R. N. College, Hajipur

Vaishali, Bihar-844101

GREEN AUDIT

(2020-21)



Under the Supervision of Dr. Priyanka Chatterjee, Assistant Professor, Department of Botany, R.N. College, Hajipur with guidance from Dr. Mahesh Roy.

ACKNOWLEDGEMENT

I, Dr. Priyanka Chatterjee, Assistant Professor, Department of Botany want to give special thanks to our Principal Professor (Dr.) Ravi Kumar Sinha, who continuously inspires and gives support & suggestions for such an important assignment. I am also thankful to our former retired H.O.D. Prof Mahesh Roy & the present H.O.D of Botany Department Dr. Rosline Soren, Nitu Bharti, H.O.D of Zoology Department Dr. Sushma Kumari, Dr. Vijay Kumar, Dr. Rakesh Mohan & Gaurav Kumar & Aniket Kumar from the Department of Biotechnology & Arjun Prasad (non-teaching staff of Department of Botany) for the journey of Green Audit project work. Still now it is continuing in process for plantation of more new & rare trees, set up of green-houses & others work for the purity of air and greenery of the college campus for building of socio-environmental culture.

INTRODUCTION:

Green Audit is a process of systematic identification, quantification, recording, reporting and analysis of components of environmental diversity of the college campus. Green audit of the college campus has been done periodically to ensure the role of Institution in mitigating the present environmental problems. Green Audit of the R.N. College campus for the academic year 2020-2021 is done by the supervision of Dr. Mahesh Roy & Dr. Priyanka Chatterjee, Assistant Professor & it's team from Department of Botany in association of Biotechnology, Zoology & Geography Department.

It aims to analyses environmental practices within and outside of the concerned place, which will have an impact on the eco-friendly atmosphere. Green audit is a valuable means for a college to determine how and where they are using the most energy or water or other resources; the college can then consider how to implement changes and make savings. It can create health consciousness and promote environmental awareness, values and ethics. It provides staff and students better understanding of Green impact on campus. If self-enquiry is a natural and necessary outgrowth of a quality education, it could also be stated that institutional self-enquiry is a natural and necessary outgrowth of a quality educational institution. Thus it is imperative that the college evaluate its own contributions toward a sustainable future. As environmental sustainability is becoming an increasingly important issue for the nation, the role of higher educational institutions in relation to environmental sustainability is more prevalent. The rapid urbanization and economic development at local, regional and global level has led to several environmental and ecological crises. On this

background it becomes essential to adopt the system of the Green Campus for the institutes which will lead for sustainable development and at the same time reduce a sizable amount of atmospheric CO₂ from the environment.

OBJECTIVES:-

In recent time, the Green Audit of an institution has been becoming a paramount important for self-assessment of the institution which reflects the role of the institution in mitigating the present environmental problems. The college has been putting efforts to keep our environment clean since its inception. Therefore, the purpose of the present green audit is to identify, quantify, describe and prioritize framework of Environment Sustainability in compliance with the applicable regulations, policies and standards.

The main objectives of carrying out Green Audit are:

- 1. To map the geographical location and recording of the meteorological parameters of Raj Narain College, Hajipur
- 2. Documentation of the floral and faunal diversity of the College
- 3. To estimate the energy requirement of the College
- 4. Documentation of the waste disposal system/ recycling system
- 5. Rain water harvesting/ Ground water recharge system
- 6. To document the ambient environmental condition of weather, air, water and noise of the college
- 7. To estimate Carbon foot print
- 8. To introduce and make students aware of, real concerns about environment and it's sustainability

1. MAPPING OF THE GEOGRAPHICAL LOCATION & RECORDING OF THE METEOROLOGICAL PARAMETERS OF RAJ NARAIN COLLEGE, HAJIPUR

The college has a sprawling pollution-free green campus spread over in the heart of the Hajipur Town.

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DMS Coordinates - 250 40' 48"N - 250 69'24" N

DD Coordinates - 850 13' 12" E - 850 20 '83" E

Area - 19.64 Sq km

Altitude - 46 M (151 feet)
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Climate - Semi-tropical Monsoon type

Precipitation. - 998 ml. (39.6 inch)

Temperature - 25^o average

2. DOCUMENTATION OF THE FLORAL AND FAUNAL DIVERSITY OF THE COLLEGE

PREAMBLE

Vegetational diversity of a region or locality adds valuably to its natural landscape and scenic beauty as also contributes a lot in maintaining a healthy and pleasant atmosphere. This has further got an immense ecological importance in that it promotes ecosystem stability and dynamic equilibrium for a sustainable community of plant populations. Floristic richness has an aesthetic component also as it offers amble recreational pleasure to humans. For an institution of higher education offering undergraduate and post-graduate courses in Botany, campus plantation is an important requirement which provides a variety of live specimens for purposeful studies and observations. Floristic documentation of the campus and its periodical review is an equally important aspect of botanical investigation which confers a quality tag of practical consciousness upon the faculty of the Botany Department

NAAC Accreditation process of the College has necessitated a lot of preparatory exercises in fulfilling the desired level of institutional quality status. Botany Department of the College was assigned the responsibility of carrying out a Green Audit of the campus with a view to updating and enlisting prominent species of shrubs, under trees and trees along with their botanical names, trivial names and taxonomic status. The assigned project was accomplished with collective effort of the faculty members and B. Sc. and M. Sc. students of the Department under the leading supervision of Retired HOD. Dr. Mahesh Roy, Department of Botany and from the year 2021-2022 under the supervision of Dr. Priyanka Chatterjee, Assistant Professor Department of Botany.

This detail of species composition of the campus flora is tabulated below:

PLANT SPECIES NAME

S.No	Botanical Name	English Name	Trivial Name	Family	Category	Numerical Strength
1	Mangifera indica condition few species of Ma	Mango ngo Trees are dried)	Aam	Anacardiaceae 30	Tree (In this ye	ear due to heavy rain & water logged
2	Saraca asoca	Asoka	Sita Ashoka	Annonaceae	Tree	25
3	Feronia elephantu	Elephant apple	Kaith/kaitha	Rutaceae	Tree	2
4	Eucalyptus globosus	Eucalyptus tree	Sufeda	Myrtaceae	Tree	1
5	Tectona grandis	Teak wood	Sagwan	Verbenaceae	Tree	12
6	Emblica officinalis	Emblic myrobalan	Amla	Euphorbiaceae	Tree	2
7	Eugenia jambolana	Black berry	Jamun	Myrtaceae	Tree	2
8	Dalbergia sissoo	Indian Redwood	Shishoo	Papilionaceae	Tree	2
9	Bombax ceiba	Silk cotton tree	Semul	Bombacaceae	Tree	3
10	Azadirachta indica syn. Melia	<u>azadirachta</u> Margosa tree	Neem	Meliaceae	Tree	1
11	Delonix regia	Gold Mohur	Gul Mohur	Caesalpinaceae	Tree	8
12	Anthocephalus kadamba		Kadamb	Rubiaceae	Tree	1
13	Tamarindus indica	Tamarind	Imli	Caesalpinaceae	Tree	1
14	Artocarpus integra	Jackfruit	Kathal	Moraceae	Tree	1
15	Cassia fistula	Indian laburnum	Amaltas	Ceasalpinaceae	Tree	3
16	Ficus religiosa	Peepal or Bo-tree	Pipal	Moraceae	Tree	1
17	Aegle marmelos	Wood apple	Bel	Rutaceae	Tree	2
18	Mdhuca indica		Mahua	Sapotaceae	Tree	1
19	Cocos nucifera	Coconut palm	Nariyal	Arecaceae (=Palmae)	Under tree	2
			,	coaccac (. a.mac)	3	_

20	Thevetia nerifolia	Yellow oleander	Pila Kaner	Apocynaceae	Under tree	1
21	Nerium odorum	Oleander	Kaner	Apocynaceae	Under tree	1
22	Psidium guyajava	Guava	Amrud	Myrtaceae	Under tree	1
23	Nyctanthes arbortristis	Night jasmine	Harsingar	Oleaceae	Shurb	1
	Codiaeum variegatum					
	24.Garden croton(several varie	eties)				
		Euphorbiaceae	Shurb		21	
25	Hibiscus rosa-sinensis	China-rose/Shoe flower	Udhool	Malvaceae	Shurb	16
26	Cupressaceae Thuja occidentalis (Gymnosperm)	Thuja	Thuja		Shurb	5
				Araucariaceae		
27	Araucaria sp.	Araucaria			Shurb	2
	(Gymnosperm)					
28	Murraya exotica	Chinese box	Kaumini/ Marchula	Rutaceae	Shurb	1
29	Cestrum nocturnum	Queen of the night	Raat Ki Rani	Solanaceae	Shurb	1
30	Rosa chinensis	China rose	oruhul	Rosaceae	Plantea	16
31	Citrus	Citrus	Nimbu	Rutaceae	Tree	1
32	Cycas revoluta	Sago Palm	Palm	Cycadaceae	Gymnosperm	4
33	Pteris	Chinese Brake	Fern	Pteidaceae	Pteridophyte	7
34	Zamia furfuracea	Cardboard Palm	Pine nut	Zamiaceae	Plant	3
35	Jatropha curcas	Nettlespurges		Euphorbiaceae	Plant	10
36	Laurus nobilis	Bay laurel	Tej Patta	Lauraceae	Shrub	1
37	Musa acuminata	Red Banana	Scarlet banana	Musaceae	Plant	1
38	Jatropha integerrima	Spicy Jatropha	Jatropheae	Euphorbiaceae	Shrub	6
39	Butea monosperma	Butea		Fabaceae	Plant	1
40	Luma apiculata	Chilean myrtle	luma	Myrtaceae	Tree	2

41	Sideroxylon foetidissimum	Barbados-mastic		Sapotaceae	Tree	2
42	Dypsis lutescens	Butterfly palm	palm	Arecaceae	Tree	2
43	Phoenix roebelenii	Roebelin plam	Palm	Arecaceae	Tree	4
44	Diospyros nigra	Chocolate sapote	Black sapote	Ebnaceae	Tree	1
45	Brosimum alicastrum	Breadnut	Breadnut	Moraceae	Tree	1
47	Dypsis madagascariensis	Dysis		Arecaceae	Shrub	5
48	Toona ciliata	Red Ceder	Cedar	Meliaceae	Tree	1
49	Swietenia mahagoni	Mahogany	Mahogany	Maliaceae	Tree	1
50	Syzygium cumini	Blackberry	Jamun	Myrtaceae	Tree	1
51	Phyllanthus Emblica	Goooseberry	Amla	Phyllanthaceae	Tree	1
52	Piper betle	Plam	Khajoor	Arecaceae	Tree	4
53	Dieffenbachia seguine	Dumb Cane	Dumb Cane	Arecaceae	Shrub	6
54	Croton	Croton	Rushfoil	Euphorbiaceae	Shrub	2
55	Tinospora cordifolia	Giloy	Giloy	Menispermaceae	Shrub	1
56	Dracenea	Corn Plant	Corn	Asparacaceae	Shrub	2
57	Plumeria Alba	White Frangipani	Champa	Apocynaceae	Tree	2
58	Vasconacellea badilloi	Mountain Papaya	Pahari Papita	Caricaceae	Tree	3
59	Acalypha wikesiana	Copper leaf	Tamba patta	Euphorbiaceae	Shrub	1
60	Rosa rubiginosa	Rose	Gulab	Rosaceae	Shrub	6
61	Catharanthus roseus	Sadabahar	Sadasuhagan	Apocynaceae	Shrub	10
62	Cordia myxa	Indian-cherry	Glueberry	Boraginaceae	Tree	2
63	Vaccinium mrytillus	Blaeberry	Europian blueberry	Ericaceae	Shrub	4
64	Melaleuca brateata	Black teatree	Kali chai	Myrtaceae	Tree	1
65	Afrocanthium mundianum	Rock Alder	Alder	Rubiaceae	Shrub	2

66	Euphorbia neriifolia	Sweet aloes	Aloes	Euphorbiaceae	Shrub	5
67	Colubrin asiatica	Wild coffee	Wild coffee	Ramnaceae	Shrub	1
68	Garcinia xipshuanbannaensis	Garcinia		Clusiaceae	Tree	1
69	Mimusops elengi	Medlar	Medlar	Saptaceae	Tree	1
70	Alnus acuminata	Andean Alder	Alder	Betulaceae	Shrub	2











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Common name – Giloy









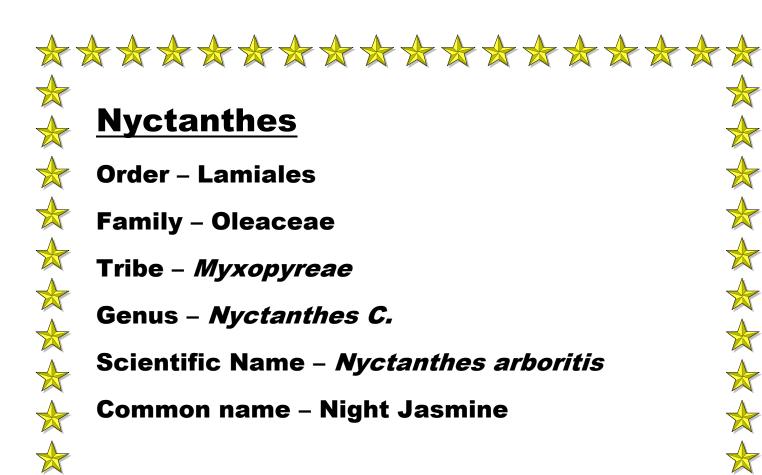








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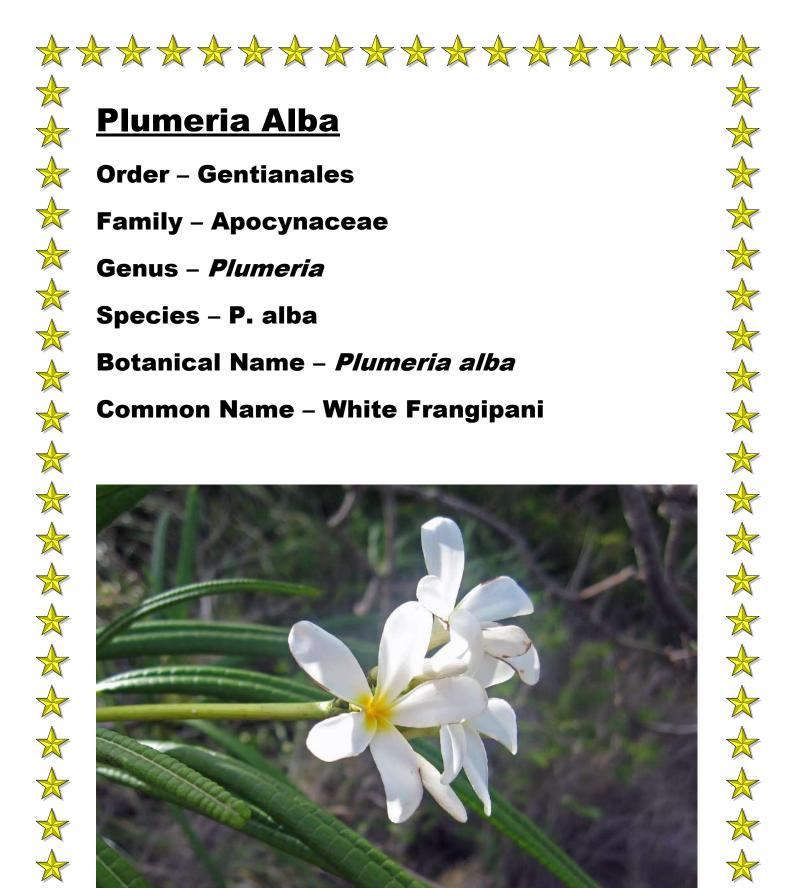


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Species: Cordia myxa

Family: Boranginaceae

Genus: Cordia

Common Names: Indian-cherry

Uses: FOOD: fruits, MEDICINE: folklore



Species: *Euphorbia tithymaloides*

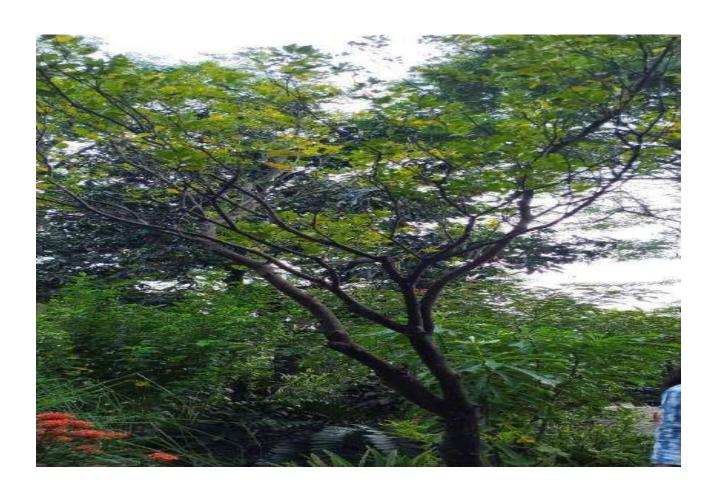
Family: Euphobiaceae

Genus: Euphorbia

Common Names: Devil's backbone

Uses: Environmental Uses: ornamental

Poison: Mammals



Species: *Toona ciliata*

Family: Meliaceae

Genus: Toona

Common Name: Red Cedar



Species: Cycas revoluta

Family: Cycadaceae

Genus : Cycas

Common Name : Sago palm

Uses: Environmental uses, ornamental

Medicine - folklore



Species: Vaccinium Myrtillus

Family: Ericaceae

Genus: Vaccinium

Common Names : Blaeberry; Europian

Blueberry

Uses: food additive: dye;

food: beverage base fruit; forage:

fodder; gene sources:

genetic input; material: tannin/dye medicine:

folklore; bee plants: honey



Species: *Melaleuca bracteata*

Family: Myrtaceae

Genus: Melaleuca

Common Name: Black teatree



Species: *Dypsis madagascariensis*

Family: Arecaceae

Genus : *Dypsis*



Species: *Afrocanthium mundianum*

Family: Rubiaceae

Genus: Afrocanthium

Common Name: Rock Alder



Species: *Brosimum alicastrum*

Family: Moraceae

Genus: Brosimum

Common Name: Breadnut

Uses: MEDICINE: folklore



Species: *Diospyros nigra*

Family: Ebenaceae

Genus: *Diospyros*

Common Name: Black sapote, chocolate

pudding fruit, chocolate sapote



Species: Euphorbia neriifolia

Family: Euphorbiaceae

Genus: Euphorbia

Common Name: Sweet – aloes

Uses: environmental uses:

Ornamental; medicine: folklore;

Poison: fish mammals



Species: *Colubrina asiatica*

Family: Ramnaceae

Genus: Colubrina

Common Name: Wild coffee



Species: *Garcinia xipshuanbannaensis*

Family: Clusiaceae

Genus : Garcinia



Species: *Afrocanthium mundianum*

Family: Rubiaceae

Genus: Afrocanthium

Common name: Rock Alder



Species: *Dypsis madagascariensis*

Family: Arecaceae

Genus : *Dypsis*



Species: *Mimusops elengi*

Family: Saptaceae

Genus: *Mimusops*

Common Name: Medlar

Uses: Environmental uses:

Ornamental; Material: wood; Medicine:

folklore



Species: *Phoenix roebelenii*

Family: Arecaceae

Genus: *Phoenix*

Common Name: Roebelin palm

Uses: Environmental uses:

Oranamental; Gene Source: genetic

input



Species: *Araucaria columnaris*

Family: Araucariaceae

Genus: Araucaria

Common: Cook's pine



Species: Alnus acuminata

Family: Betulaceae

Genus: Alnus

Common Names: Andean Alder



Species: *Bambusa vulgaris*

Family: Poaceae

Genus: Bambusa

Commom Name: Bamboo



Species: *Rhododendron ponticum*

Family: Ericaceae

Genus: Rhododendron

Common Name: *Pontian rhododendron*



Species: *Dypsis lutescens*

Family: Arecaceae

Genus : *Dypssis*

Common name: Butterfly palm



Species: *Tabernaemontana*

Family: Apocynaceae

Genus: *Tabernaemontana*

Common Name: Giant pinwheel-flower



Species: *Tebernaemontana*

donnellsmithii

Family: Apocynaceae

Genus: Tabernaemontana

Common Name: Horse Balls Tree



Species: *Plumeria pudica*

Family: Apocynaceae

Genus: Plumeria

Common Name: Bridal boquet



Species: Ficus aurea

Genus: Ficus

Family: Moraceae

Common Name : Florida strangler



Species: Sideroxylon foetidissimum

Family: Sapotaceae

Genus: Siderroxylon

Common Name : Barbados - mastic



Species : Zamia furfuracea

Family: Zamiaceae

Genus: Zamia

Common Name: cardboard palm



Species: *Agave fourcroydes*

Family: Asparagaceae

Genus : *Agave*

Common Name: Yucatan sisal



Species: *Cordyline rubra*

Family: Aspargaceae

Genus : Cordyline

Common Name : Palm Lily



Species: Cecropia obtusifolia

Family: Urticaceae

Genus: Cecropia

Common Name: Trumpet; Red Banana



Species: Luma apiculata

Family: Myrtaceae

Genus: Luma

Common Name: Chilean myrtle

3. TO ESTIMATE THE ENERGY REQUIREMENT OF THE COLLEGE

On an average of electricity which turns out to be 41664 kilo -watt per year energy & per month 3750 kilo-watt is utilized only to maintain its volumetric activities throughout the year.

- For renewable sources of energy solar PV panels are fitted in the college campus
 & its utilization is about 15%.
- ii) For non-renewable sources of energy General Electricity utilization system are utilized.
- For non-renewable sources of energy Diesel Generator machine 20 kw in examination section and 50 kw for all college is established.
- iv) For non-renewable sources of energy 240 volt & 900 Watt of Invertors are established in an every department of the college.



Fig- Solar PV panel system present on the roof of Arts Block



Fig- Solar PV panel system present on the roof of Administrative Block



Fig- Solar PV panel system present on the roof of Arts block

4. DOCUMENTATION OF THE WASTE DISPOSAL SYSTEM/ RECYCLING SYSTEM

Waste disposal are the activities and actions required to manage waste from its inception to its final disposal. This includes the collection, transport, treatment and disposal of waste, together with monitoring and regulation of the waste management process. The

waste from all around the college is separated daily as wet and dry waste in different bins which are disposed separately.

By the help of all UG & PG department, environment friendly practices and necessary actions taken by the college, such as - energy conservation, production of organic composts by biodegradable products through Vermicomposting procedure that established in the back side of science block of college campus, waste recycling, etc. The biological reusable waste are processed as organic manure for the plants available in the college campus and the other solid waste generated in the college campus is taken to the community bin of Hajipur municipality for recycling and disposal.



Fig- Vermicomposting system present back side of Science block of R.N. College campus

5. RAIN WATER HARVESTING/ GROUND WATER RECHARGE SYSTEM

In R.N. College campus four or five places, in front of History department, near to Girls common room, near to English department, near to Library etc. Rain water harvesting

system through underground pipeline systems has established. These are fully covered by our green vegetation that easily absorbed water.

Following photographs are given below:-



Fig-Rain water harvesting /Ground water Recharge system near Girls common room



Fig-Rain water harvesting /Ground water Recharge system near History Department

6. TO DOCUMENT THE AMBIENT ENVIRONMENTAL CONDITION OF WEATHER, AIR, WATER AND NOISE OF THE COLLEGE

Weather:- Semi -Tropical, due to coastal region of River Ganga & Gandak.

Air:- Air quality is good

Water:-i) Fresh ground water used through submersible motor pump

ii) pH water is 7.5 & TDS is 325 ppm

Noise:-Noise pollution is free due to Green environment of the college campus i.e 50-55 decimal (Air index)

Soil:- i) Soil pH is 7.3

ii) Alkalinity in nature

iii) Soil texture is Clay with Sandy due to coastal region of River Ganga & Gandak iv)Soil is full with humus with moisture i.e best for soil fertility for plantation of any type of plant or trees in this college campus.

7. TO INTRODUCE AND MAKE STUDENTS AWARE OF, REAL CONCERNS ABOUT ENVIRONMENT AND IT'S SUSTAINABILITY

By the different ways of students aware of real concerns about environment and it's sustainability are established. These are following:-

- i) by Counseling techniques,
- ii) by Seminars/ Webinars
- iii) by Workshops,
- iv) By Science Day, Earth day, Water Day, Environmental day celebration etc.

8. CARBON FOOT PRINTING

R.N. College having a largest campus in the region and located centrally, staff and students commute on their own. The college is dedicated to provide its students and staff all the comfort and convenience to help them to achieve their targets. The students are encouraged to use cycles, two wheelers rather than four wheelers which leads to fuel saving and also the contribution of pollutants to atmosphere is less.

Students supported for documentation of Flora of R.N.College campus under the supervision of Dr. Priyanka Chatterjee

B.Sc: II YEAR (2020-2023)

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3.Name: Deepali, Roll no: 20BNBT072

4. Name: Nisha Singh, Roll no: 20BNBTO69

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6. Name: Mukul, Roll no: 20BNBT67

7. Name: Puspa

M.SC (BOTANY) 2ND SEMESTER, SESSION – (2020-2022)

- 1.Name Jyoti Kumari , Roll no. 20BNBT013
- 2.Name Gargi Singh, Roll no. 20BNBTOO9
- 3.Name Kundan Kishor, Roll no. 20BNBT015
- 4.Name Priya, Roll no. 20BNBT024
- 5. Name Srishti Kumari, Roll no. 20BNBT030
- 6. Name Sima Kumari , Roll no. 20BNBT029
- 7. Name Shivani Kumari, Roll no. 20BNBT036
- 8. Name Komal Kumari, Roll no. 20BNBT014
- 9. Name Guriya Khatoon, Roll no. 20BNBT010
- 10. Name July Kumari, Roll no. 20BNBT012



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19/06/2021

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THANK YOU