hook.) Jaeg.
23. *Entodon chloropus* Renauld & Cardot
24. *Entodon plicatus* C. Muell.
25. *Entodon propens* (Mitt.) Jaeg.
26. *Entodon rubicundus* (Mitt.) Jaeg.
27. *Fabronia pusilla* Raddi
28. *Fabronia schensiana* C. Muell.
29. *Fissidens sylvaticus* Griff.
30. *Funaria hygrometrica* Hedw.
31. *Herpetineuron toccoae* (Sull. & Lesq.) Card.
32. *Homaliodendron microdendron* (Mont.) Fleisch.
33. *Homalothecium neckeroides* (Griff.) Par.
34. *Hydrogonium amplexifolium* (Mitt.) Chen.
35. *Hymenostylium recurvirostrum* (Hedw.) Dixon
36. *Hyophila involuta* (Hook.) A. Jaeger
37. *Hypnum cupressiforme* Hedw.
38. *Leucodon secundus* (Harv.) Mitt.
39. *Levierella fabroniacea* C. Muell.
40. *Lindbergia koelzii* R.S. Williams
41. *Physcomitrium pyriforme* (Hedw.) Hamp.
42. *Plagiomnium integrum* (Bosch & Lac.) Kop.
43. *Plagiothecium denticulatum* (Hedw.) B.S.G.
44. *Plagiothecium neckeroideum* B.S.G.
45. *Regmatodon orthostegius* Mont.
46. *Rhynchostegiella menadensis* (Lac.) Bartr.
47. *Rhyncostegium vagans* Jaeg.
48. *Stereophyllum fulvum* (Harv.) Jaeg.
49. *Timmiella anomala* (B.S.G.) Limpr.

50. *Tortula spathulata* (Harv.) Mitt.
51. *Trachypodopsis serrulata* (P. Beauv.) Fleisch.

E. List of some common Pteridophyte species of D.S.B. Campus, Nainital

Fern and Fern-Allies

1. *Adiantum incisum* Forssk.
2. *Anogramma leptophylla* (L.) Link
3. *Araiostegia hookeri* (T. Moore ex Bedd.) Ching
4. *Araiostegia pulchra* (D. Don) Copel.
5. *Asplenium adiantum-nigrum* L.
6. *Asplenium varians* Wall. ex Hook. & Grev.
7. *Athyrium foliolosum* T. Moore ex R. Sim
8. *Athyrium rupicola* (Edgew. ex C. Hope) C. Chr.
9. *Botrychium lanuginosum* Wall. ex Hook. & Grev.
10. *Cheilanthes albomarginata* C.B. Clarke
11. *Cheilanthes anceps* Blanf.
12. *Cheilanthes dalhousiae* Hook.
13. *Christella dentata* (Forssk.) Brownsey & Jermy
14. *Diplazium frondosum* C. Chr.
15. *Drynaria mollis* Bedd.
16. *Goniophlebium argutum* (Wall. ex Hook.) J. Sm. ex Hook.
17. *Lepisorus* sp.
18. *Microsorium membranaceum* (D. Don) Ching
19. *Nephrolepis auriculata* Trimen
20. *Onychium contiguum* C. Hope
21. *Polypodiodes lachnopus* (Wall. ex Hook.) Ching
22. *Polypodiodes microrhizoma* (C.B. Clarke ex Baker) Ching
23. *Polystichum squarrosum* (D. Don) Fée
24. *Pteris cretica* L.
25. *Pteris quadriaurita* Retz.
26. *Pteris vittata* L.
27. *Selaginella chrysocaulos* (Hook. & Grev.) Spring
28. *Vittaria flexuosa* Fee

F. List of some common Fungi and Lichens of DSB Campus, Nainital

Fungi:

1. *Achlya flagellata* Coker
2. *Agaricus bispora* Singer
3. *Albugo candida* Liv.
4. *Alternaria alternata* (Fr.) Keissler
5. *Fomes fomentarius* (L.Fr.) Kickx.
6. *Ganoderma colossum* (Fr.) Bres.

7. *Lenzites betulina* (Fr.) Fr.
8. *Lunulospora curvula* Ingold
9. *Lycoperdon nainitalensis* Thind & Thind
10. *Merulius tremellosus* Mont.
11. *Morchella esculenta* (L.fr.) Pers.
12. *Pezziza vesiculosa* Kort.
13. *Phellinus allardii* Quelet
14. *Polyporus dichrous* Berk.
15. *Puccinia graminis* Erik & Hann.
16. *Pythium debaryanum* Hesseltine
17. *Saprolegnia diclina* Mumphrey
18. *Tetracladium nainitalensis* Sati et. al.
19. *Tricladium indicum* Sati & Tewari
20. *Xylaria polymorpha* Grev.

Lichens:

1. *Anaptychia formula* Nyl.
2. *Anaptychia hypoleuca* Muhlbg. Wainio
3. *Anaptychia speciosa* (Wulf.) Wainio
4. *Anthracotheceum variolosum* Mull. Arg.
5. *Cladonia pityrea* Fr.
6. *Collema flaccidum* Degal
7. *Dermatocarpon vellereum* Zscha
8. *Graphina acharii* Mul. Arg.
9. *Heterodermia himalayana* Awasthi
10. *Lecania caesia* A.L. Sm.
11. *Lecidia subkochiana* Cromb.
12. *Leptogium pedicilatum* P.M.Jorg.
13. *Lobaria pulmonaria* Hoffm.
14. *Parmelia alpicola* Th. Fr.
15. *Parmelia cristifera* Tayl.
16. *Parmelia latissima* Hoe.
17. *Phaeophyscia hispidula* Awas. et S.R.Singh
18. *Physcia dilatata* Awasthi
19. *Physcia stellaris* Nyl.
20. *Placodium tetrastichium* A.L. Sm.
21. *Placodium vitellinulum* Th. Fr.
22. *Ramalina farinacea* (L.) Ach.
23. *Usnea orientalis* Motyka

Plantation on 7 July 2014

1. *Acer pictum* Thunb.
2. *Aesculus indica* (Wall. ex Cambess.) Hook.
3. *Biota orientalis* (L.) Endl.
4. *Cotoneaster microphyllus* Wall. ex Lindl.
5. *Ficus nerifolia* var. *nemoralis* (Wall. ex Miq.) Corner

6. *Ginkgo biloba* L.
7. *Myrica esculenta* Buch.-Ham. ex D. Don
8. *Nerium indicum* Mill.
9. *Platanus orientalis* L.
10. *Q. floribunda* Lindl. ex A. Camus
11. *Q. leucotrichophora* A. Camus
12. *Trachycarpus takil* Becc.
13. *Zanthoxylum* sp.

Ornamentals:

1. *Antirrhinum majus* L.
2. *Bellis perennis* L.
3. *Calendula* L.
4. *Cestrum nocturnum* L.
5. *Chrysanthemum* spp.
6. *Dianthus caryophyllus* L.
7. *Forsythea viridissima* L.
8. *Hydrangea macrophylla* (Thunb.) Ser.
9. *Jasminum humile* L.
10. *Lilium candidum* L.
11. *Meizotropis pellita* (Wall. ex Hook. f. & Grev.)
12. *Musa paradisiaca* L.
13. *Pelargonium abrotanifolium* Jacq.
14. *Rosa* L.
15. *Salvia officinalis* L.
16. *Tagetes erecta* L.
17. *Wisteria chinensis* L.
18. *Zamia* L.

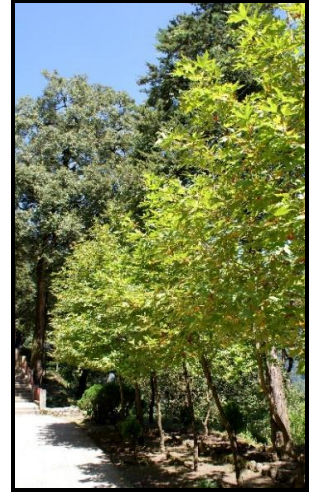
TREES



Quercus leucotrichophora



Magnolia grandiflora



Platanus orientalis



Acer oblongum



Alnus nepalensis



Ilex dipyrena



Aesculus indica

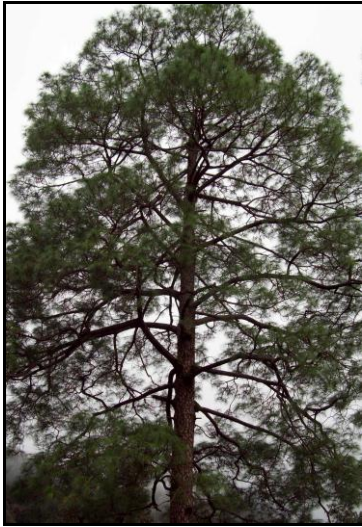


Eucalyptus globulus

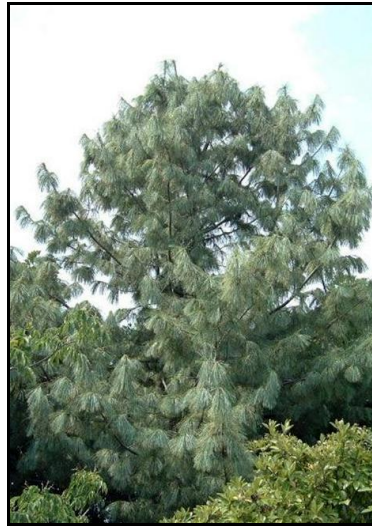


Trachycarpus takil

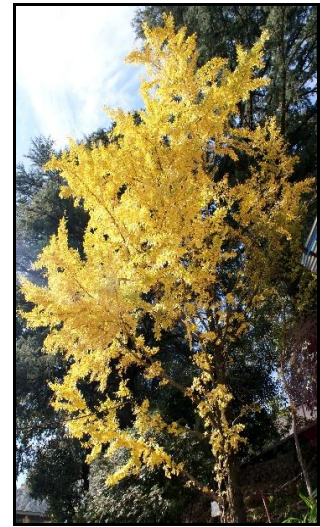
GYMNOSPERMS



Pinus roxburghii



Pinus wallichiana



Ginkgo biloba



Cupressus torulosa



Cycas revoluta



Taxus wallichiana



Cephalotaxus griffithii



Zamia sp.

HERBS



Oenothera rosea



Erigeron boneriensis



Achyranthes bidentata



Geranium nepalense



Arisaema tortuosum



Cynoglossum glochidiatum



Impatiens balsamina



Hedychium spicatum



Thalictrum foliolosum



Galinsoga parviflora



Theropogon pallidus



Oxalis corniculata



Polygonum capitatum



Cymbalaria muralis



Calamintha umbrosa



Vitis himalayana



Indigofera heterantha



Leptadenia reticulata



Pimpinella sp.



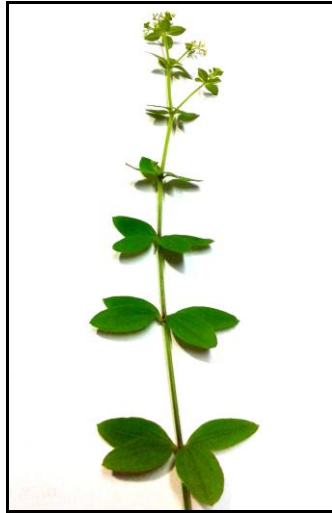
Commelina benghalensis



Solanum nigrum



Cirsium argeracanthus



Rubia cordifolia



Pilea scripta



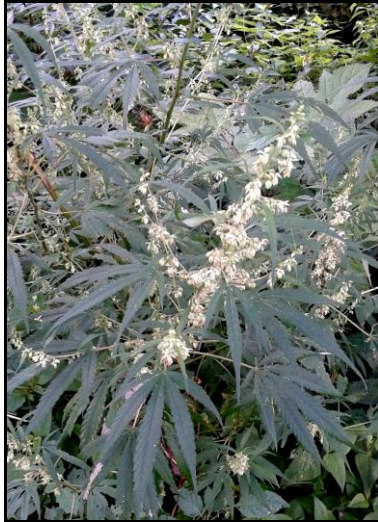
Heracleum candicans



Plantago major



Erigeron karvinkianus



Cannabis sativa



Mirabilis jalapa



Bromus unioloides



Geranium nepalense



Camelia sinensis



Nicranda physioloides



Gerardinia heterophylla



Urtica dioica



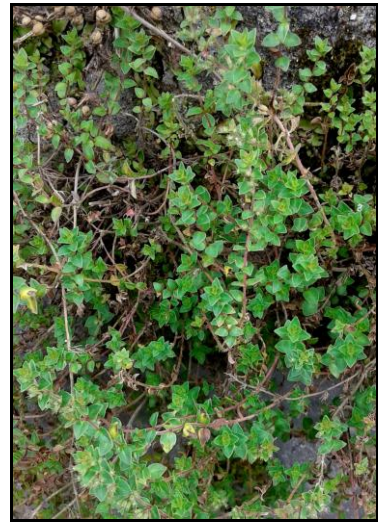
Artemisia nilagirica



Musa paradisiaca



Campanula cana



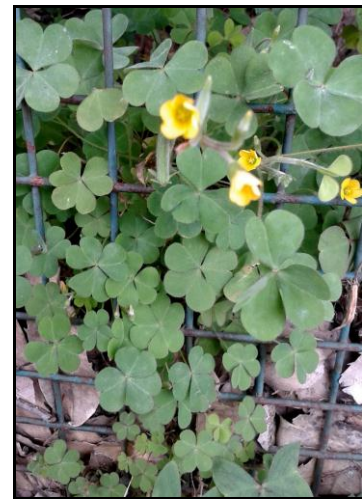
Micromeria biflora



Boenninghausenia albiflora



Vitis himalayana



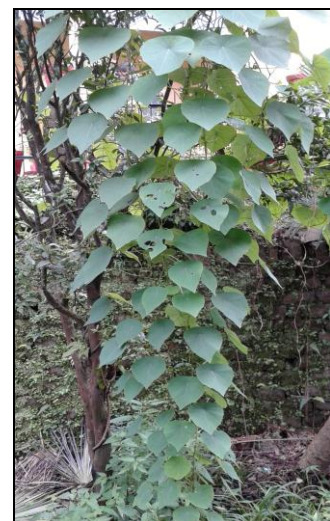
Oxalis corniculata



Rumex hastatus



Lindenbergia indica



Stephania glabra

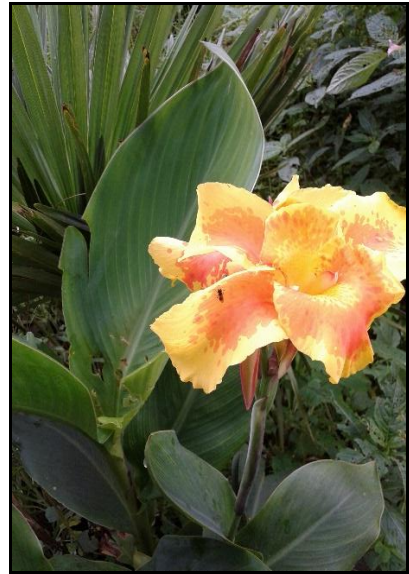
ORNAMENTALS



Meizopteris pellita



Hydrangia macrophylla



Canna indica



Crinum asiaticum



Tagetes erecta



Rosa sp.



Chrysanthemum sp.



Bellis perennis



Hemerocallis littoralis

BRYOPHYTES



Stephensiella brevipendunculata



Marchantia paleacea



Plagiochasma appendiculatum



Cyathodium tuberculatum



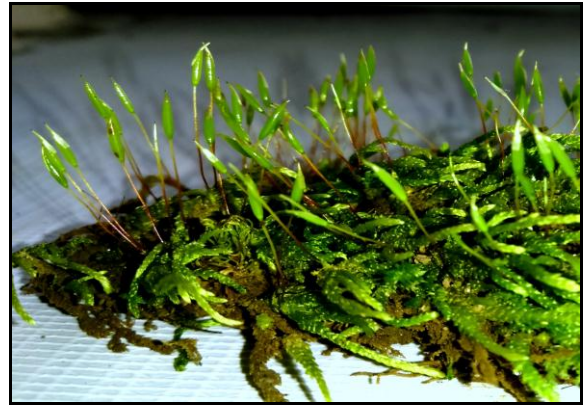
Targionia hypophylla



Asterella pathankotensis



Mnium cuspidatum



Entodon laetus



Bryum caespiticium



Porella densifolia



Rhodobryum roseum

PTERIDOPHYTES



Araiostegia pulchra



Botrychum lanuginosum



Polypodiodes lachnopus



Selaginella chrysocaulis

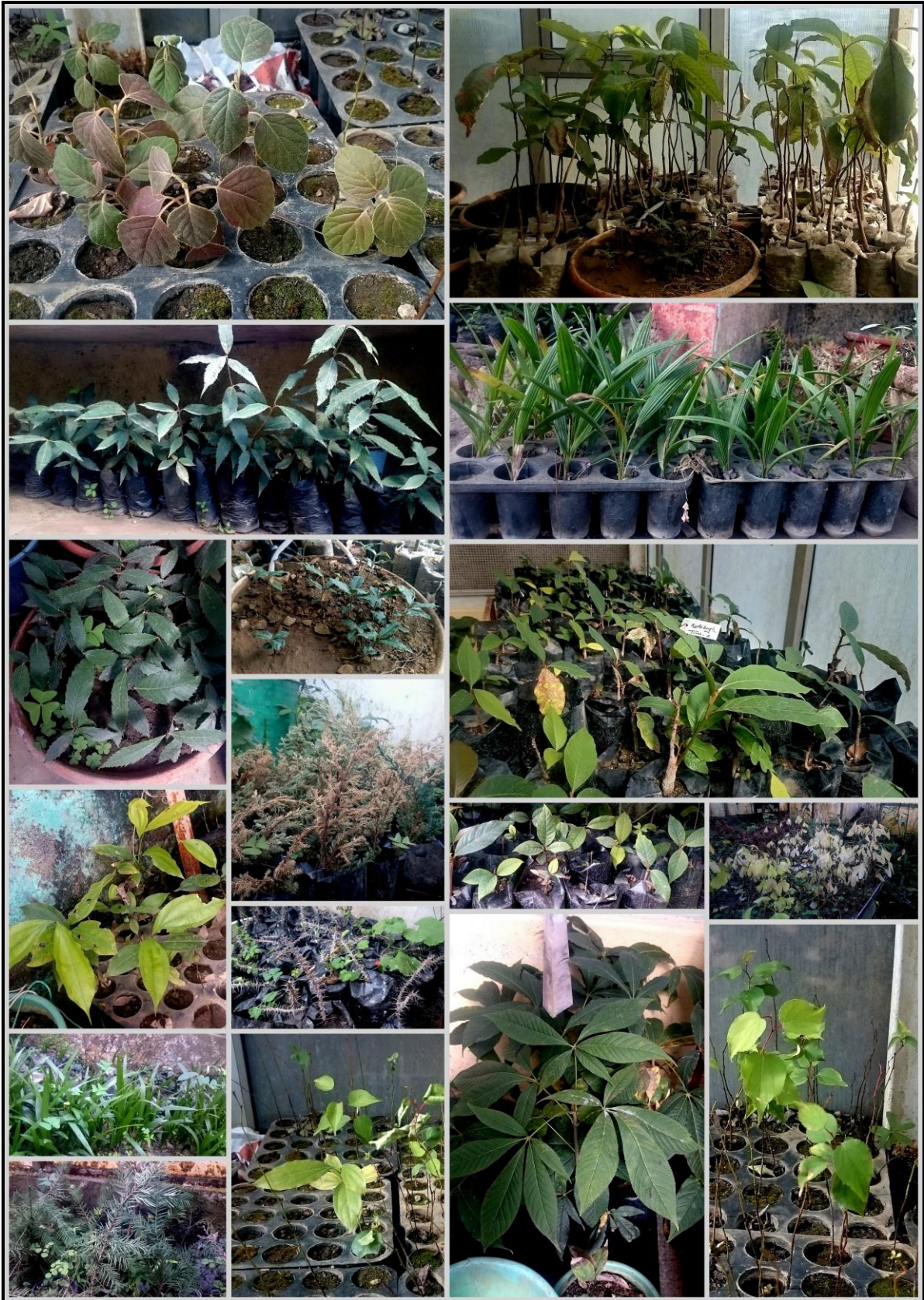


Asplenium unilaterale

Fruiting Bodies of Some Common Fungi



NURSERY



PLANTATION PROGRAMME



References

1. EPA Region 1 College and University Web page:
<http://www.epa.gov/region01/steward/univ/index.html> (Greening the Campus...
Where Practice and Education Go Hand in Hand)
2. <http://www.smkb.ac.il/en/green-campus/campus-greening>
3. Map from Google Earth.

Acknowledgement

It is a great pleasure to record gratitude to Prof. Y.P.S. Pangtey (NASI Fellow, Department of Botany, D.S.B. Campus, Nainital) for identification, confirmation and suggestions for the preparation of this report. We are also grateful to our colleagues who contributed in various ways and suggested a number of improvements during the preparation of the report. We especially thank Prof. P.C. Pande for helping us in the identification of plants. I would thank Prof. G.L.Shah (Retd.), Department of Geography, D.S.B. Campus, Nainital for providing data on land use pattern of D.S.B. Campus, Kumaun University, Nainital. Thanks are also due to the research scholars, Mr. Ravinder Bargali (Listing, Editing and Typing), Mr. Rajendra Singh Parihaar, Ms Bhawana Kapkoti, Ms Nidhi Bhakuni, Ms Richa Pathak, Ms. Samta Sharma (Carbon Sequestration data) Mr. Brij Mohan Upreti (Photographs of Plantation Programmes) for compiling the list of plants.