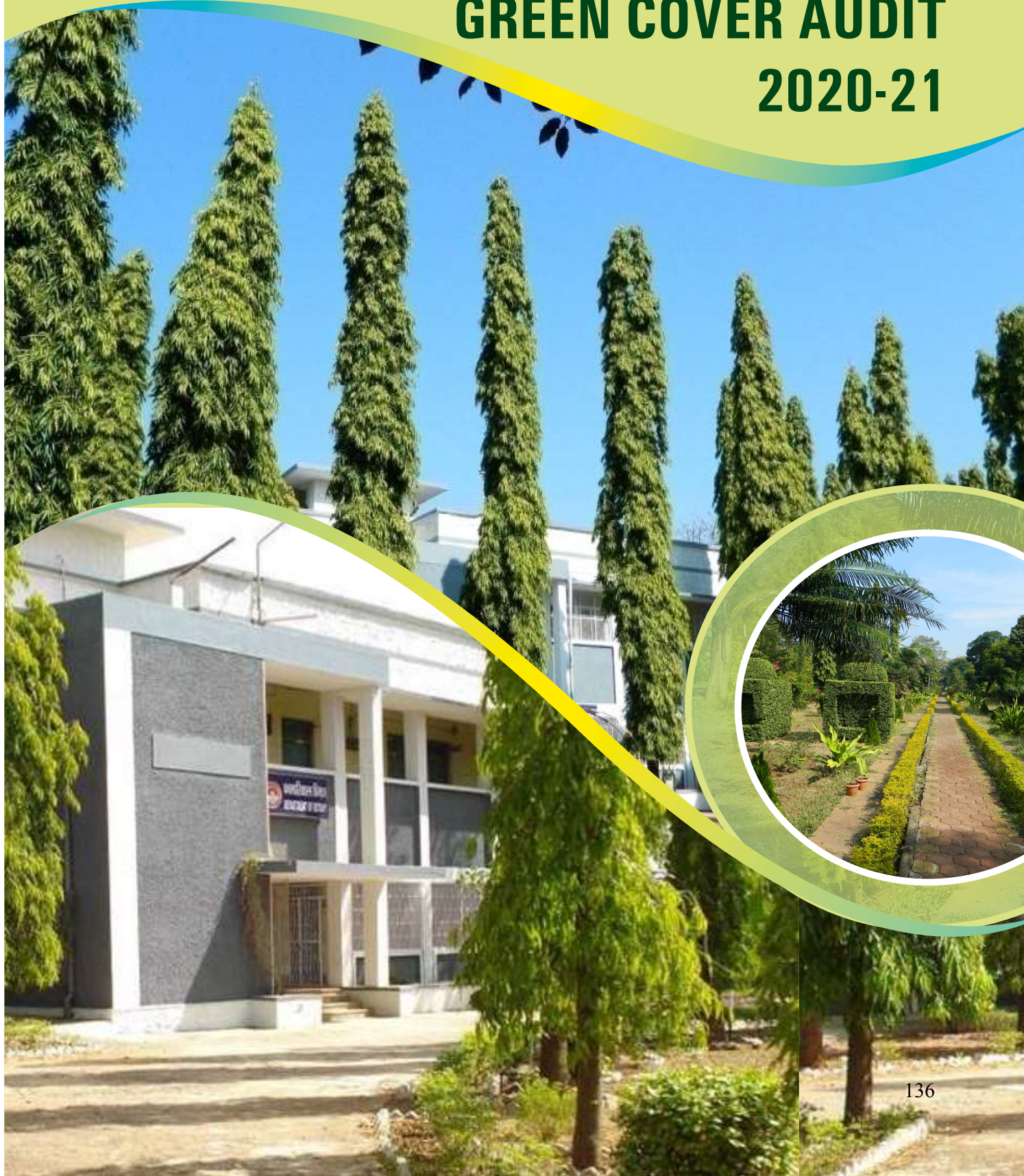


CHAPTER-13

CARBON SEQUESTRATION AND GREEN COVER AUDIT

2020-21





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CARBON SEQUESTRATION AND GREEN COVER AUDIT

Carbon is the basis of life on mother Earth. It is incorporated into the plants through photosynthesis, consumed by animal species through the food, present in the form of carbon dioxide (CO₂) in the atmosphere, locked into the rocks like limestone and compressed into different fossil fuels such as coal and oil. As CO₂ levels in the atmosphere continue to increase, most climate designs or projects that the oceans of the world and trees will keep soaking up more than half of CO₂. The plants on land and in the sea, taking up carbon over many years, increased the percentage discharged during decay, and this increased carbon became locked away as fossil fuels beneath the surface of the planet.

The starting of the 21st century brought growing concern about global warming, climate change, food security, poverty and population growth. In the 21st century, more carbon has been released into the atmosphere than that has been absorbed. CO₂ is a principal component causing global warming. Atmospheric carbon dioxide levels have increased to 40 % from preindustrial levels to more than 390 parts per million CO₂. On this background, it is a need of time to cover the research areas interrelated with climate change.

The “Carbon Sequestration and Green cover inventory” is a current status of tree cover and vegetation carbon storage assessment of the area under Dr. Harisingh Gour Vishwavidyalaya, Sagar, campus. In an era of climate change and global warming, carbon emission, carbon footprints, carbon sequestration, adaptations, mitigation are the keywords in academia. Carbon sequestration is a process of converting atmospheric carbon, i.e. CO₂, into other sinks of carbon such as vegetation, soil, ocean, etc., in various forms to mitigate global warming audit is one of the important clauses of the Kyoto Protocol.

Table-32: List of the significant trees that contributes to significant carbon sequestrations in the university campus.

Eastern Side from the Botany Department up to Patheriya boundary				
S. No.	Family	Common Name	Botanical name	Number
1.	Annonaceae	Ashoka	<i>Polyalthiasp.</i>	76
2.	Arecaceae	Palm	<i>Dypsislutescens</i>	10
3.	Apocynaceae	Chandani	<i>Tabernaemontanadivaricata</i>	2
4.	Fabaceae	Chhoti gulmohar	<i>Caesalpinia pulcherima</i>	2
5.	Apocynaceae	Karonda	<i>Carrisacarandus</i>	29
6.	Fabaceae	Gunja	<i>Lenneacoromendelica</i>	43
7.	Combretaceae	Harad	<i>Terminalliachebula</i>	10
8.	Malvaceae	Kalpvriksha	<i>Adenonia digitata</i>	2
9.	Arecaceae	Khajur	<i>Phoenix dactylifera</i>	24



10.	Apocynaceae	Dudhi	<i>Holarrhenadysenterica</i>	16
11.	Verbenaceae	Sagona	<i>Tectona grandis</i>	2949
12.	Fabaceae	Palash	<i>Butea monosperma</i>	319
13.	Fabaceae	Gulmohar	<i>Delonix regia</i>	829
14.	Bombaceae	Semal	<i>Bombax ceiba</i>	14
15.	Anacardiaceae	Aam	<i>Mangifera indica</i>	1165
16.	Annonaceae	Ramphal	<i>Annona reticulata</i>	2
17.	Ulmaceae	Chirol	<i>Holoptelia integrifolia</i>	1
18.	Ebenaceae	Tendu patta	<i>Diospyros melanoxylon</i>	1170
19.	Rutaceae	Neemboo	<i>Citrus limon</i>	295
20.	Rutaceae	Mausami	<i>Citrus limetta</i>	78
21.	Moraceae	Peepal	<i>Ficus religiosa</i>	139
22.	Myrtaceae	Amrood	<i>Psidiumguajava</i>	216
23.	Myrtaceae	Eucalyptus	<i>Eucalyptus sp.</i>	66
24.	Rutaceae	Madhukamini	<i>Murrayapaniculata</i>	2267
25.	Oleaceae	Parijat	<i>Nyctanthesarbor-tritis</i>	64
26.	Sapindaceae	Kusum	<i>Schleicheraoleosa</i>	2
27.	Meliaceae	Mahaneem	<i>Melia azedarach</i>	23
28.	Phyllanthaceae	Aamla	<i>Phyllanthus emblica</i>	771
29.	Combretaceae	Saaj	<i>Terminalia tomentosa</i>	17
30.	Fabaceae	Imli	<i>Tamarindus indica</i>	79
31.	Sapotaceae	Khinni	<i>Manilkara hexandra</i>	13
32.	Sapindaceae	Kasai	<i>Bredalia retusa</i>	5
33.	Poaceae	Baans	<i>Bambusa vulgaris</i>	10379
34.	Rubiaceae	Papda	<i>Gardenia latifolia</i>	5
35.	Verbenaceae	Gamhar	<i>Gmelina arborea</i>	26
36.	Casurinaceae	Casurina	<i>Casurinaequisitifolia</i>	247
37.	Sapotaceae	Maulshree	<i>Mimusopselengi</i>	708
38.	Moraceae	Umar/ gullar	<i>Ficus racemosa</i>	261
39.	Moraceae	Bargad	<i>Ficus benghalensis</i>	409
Western Side from the Botany Department up to Military Lake boundary				
1.	Annonaceae	Ashoka	<i>Polyalthia sp.</i>	132
2.	Fabaceae	Sita Ashoka	<i>Saraca indica</i>	16
3.	Casurinaceae	Casurina	<i>Casurina equisetifolia</i>	20
4.	Begoniaceae	Tecoma(Yellow bells)	<i>Tecoma stans</i>	10
5.	Myrtaceae	Jamun	<i>Syzygiumcumimi</i>	40
6.	Meliaceae	Neem	<i>Azadiracta indica</i>	521
7.	Sapotaceae	Khirni	<i>Mimusopshexandra</i>	49
8.	Fabaceae	Kachnar	<i>Bauhinia variegata</i>	137
9.	Sapotaceae	Mahua	<i>Madhuca indica</i>	17
10.	Fabaceae	Gulmohar	<i>Delonix regia</i>	78
11.	Lamiaceae	Sagona	<i>Tectona grandis</i>	3610
12.	Rutaceae	Bel	<i>Aegle marmelos</i>	1522



13.	Moraceae	Peepal	<i>Ficus religiosa</i>	55
14.	Malvaceae	Semal	<i>Bombax ceiba</i>	4
15.	Myrtaceae	Eucalyptus	<i>Eucalyptus sp.</i>	217
16.	Combretaceae	Saj	<i>Terminalia tomentosa</i>	56
17.	Moraceae	Bargad	<i>Ficus benghalensis</i>	117
18.	Anacardiaceae	Chironji/ Achar	<i>Buchananialanza</i>	16
19.	Ulmaceae	Chirol	<i>Holoptelia integrifolia</i>	5
20.	Fabaceae	Khair	<i>Acacia catechu</i>	1856
21.	Anacardaceae	Aam	<i>Mangifera indica</i>	835
22.	Dilleniaceae	Dillenia	<i>Dillenia indica</i>	2
23.	Magnoliaceae	Champa	<i>Michellia champaka</i>	10
24.	Combretaceae	Baheda	<i>Terminalia bellirica</i>	10
25.	Nyctanthes	Parijat	<i>Nyctanthes arbor-tristis</i>	25
26.	Fabaceae	Palash	<i>Butea monosperma</i>	2118
27.	Malvaceae	Parash/jungle peepal	<i>Thespesia populnea</i>	1
28.	Lythraceae	Kariya seja	<i>Lagerstroemia parviflora</i> Roxb.	16
29.	Phyllanthaceae	Amla	<i>Phyllanthus emblica</i>	26
30.	Fabaceae	Seesam	<i>Delbergiasisso</i>	29
31.	Fabaceae	Kanji	<i>Pongamia pinnata</i>	18
32.	Anacardiaceae	Gunja	<i>Lanneacoromandelica</i>	117
33.	Fabaceae	Cassia siamese	<i>Senna siamea</i>	2
34.	Fabaceae	Jangal Jalebi	<i>Pithecellobium dulce</i>	2
35.	Rutaceae	Madhukamini	<i>Murraya paniculata</i>	84
36.	Rutaceae	Meethi neem	<i>Murraya koenigii</i>	5
37.	Malvaceae	Kapaas	<i>Gossypium arboreum L.</i>	10
38.	Santalaceae	Chandan	<i>Santalum album</i>	1751
39.	Boraginaceae	Ratanjot	<i>Alkanna tinctoria</i>	8221
40.	Fabaceae	Amaltas	<i>Cassia fistula</i>	119
41.	Poaceae	Baans	<i>Bambusa vulgaris</i>	20
42.	Rhamnaceae	Ber	<i>Ziziphus mauritiana</i>	250
Northern Side from the Botany Department up to Sironja boundary				
1.	Sapotaceae	Maulshree	<i>Mimusops elengi</i>	34
2.	Rhamnaceae	Ber	<i>Ziziphus mauritiana</i>	250
3.	Meliaceae	Mahaneem	<i>Melia azedarach</i>	329
4.	Fabaceae	Babool	<i>Acacia nilotica</i>	4227
5.	Anacardiaceae	Aam	<i>Mangifera indica</i>	1129
6.	Fabaceae	Kachnar	<i>Bauhinia variegata</i>	921
7.	Meliaceae	Neem	<i>Azadirachta indica</i>	2331
8.	Fabaceae	Seesam	<i>Delbergia sissoo</i>	20
9.	Rutaceae	Kaitha	<i>Feronia acidissima</i>	10
10.	Annonaceae	Sitaphal	<i>Annona squamosa</i>	337
11.	Santalaceae	Chandan	<i>Santalum album</i>	1561
12.	Combretaceae	Baheda	<i>Terminalia bellirica</i>	20



13.	Phyllanthaceae	Aamla	<i>Phyllanthus emblica</i>	844
14.	Fabaceae	Nodosa	<i>Cassia javanica</i>	60
15.	Fabaceae	Angrezi imli	<i>Pithecellobium dulce</i>	2227
16.	Ulmaceae	Chirol	<i>Holoptelia integrifolia</i>	10
17.	Fabaceae	Palash	<i>Butea monosperma</i>	5661
18.	Fabaceae	Renja(safed Babool)	<i>Acacia leucopholea</i>	5110
19.	Verbenaceae	Sagon(Teak)	<i>Tectona grandis</i>	5661
21.	Fabaceae	Amaltas(Golden shower Tree)	<i>Cassia fistula</i>	311
22.	Rutaceae	Bael(Bengal quince)	<i>Aegle marmelos</i>	612
23.	Rubiaceae	Kadamba	<i>Neolamarckia cadamba</i>	15
24.	Fabaceae	Ashoka	<i>Saraca ashoka</i>	5
25.	Caesalpiniaceae	Chhoti Gulmohar	<i>Caesalpinia pulcherrima</i>	50
26.	Myrtaceae	Eucalyptus	<i>Eucalyptus globulus</i>	629
27.	Moraceae	Peepal	<i>Ficus religiosa</i>	319
28.	Moraceae	Bargad(Banyan)	<i>Ficus beghalensis</i>	516
29.	Fabaceae	Imli	<i>Tamarindus indica</i>	2378
30.	Apocynaceae	Safed kaner	<i>Nerium oleander</i>	16
33.	Ebinaceae	Tendu patta	<i>Diospyros melanoxylon</i>	319
34.	Magnoliaceae	Champa	<i>Michelia champaka</i>	10
35.	Oleaceae	Parijat	<i>Nyctanthes arbor-tristis</i>	30
36.	Putranjivaceae	Putranjiva	<i>Putranjiva roxburghii</i>	11
37.	Fabaceae	Gulmohar	<i>Delonix regia</i>	417
38.	Rutaceae	Kaitha(Elephant apple)	<i>Feronia limonia</i>	27
39.	Myrtaceae	Bottle brush	<i>Callistemon Sp.</i>	100
40.	Myrtaceae	Jamun	<i>Syzygium cumini</i>	21
41.	Sapotaceae	Khirni	<i>Manilkara hexandra</i>	41
42.	Moraceae	Sahtoot(Mulberry)	<i>Morus alba</i>	18
46.	Cu-pressaceae	Morpankhi	<i>Platycladus orientalis</i>	25
47.	Rutaceae	Meethi neem	<i>Murraya koenigii</i>	25
48.	Apocynaceae	Safed champa	<i>Plumeria obtusa</i>	17
Southern Side from the Botany Department up to Stadium boundary				
1.	Sapotaceae	Maulshree	<i>Mimusops elengi</i>	82
2.	Fabaceae	Ashoka	<i>Saraca asoca</i>	39
3.	Santalaceae	chandan	<i>Santalum album</i>	1127
4.	Meliaceae	Neem	<i>Azadirachta indica</i>	778
5.	Fabaceae	Palash	<i>Butea monosperma</i>	561
6.	Moraceae	Bargad	<i>Ficus benghalensis</i>	113
7.	Anacardiaceae	Aam	<i>Mangifera indica</i>	40
8.	Moraceae	Peepal	<i>Ficus religiosa</i>	7
9.	Fabaceae	Gulmohar	<i>Delonix regia</i>	45
10.	Myrtaceae	Eucalyptus	<i>Eucalyptus globulus</i>	57



11.	Ulmaceae	Chirol	<i>Holoptelia integrifolia</i>	21
12.	Fabaceae	Kachnar	<i>Bauhinia variegata</i>	24
13.	Phyllanthaceae	Aamla	<i>Phyllanthus emblica</i>	58
14.	Fabaceae	Seesam	<i>Delbergia sissoo</i>	13
15.	Fabaceae	Nodusa	<i>Cassia javanica</i>	17
16.	Meliaceae	Mahaneem	<i>Melia azedarach</i>	23
17.	Rutaceae	Madhukamini	<i>Murraya paniculata</i>	617
18.	Bignoniaceae	Tecoma	<i>Tecoma capensis</i>	5
19.	Fabaceae	Babool	<i>Vachellia nilotica</i>	37
20.	Fabaceae	Gunja	<i>Lenneacoro mendelica</i>	612
21.	Poaceae	Baans	<i>Bambusa vulgaris</i>	20
22.	Fabaceae	Amaltas	<i>Cassia fistula</i>	119
23.	Fabaceae	Renja	<i>Acacia leucophloea</i>	1212

Reducing the Carbon Footprints:

- Installation of solar panels or solar energy generation devices should be enhanced to reduce the electricity footprint of the campus. Terrace of each building can be utilized to produce electricity from tiltable solar modules.
- The food waste generated from university hostel mess, guest house, canteens and staff quarters should be converted into the biogas which can be further utilized for hostel kitchens.
- The solar battery operated vehicles should be used on the campus to overcome the vehicle footprint.
- The Green computing or E- work is helping the organization to reduce footprint very effectively.
- The solar energy based street lamps on campus will reduce carbon footprint.
- The awareness should be made among the faculty, students and other employees regarding Clean Development Mechanism (CDM) to reduce the consumption of electricity and natural resources.
- Plantation in university campus to increase the green cover, which will ultimately reduce carbon print and will support the life system by providing fresh air.