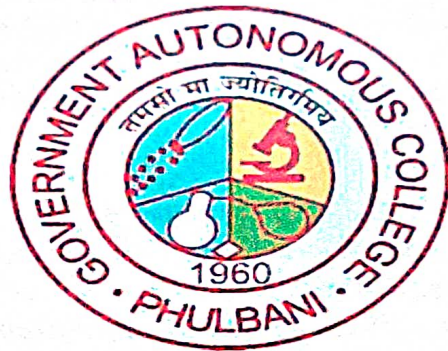


Green Audit Report 2021



Government Autonomous College, Phulbani
Kandhamal, Odisha

PREFACE

The future of humankind depends very much on our ability to change our lifestyles and agree to follow a low consumption pattern of living in terms of resources taken from the globe and return to a sustainable development path at the earliest. Climate around the world – in developed as well as developing regions – has started showing violent changes, destroying life and property and annihilating peaceful living conditions.

The opportunity window for restoring nature to its prolonged state of hosting life forms to flourish under its caring environs is according to scientists, very short and lasting only up to 2030. Within this time, with the willing actions of every citizen wherever they are, coordinated and directed actions should start and continue thereafter till a balancing stage is reached where moderate use of resources and mitigation actions for healing the hurts already inflicted, balance positively to a sustainable nature. If we do not start action now, the situation may go out of control and when our grandchildren reach adulthood; their chances of survival will be very bleak.

Life expectancy of those few who survive will be much shorter than what we have now. This is something we all agree to avoid. The students who are in schools and colleges now are to be the enlightened leaders of immediate tomorrow. Our national educational authorities, as in most developed countries, therefore insist that every student in our country should learn how damages to the environment occur and how to avoid such situations, emphasizing more on possible remedial measures. This green education should start from schools and colleges, and the insistence on Green Audit of higher education institutions on an annual basis is to make students and staff well informed of the extent of ecological footprints each one creates, as well as on which areas one should concentrate to make his or her environs greener than before.

Green Audit team

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INTRODUCTION

The rapid environmental degradation at local, regional and global level is leading us to global "Environmental crisis". Adoption of environmentally friendly and sustainable technologies, clean development mechanism, reforestation and ecological restoration are crucial elements in creating an equitable and sustainable future for all humans in harmony with nature. The main objective to carry out green audit is to check biodiversity and green practices by the Higher Education Institution and to conduct a audit report to understand where we stand on a scale of environmental prospective.

Green audit is the procedure of systematically identifying, quantifying, recordings, reporting and analyzing the environmental diversity components of any organization. Focus was given to assess the consumption of energy, electricity, water as well as an inventory of flora and fauna on campus is also prepared to check how much CO₂ is sequestered and offsetting eqCO₂. It is also helpful to attain carbon neutrality to an extent. It can create health awareness and promote environmental awareness and ethics. It allows faculty, students and other staff to better understand the impacts of green activities on the premises.

Self-inquiry is a natural and expected development of quality education. Therefore, the institute must evaluate its contribution towards a sustainable future. An environmental sustainability has become an increasingly crucial issue for the every nation; the role of higher education institutions in environmental sustainability has become more important. The rapid urbanization and economic development at the regional and global levels have led to several environmental and ecological problems. In this context, it is necessary to adopt a green campus system for the institute, which will lead to sustainable development while reducing the large amount of atmospheric carbon emissions in the environment.

Government of India through its National Environment Policy (2006) has made mandatory for every organization to have green audit in their organization. College Grants Commission has mentioned "Green Campus, Clean Campus" mission mandatory for all higher educational institutes. 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. Accordingly, realizing the need of being responsible towards environment, NAAC (National Assessment and Accreditation Council), an autonomous body under UGC has also added the concept of Environmental Audit in accreditation methodologies of State and Central Universities as well as autonomous colleges. Accordingly, **Government Autonomous College, Phulbani** has also initiated a Green Audit of its campus.

ABOUT THE COLLEGE AND VISION

Year of Establishment: 1960

Government Autonomous College, Phulbani, established in the year 1960, is situated in the heart of a backward tribal district, Kandhamal in Odisha. It was a premier Institution in the erstwhile tribal district of Boudh and Phulbani under the nomenclature of Government Science College Phulbani. The College was originally affiliated to The College, Bhubaneswar with subject affiliation of all major subjects in the faculties of Arts and Science. After the establishment of Berhampur College in 1967 in the South Zone of Orissa, the College was affiliated to this College under the nomenclature of Government College, Phulbani. In 1991, the College got the status of a Lead College and subsequently U.G.C. conferred Autonomous status on the College in 2004. Post Graduate affiliation was received for P.G. in Political Science in 1980. Later in 1990 B.Com. classes were introduced and M.Sc. in Life Sciences was introduced in the year 1994.

The College was selected as a Study Center of Indira Gandhi National Open College in 1989-90. Support services for students like N.C.C. , N.S.S., Red Cross, SC / ST Pre Employment Coaching Centre, Project Genesis Training facility (INFOSYS) are available to cater to the needs of the students. At present the College provides teaching facility in Arts, Science and Commerce at Under Graduate level, and P.G. teaching facilities in Anthropology, Economics, Life Sciences, Physics and Political Sciences. There are 18 teaching departments with a student strength of 875. There is one P.G. Hostel, one Under Graduate Hostel and one Ladies Hostel which provide accommodation for 280 students including 120 girls students.

The College is located in the lap of idyllic natural surroundings in a valley surrounded by lush green hillocks and a murmuring river "Salunki" which provides educational inspirations to the young minds pursuing their studies in this august Institution. The College is poised for prosperity and is dedicated to disseminate knowledge, higher education in the midst challenging circumstances.

VISION:

To create an advanced centre of learning of national standard where pursuit of knowledge and excellence shall reign supreme, unfettered by the barriers of nationality, language and religion.

MISSION:

1. To impart quality education and imbibe skill for solving real life problems.
2. To create leadership qualities with futuristic vision
3. To foster spirit of entrepreneurship and realization of societal responsibilities
4. To cultivate adaptation of ethics, morality and healthy practices in professional life
5. To instill habit of continual learning
6. To encourage and support creative abilities and research temperament

Objectives of the Green Audit

- To understand the awareness of employees and learners towards environmental conservation
- To prepare a inventory of biodiversity of the campus.

- To recognize the initiative taken by organization towards environmental conservation
- To study waste minimization and safe disposal of hazardous wastes
- Initiatives for water and energy conservation
- To diagnose and find out solutions for the environmental problems
- To facilitate the stakeholders with different aspects of mitigation of environmental management

Figure 1. Layout of the College:



Imagery ©2022 CNES / Airbus, Maxar Technologies, Map data ©2022 50 m

METHODOLOGY

An environmental audit has three phases - pre-audit stage, audit stage and post-audit stage, accordingly the environmental audit was conducted.

PRE-AUDIT STAGE (Capacity building and preliminary information collection)

Pre audit stage requires capacity building at college (which includes the participation of students and staff of various departments) and other information supports for carry out the green audit report.

Pre-audit stage involved the identification of target areas for environmental auditing.

The following target areas were identified

- Land Use Pattern
- Biodiversity Status
- Energy consumption
- Carbon footprint
- Environmental Awareness
- Mitigation and Management practices

AUDIT STAGE

(A). Collection of data, observation and interaction: This stage of the Audit involved the activities relating to collection of data, observation, interactions and discussion with the concerned stakeholders i.e., faculty, administration and staff members from different departments and sections of the college. A mixture of open ended and closed ended questionnaires were developed and used for data collection. Meetings with specific stakeholders of different target groups identified in the pre-audit stage were conducted for getting the desired information. Detailed discussions on some specific topic were also held.

Questionnaire for Green Audit

1. How many heavy consumption machines or equipment are there in your Department/Office/Establishment? Please provide information about its capacity (W) and average usage per month.

Name	Total Number	Energy Consumption (W)	Usage per day (hrs)
1.			
2.			

3. What is the number of energy efficient electronic gadgets/items (5star or LED or Low voltage machines etc.) present in your department/office/establishment? What is their consumption capacity? prepare a list if possible.

Name of Electrical equipment/gadget/item	Total number in	Consumption Capacity (W)	No of Energy Efficient/LEDs/5 Star rated Electrical Units
1. Lightening bulb/bars etc.			
2. Fan (ceiling/ pedestal/ exhaust)			
3. Air Conditioner			
4. Refrigerator			
5. TV			
6. Water purifier			
7. Computer			
8. Printer/Scanner			
9. Xerox Machine			
10. Any other			

3. Is there any alternate source of energy present in your department/office? (e.g., solar panels, Biogas, windmills etc.) (If yes, what is its installation capacity in kW h or Litres per day?)

4. Are there any steps taken for sewage treatment installed in your department/office/establishment?
(Supply details if any)

(B) Review of previous records and policies: This was carried out in order to understand the various initiatives taken by the college towards sustainable environmental conservation and amelioration. For the purpose, office registers, visitor's book, purchase registers, office communications, policy level documents of AC/ EC were also examined. Further, the published material such as prospectus, college annual reports, bulletins, and other magazines were also studied by the audit team for getting information / data on the target aspects.

(C) Inspection of departments/sections/various sites: The audit team also visited the various departments, sections, offices and its premises in order to have an idea of various activities carried. Campus greenery and gaps were identified. Team also had a visit to play ground, canteen, library, office rooms and parking area.

(D) The stakeholders: The stakeholders included were teaching staff from different departments, people from administration, water supply and maintenance, electricity department and ICT. The committee set up for the purpose discussed the issues related with key target areas. Questionnaires were prepared for getting information and accordingly meeting with concerned stakeholders were conducted. Data on water and energy use was collected from maintenance department.

POST-AUDIT STAGE

The Post-Audit Stage includes the production of the final report, prepare action plan to overcome the flaws and to keep a watch on the action plan.

(Mention the flaws and emergency response)

LAND USE AUDIT

The College land use system include Academic/ Administrative building, various departments, canteens, road, parks, library, sports complex, banks, forest area, hostels etc.

As green audit report focuses on the green cover the following data are extracted from the GIS and RS database (Fig. 2).

Figure 2. Land use Map of Government Autonomous College, Phulbani

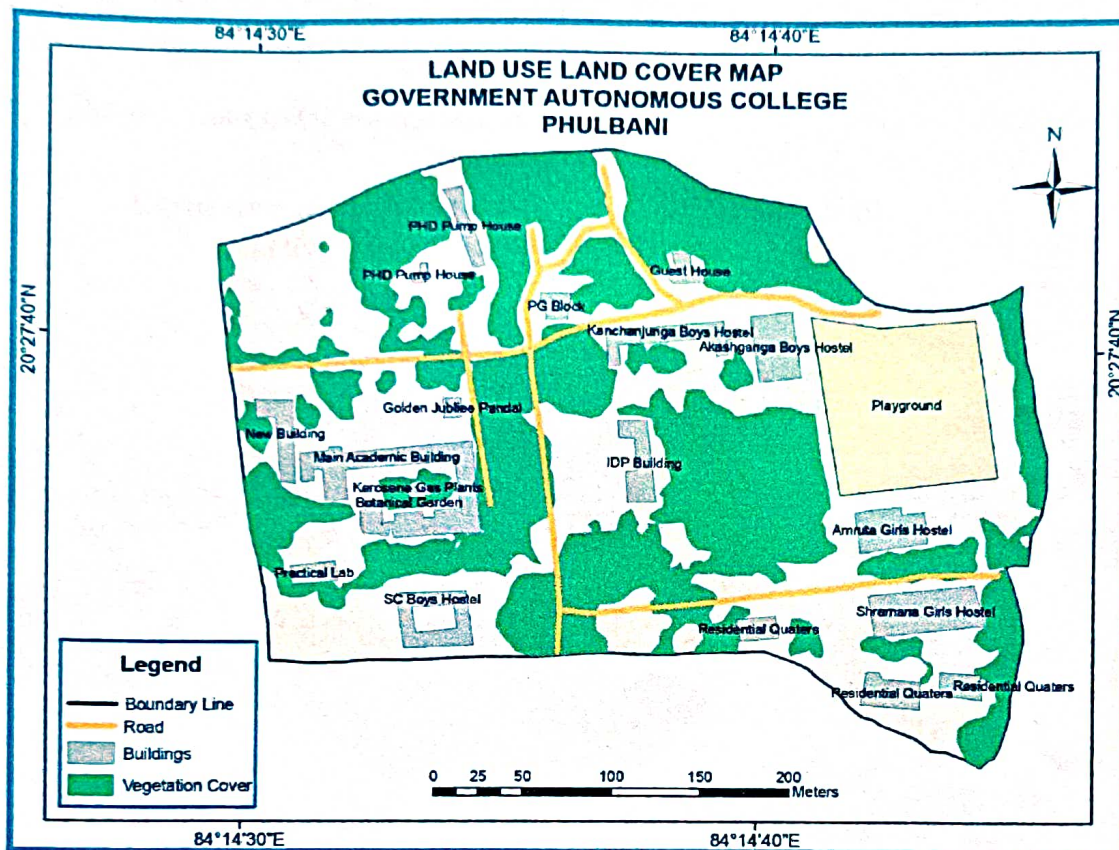
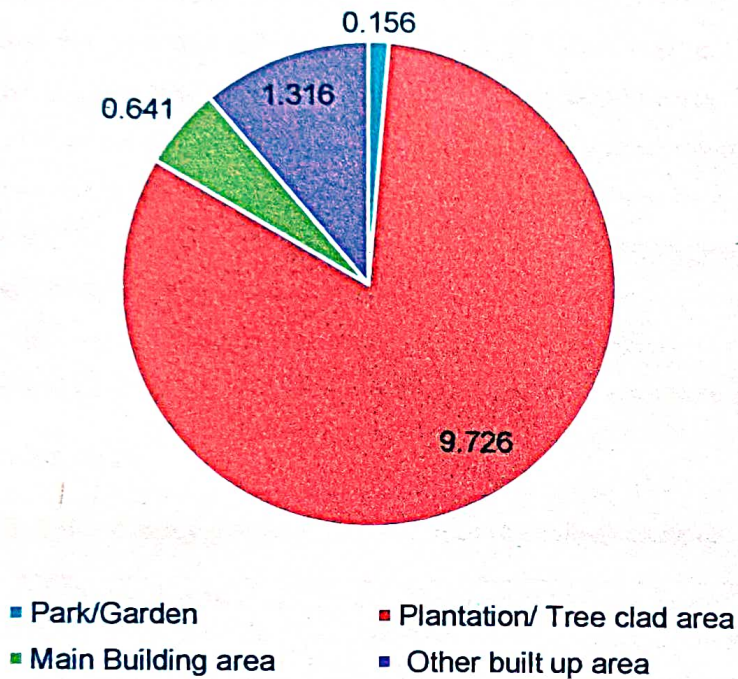


Table 1. Land use Land Cover area (ha) of college campus

Land use	Area(in ha)	Area (in acre)
Park/Garden	0.0631	0.156
Plantation/ Tree clad area	3.936	9.726
Main Building area	0.26	0.641
Other built up area	0.533	1.316
Total	4.7921	11.839

Figure 3. Land Use of college campus

Land use pattern and green cover in acres of Govt. (Auto) College, Phulbani



ENERGY AUDIT

Energy was consumed in various process and ways as energy is essential for day to day activities in college campus. Following ways energy was consumed in campus

- Electricity consumption
- Green Cover

Table 2. Total Electricity Consumption (KWH) in the college campus.

SL NO	Location S/S NO	ENERGY CONSUMED IN KWH IN YEAR
1	Common room and Classroom	6512
2	Main Building	21124
3	Hostel complex	18000
4	Residential Complex	42596
5	IDP building	6936
	Total	95168

RENEWABLE ENERGY AUDIT

India is on a path to rapid energy transition, started at a normal pace in 2008 as part of the then announced Climate Change Action Plan for India, with a target of installing 20,000 MW of renewable energy generation facilities including Solar and Wind electricity by 2022. Prime Minister Narendra Modi, after taking over reviewed this target and called upon the people of India to target 175,000 MW of renewable by 2022 – composed of 100,000 MW of Solar PV; 60,000 MW of Wind Power; 10,000 MW of Biomass based power and 5,000 MW of Small Hydro Power and all other renewable energy routes. At the historic 21st UNFCCC (UN Framework Convention on Climate Change) held in Paris in December 2015, India declared its INDC (Intended Nationally Determined Contribution) in which these targets are also explicitly stated. Therefore, it is only natural that through a Green Audit, any Higher Education Institution should identify opportunities for developing Renewable Energy (RE) Sources within its own premises.

The College has identified the following renewable energy development options for the campus:

SOLAR ENERGY

Table 3. Solar Energy production pattern of the college campus.

Installations in Departments/Hostels	Number of solar panel	Power in WH in year	Total in KWH per annum
Shramana Ladies Hostel	35 × 300W	10500 × 2400	25200
Street Light	55 × 40W	2200 × 2400	5280
Grand Total =			30,480

Undoubtedly, the sun is a powerful energy source, and even though we are not able to collect a fraction of this energy, yet harnessing this power by installing solar panels can make a significant difference to the planet. While it has been widely criticized for being expensive or inefficient, solar energy has now proved to be extremely beneficial - not only for the environment but also for the private economy.

The installed capacity of solar panels in the TheCollege campus is quite good and it contributes a significant quantity of energy need of the college. Apart from the maintenance challenges, the capacity building of the photovoltaic installation in the future may improve the carbon footprint of the campus.

Figure 4. Solar installations of the college campus.



BIODIVERSITY AUDIT

The campus of the Government Autonomous College, Phulbani experiences sub tropical hot and dry climate in summer. Dry and cold climate in winter. The maximum temperature recorded in the District is 45.5 °C and minimum temperature is 2.0 °C. The average annual rainfall recorded is 1522.95 mm. The Kandhamal district covering a geographical area of 7654 sq kms is bounded by Boudh district in the North, by Rayagada & Gajapati districts in the South, by Ganjam and Nayagarh districts in the East and Kalahandi District in the west. The campus has a good patch of natural forest having a major tree species like *Tectona grandis*, *Dalbergia sissoo*, *Madhuka indica*, *Acacia catechu*, *Shorea robusta* etc. Plantation activities are usually undertaken during rainy season and Nationally important days like 15th August, World Environment Day, World AIDS Day, Banomahostav etc. Accordingly many new species of economic and medicinal importance such as Ashoka, Jacrenda, Neem, Ficus etc, have been introduced. Some herbs and shrubs were also planted in the campus.

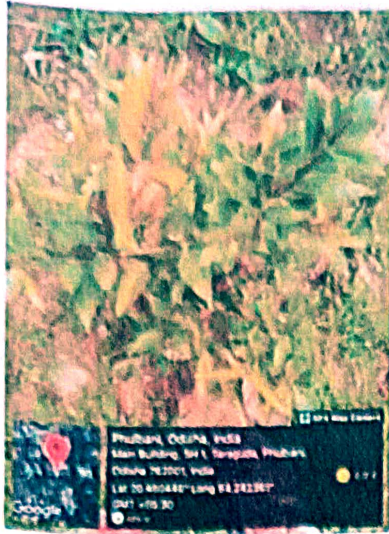
Table 4. Flora diversity of TheCollege campus.

Sl No.	Common name	Scientific name
1.	Persimmon	<i>Diospyros sp.</i>
2.	Tree of Haven	<i>Simarouba glauca</i>
3.	Croton	<i>Codiaeum variegatum</i>
4.	Areca Palm	<i>Areca sp.</i>
5.	Hedge plant	<i>Duranta erecta</i>
6.	Aparajita	<i>Clitoria ternatea</i>
7.	Banana	<i>Musa paradisiaca</i>
8.	Madhumalati	<i>Quisqualis indica</i>
9.	Gambhari	<i>Gmelina arboria</i>
10.	Harida	<i>Terminalia chebula</i>
11.	Kendu	<i>Diospyros melanoxylon</i>
12.	Kusum	<i>Schleichera oleosa</i>
13.	Mahula	<i>Madhuca indica</i>
14.	Mango	<i>Mangifera indica</i>
15.	Teak	<i>Tectona grandis</i>
16.	Neem	<i>Azadiracta indica</i>
17.	Sal	<i>Shorea robusta</i>
18.	Sana chakunda	<i>Samanea saman</i>
19.	Bada chakunda	<i>Cassia siamea</i>
20.	Panasa	<i>Artocarpus heterophyllus</i>
21.	Krushnachuda	<i>Delonix regia</i>
22.	Radhachuda	<i>Peltophorum ferrugineum</i>
23.	Cadamba	<i>Neolamarkia cadamba</i>
24.	Dimiri	<i>Ficus racemosa</i>
25.	Bara	<i>Ficus bengalensis</i>
26.	Pipali	<i>Ficus religiosa</i>
27.	Debadaru	<i>Polyalthiya longifolia</i>
28.	Barakoli	<i>Ziziphus mauritania</i>
29.	Guava	<i>Psidium guajava</i>
30.	Cashew nut	<i>Anacardium occidentale</i>
31.	Arjuna	<i>Terminalia arjuna</i>
32.	Asoka	<i>Saraca asoka</i>
33.	Coconut	<i>Cocos nucifera</i>
34.	Date plam	<i>Phoenix dactylifera</i>
35.	Sago Palm	<i>Cycas revoluta</i>
36.	Kadamba	<i>Neolamarckia cadamba</i>
37.	Chandan	<i>Santalum album</i>
38.	Debadaru	<i>Cedrus deodara</i>
39.	Jack fruit	<i>Artocarpus sp.</i>

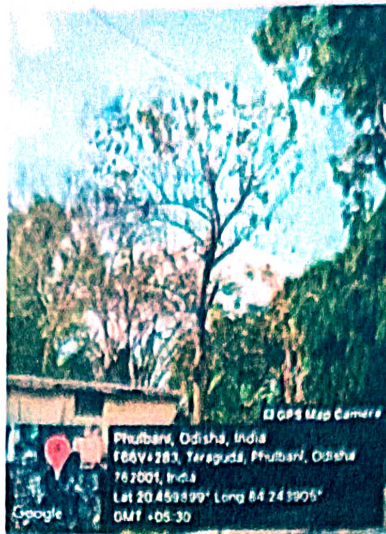
40.	Sirisa	<i>Cassia sp.</i>
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SHRUBS		
41.	Bana tulasi	<i>Perilla ocmoides</i>
42.	Bisalyakarani	<i>Tridax procumbens</i>
43.	Patalgaruda	<i>Raowolfia serpentine</i>
44.	Satabari	<i>Asparagus recemosus</i>
45.	Sabai grass	<i>Eulaliopsis binata</i>
46.	Kia ketaki	<i>Pandanus tectorius</i>
47.	Shirisha	<i>Cassia tora</i>
48.	Mali	<i>Jasminum officinale</i>
49.	Periwinkle	<i>Catharanthus roseus</i>
50.	China rose	<i>Hibiscus rosasinensis</i>
51.	Red Sage	<i>Lantana camara</i>
52.	Elephants' ears	<i>Caladium bicolor</i>
53.	Boat lily	<i>Rhoeo sp.</i>
54.	Palm	<i>Pandanus spirallis</i>
55.	Orange jasmmine	<i>Murraya paniculata</i>
56.	Musakani	<i>Coculus hirstulus</i>
57.	Baula	<i>Mimosups elegni</i>
58.	Bagha Dimiri	<i>Ficus cerica</i>
59.	Nightshade plant	<i>Belladona sp.</i>

HERBS		
60.	Bhuinnimba	<i>Andrographis paniculata</i>
61.	Gheekuanri	<i>Aloe vera</i>
62.	Duba	<i>Cyanodon dactylon</i>
63.	Nut grass	<i>Cyperus rotundus</i>
64.	Crowfoot grass	<i>Dactyloctenium aegyptium</i>
65.	Lajakuli	<i>Mimosa pudica</i>
66.	Bisalya karani	<i>Tridax procumbens</i>
67.	Pumpkin	<i>Cucurbita pepo</i>
68.	Baker plant	<i>Vernonia polysphaera</i>
69.	Chitakuti	<i>Eubhorbia sp.</i>
70.	Keli kadamba	<i>Albigia sp.</i>
71.	Pokasungha	<i>Ageratum conyzoides</i>



Diospyros sp.



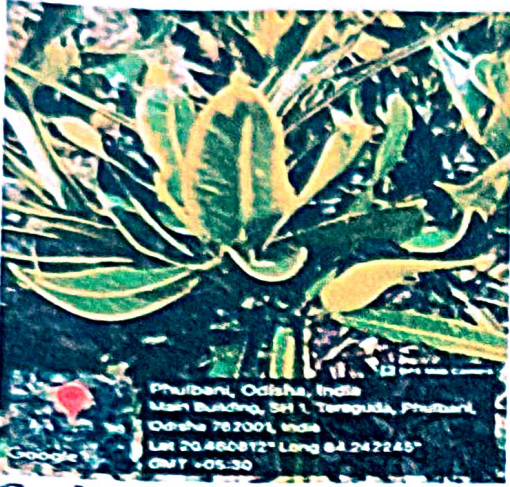
Tectona grandis



Simarouba glauca



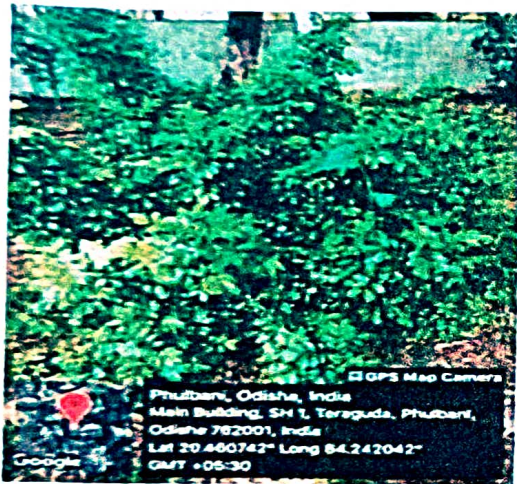
Mangifera indica



Codiaeum variegatum



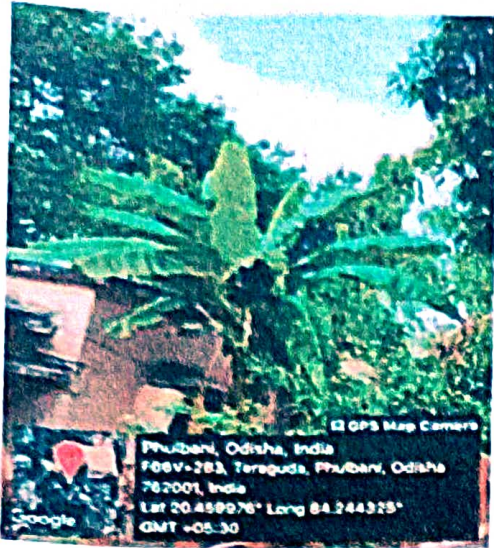
Areca sp.



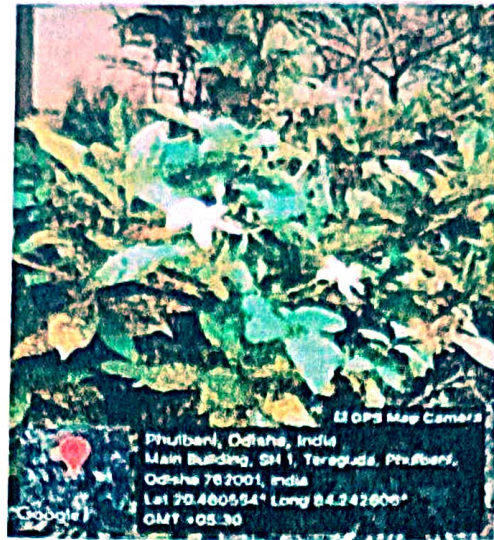
Cestrum nocturnum



Santalum album



Musa paradisiaca



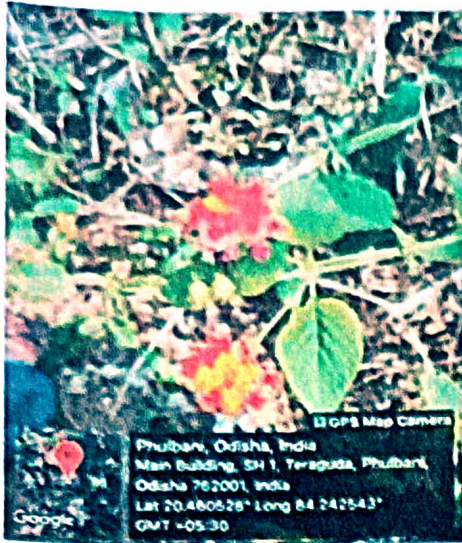
Valeriana wallicii



Quisqualis indica



Antigonon polygonum



Lantana camara



Jasminum officinale



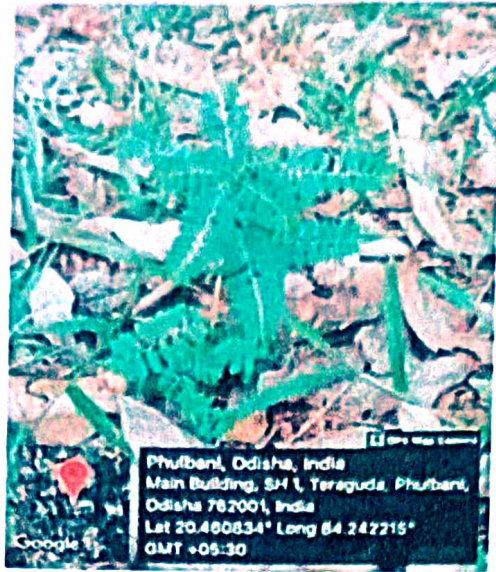
Catharanthus roseus



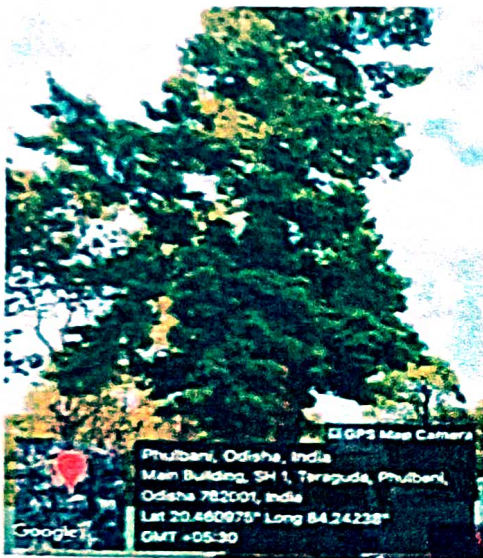
Caladium bicolor



Rhoeo sp.



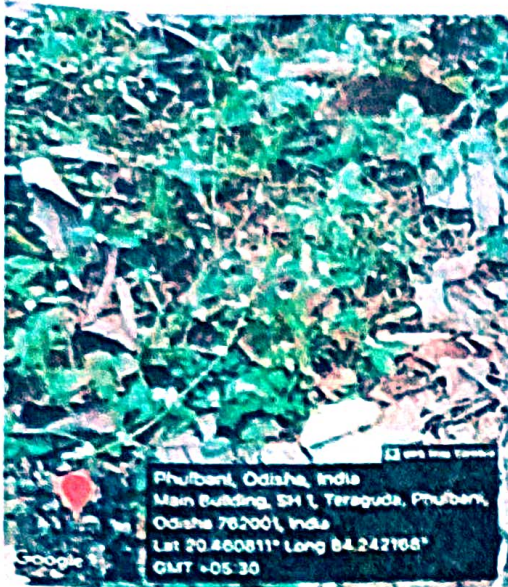
Phyllanthus sp.



Cedrus deodara



Tridax procumbens



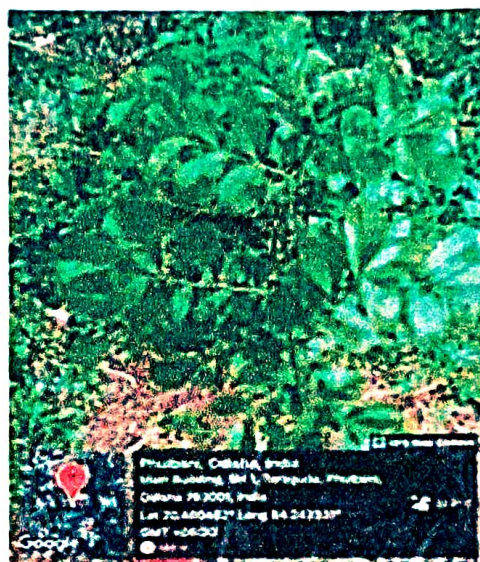
Alternanthera sessilis



Cycas revoluta



Pandanus spirallis



Murraya paniculata



Neolamarckia cadamba



Tabernaemontana divaricata



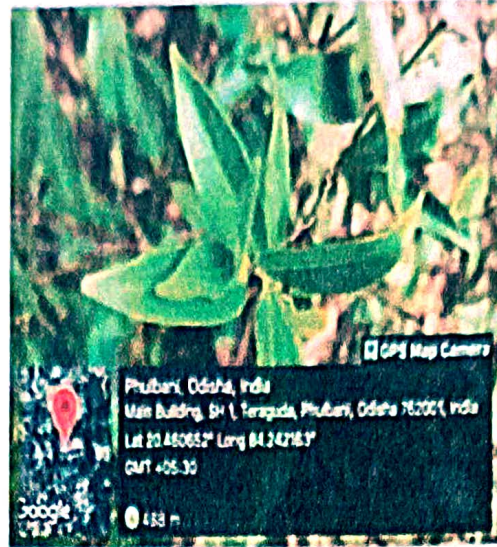
Cassia fistula



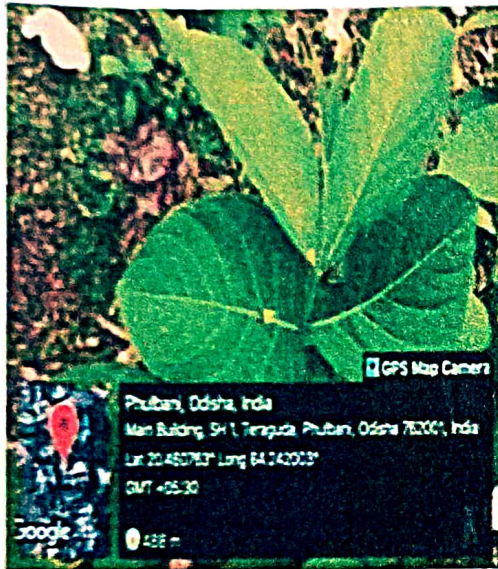
Latania lontaroides



Dyspsis sp.



Aloysia triphylla



Artocarpus sp.



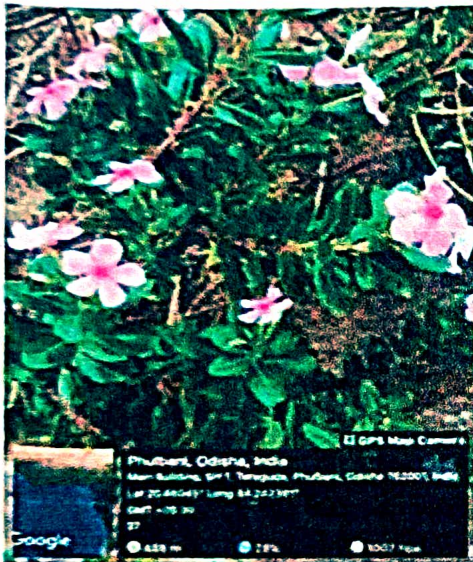
Cucurbita pepo



Acrocarpus flaxinifolius



Vernonia polysphaera



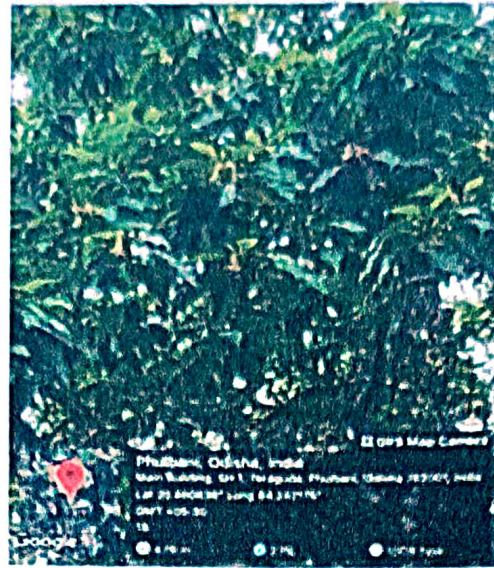
Catharanthus Roseus



Aloe barbadensis



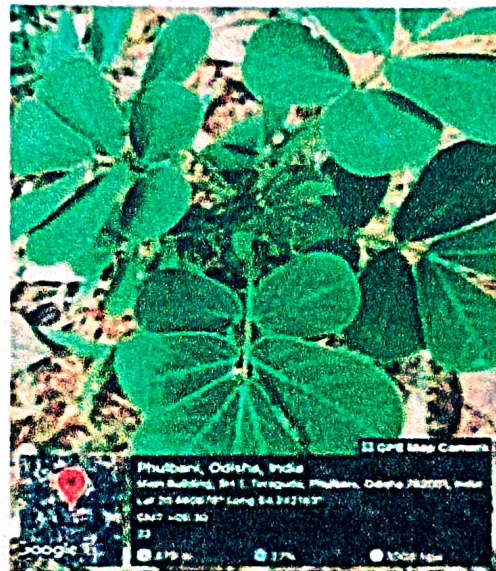
Rhapsis excelsa



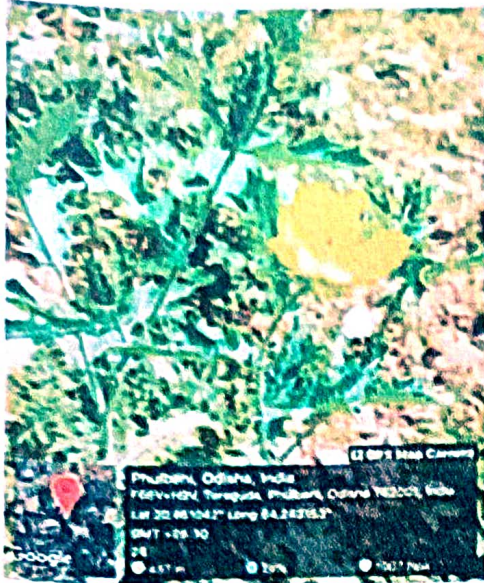
Michelia champaca



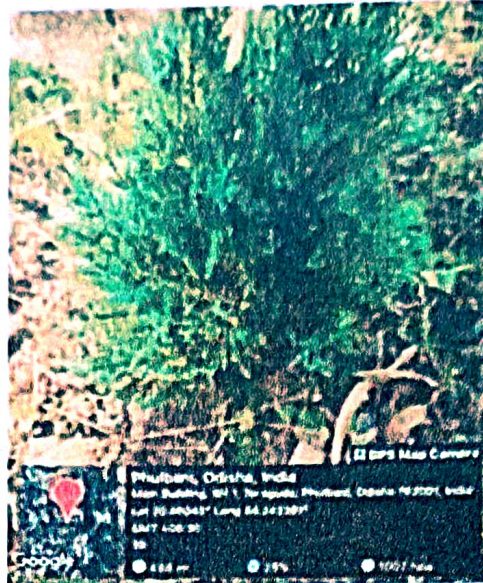
Blumea balsamifera



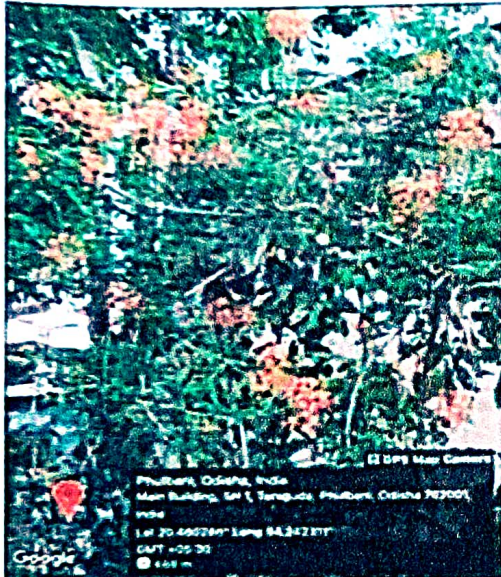
Cassia sp.



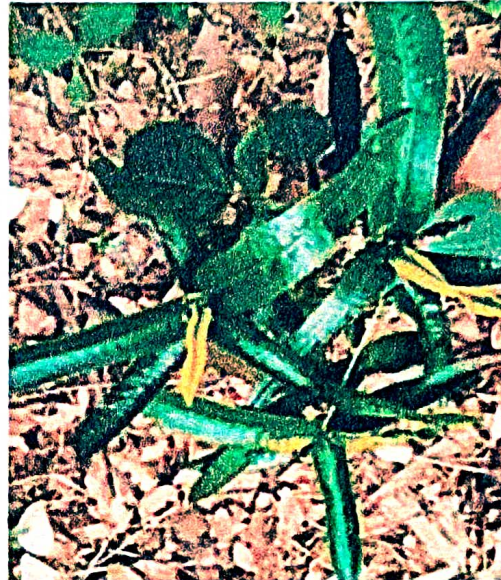
Argemone mexicana



Cupresis sp.



Caesalpinia pulcherima



Hemidesmus indicus



Senna siamea



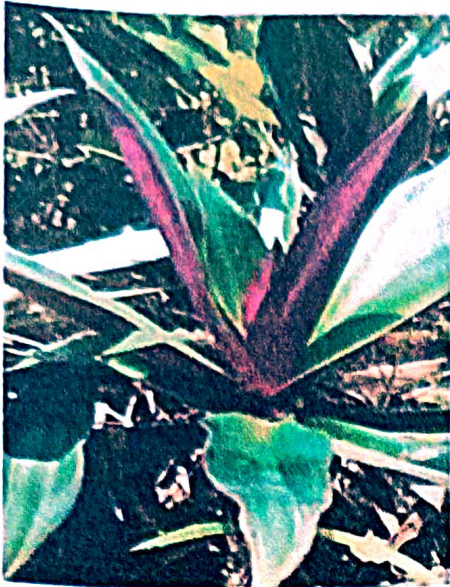
Carapichea ipecacuanha



Codiaeum variegatum



Eucalyptus sp.



Rhoeo discolor



Aloe vera



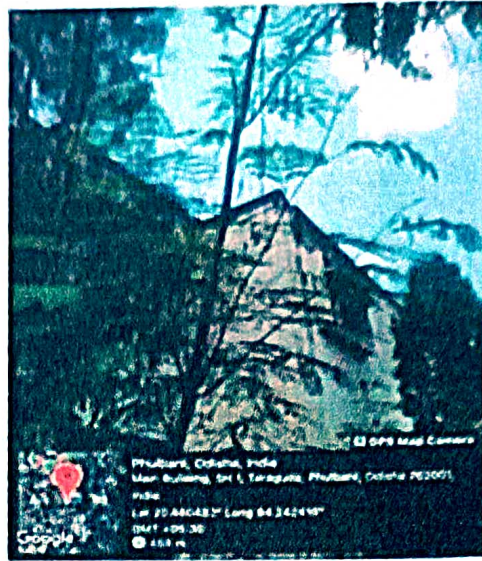
Cupresis sp.



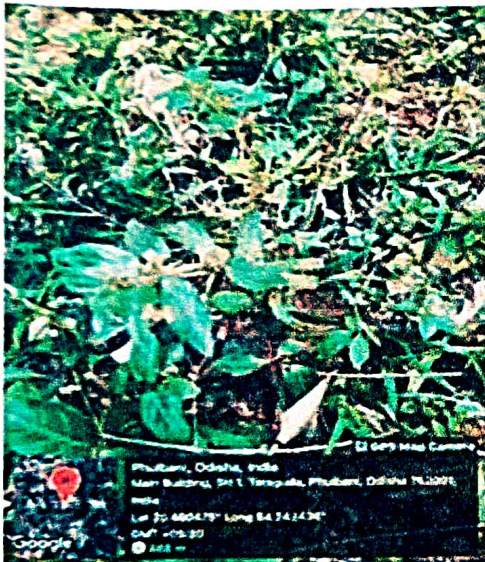
Ficus carica



Bryophyllum pinnatum



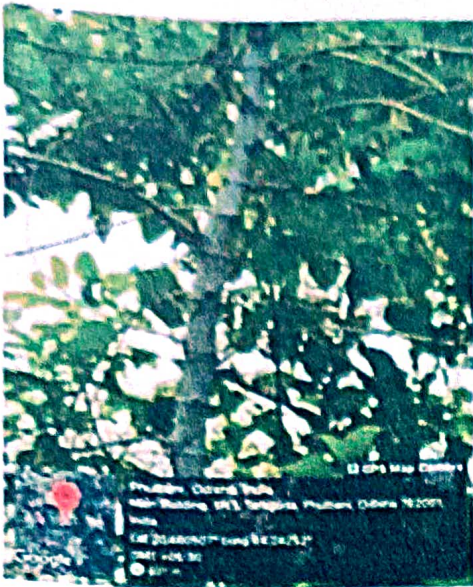
Albizia sp.



Euphorbia hirta



Ageratum conyzoides



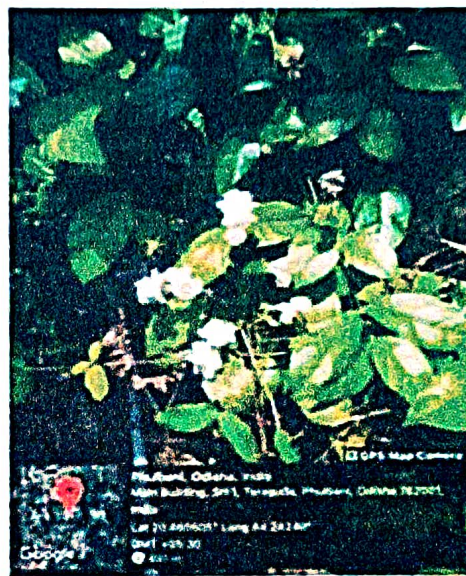
Ficus carica



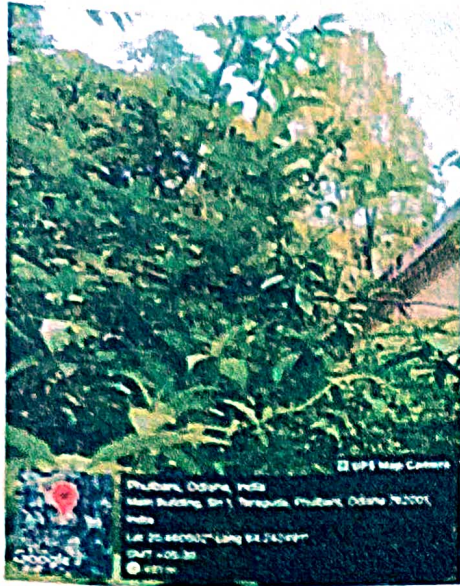
Atropa belladonna



Ficus sp.



Jasminum sambac



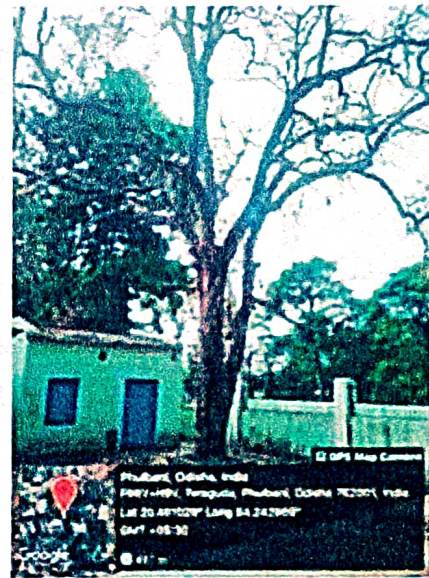
Psidium guajava



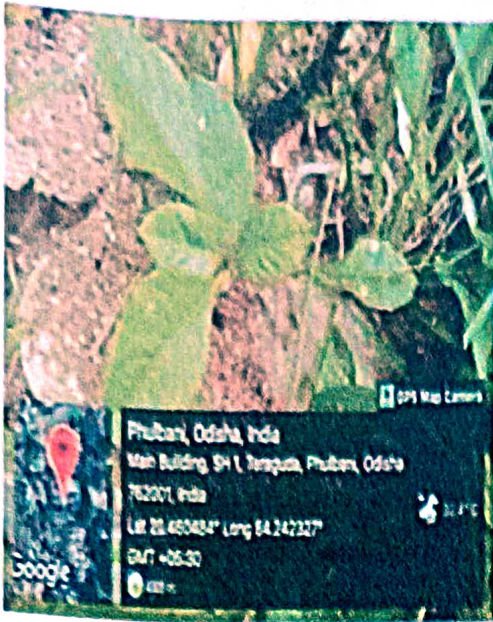
Callistris sp.



Ficus bhengalensis



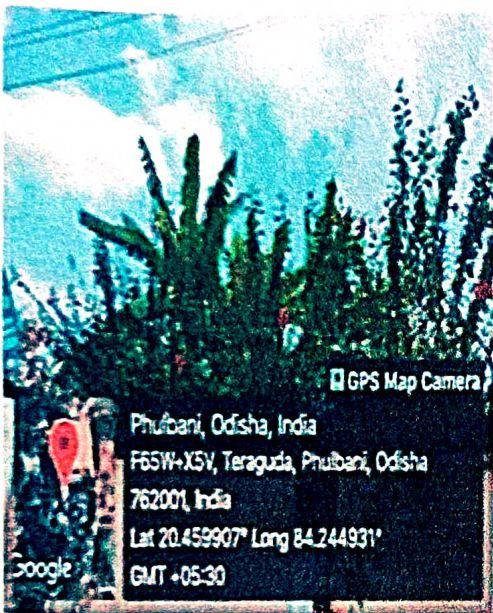
Madhuka indica



Petiveria alliacea



Clitoria ternatea



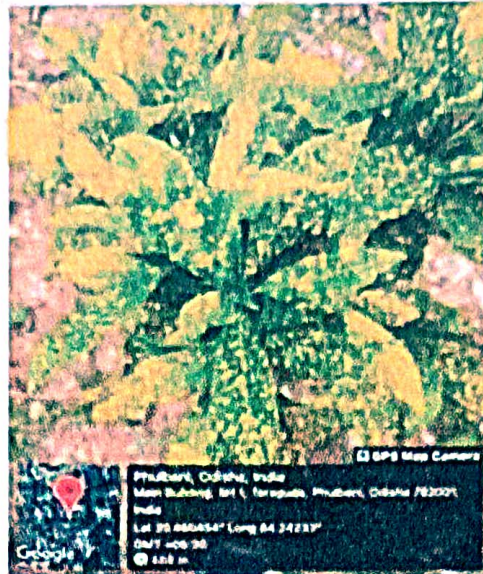
Hibiscus Rosasinensis



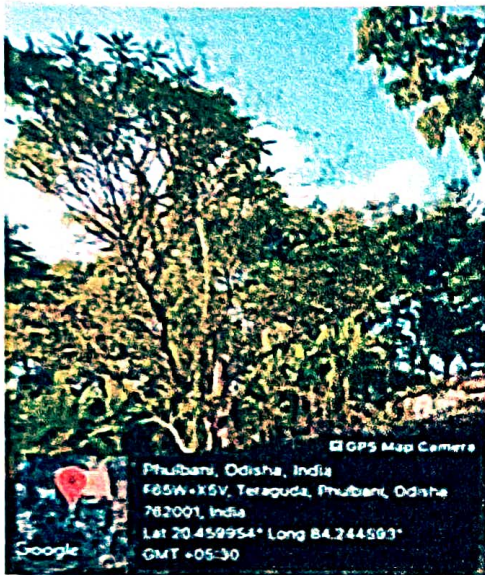
Thelypteris dentate



Mimosa pudica



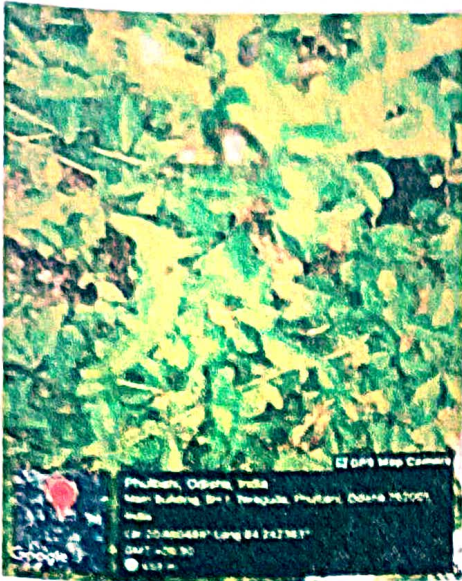
Codiaeum variegatum



Terminalia arjuna



Palaquium formosanum



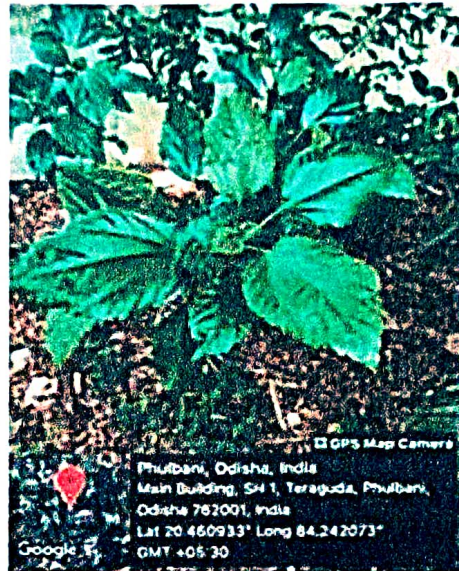
Duranta erecta



Cocos nucifera



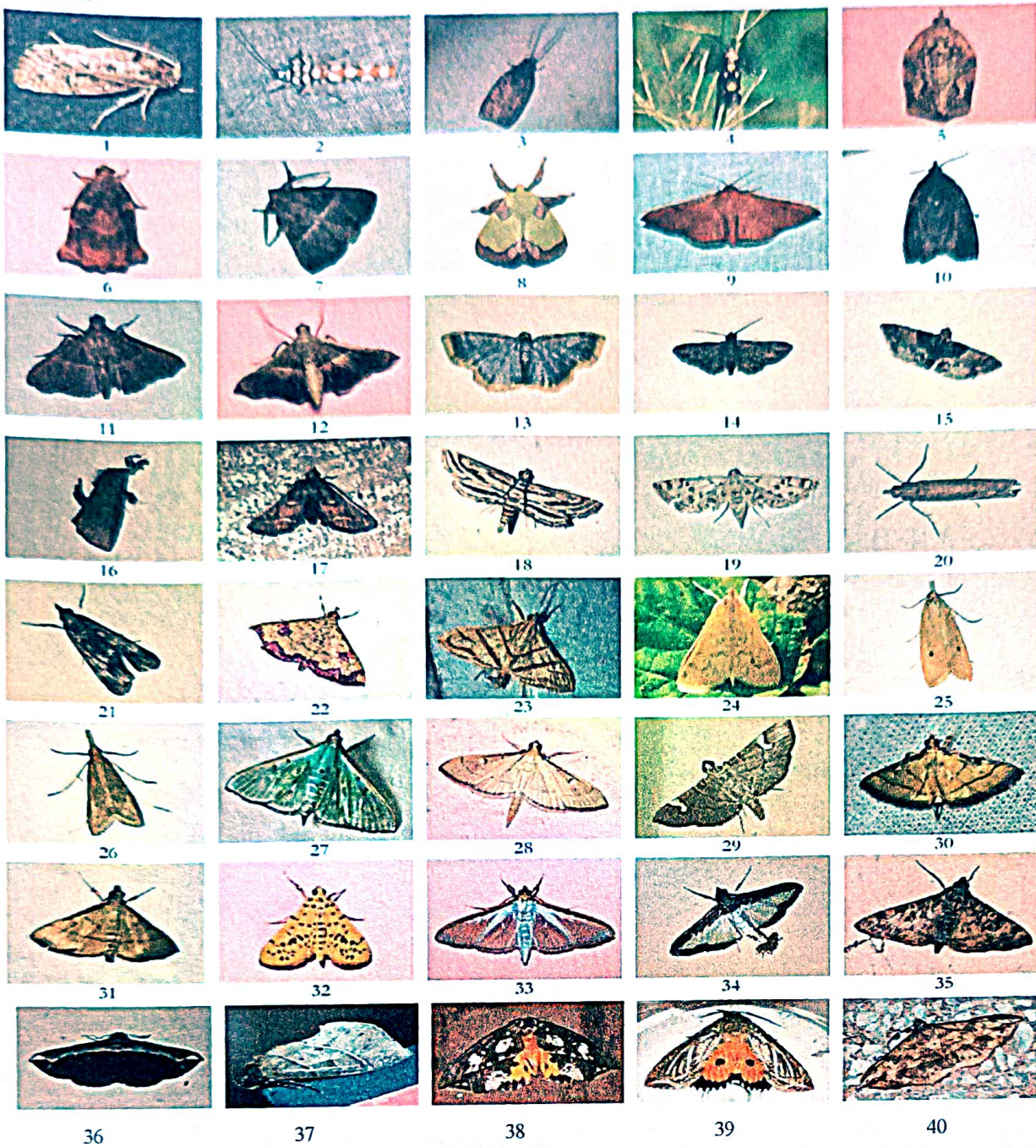
Clausena indica



Hibiscus rosasinensis

Nature has endowed Phulbani with a great variety of flora and fauna wilderness. The rich diversity and sub-tropical hot and dry climatic conditions resulting in a diversified ecological habitat. Our GACP campus got wide range of fauna diversity. A survey was carried out to find the animal diversity in the campus of Government Autonomous College, Phulbani.

Figure 6. Fauna diversity of TheCollege
Moths



1- *Acrolophus* sp.; 2- *Atteva* sp.; 3- *Lecithocera* sp.; 4- *Eretmocera impactella*; 5- *Adoxophyes fasciculana*; 6- *Archips micaceana*; 7- *Aphendala tripartita*; 8- *Parasa* sp.; 9- *Banisia* sp.; 10- *Hyblaea* sp.; 11- *Endotricha mesenterialis*; 12- *Endotricha repandalis*; 13- *Hypsopygia* sp.; 14- *Pyralis marihotalis*; 15- *Pyralis pictalis*; 16- *Sacada* sp.; 17- *Zitha torridalis*; 18- *Parapoynx fluctuosalis*; 19- *Parapoynx stagnalis*; 20- *Ancylolomia* sp.; 21- *Noorda blitealis*; 22- *Isocentris filalis*; 23- *Pagyda salvalis*; 24- *Paliga* sp.; 25- *Scirpophaga incertulas*; 26- *Scirpophaga nivella*; 27- *Arthroschista hilaralis*; 28- *Bradina admixtalis*; 29- *Chalcidoptera appensalis*; 30- *Cnaphalocrocis medinalis*; 31- *Cnaphalocrocis ruralis*; 32- *Conogethes* sp.; 33- *Cydalima laticostalis*; 34- *Diaphania indica*; 35- *Dysallacta negatalis*. 36- *Zurobata vacillans*; 37- *Calyptra* sp.; 38- *Eudocima hypermnestra*; 39- *Eudocima materna*; 40- *Anticarsia irrorata*;

Table 5. Chiropteran Fauna Species of TheCollege

Pteropodidae

Cynopterus sphinx

Pteropus giganteus

Rousettus leschenaulti

Rhinolophidae

Rhinolophus lepidus

Rhinolophus rouxii

Hipposideridae

Hipposideros fulvus

Hipposideros speoris

Hipposideros lankadiva

Megadermatidae

Megaderma lyra

Vespertilionidae

Pipistrellus tenuis

Greater short-nosed fruit bat

Indian flying fox

Fulvous fruit bat

Blyth's horseshoe bat

Rufous horseshoe bat

Fulvous leaf-nosed bat

Schneider's leaf-nosed bat

Kelaart's leaf-nosed bat

Greater false vampire bat

Indian pygmy bat



Pipistrellus entellus



Cynopterus sphinx

Table 6. Reptiles (Snakes) available in The College Campus and about their Oviparity or Viviparity.

Reptiles found in Government Autonomous College, Phulbani

Class: Reptilia				
Sl. No	Local Name	English Name	Family	Scientific Name
1	Jhitipiti	House Lizard	Gekkonidae	<i>Hemidactylus brooki</i>
2	Endua	Garden Gecko	Agamidae	<i>Calotes versicolor</i>
3	Champeo Neula	Common Keeled Skink	Sciencidae	<i>Eutropis carinata</i>
4	Dhanda Sapa	Checked Keelback Snake	Colubridae	<i>Fowlea piscator</i>
5	Matibiradi Sapa	Buff Striped Keelback	Colubridae	<i>Amphiesma stolatum</i>
6	Dhamana Sapa	Rat Snake	Colubridae	<i>Ptyas mucosa</i>
7	Jatia Sapa or Boda	Indian Wolf Snake	Colubridae	<i>Lycodon aulicus</i>
8	Chitti Sapa	Common Indian Krait	Elapidae	<i>Bungarus caeruleus</i>
9	Rana Sapa	Banded Krait	Elapidae	<i>Bungarus fasciatus</i>
10	Naga Sapa	Indian Cobra (Bicellate)	Elapidae	<i>Naja naja naja</i>
11	Tampa Sapa	Mono Cellate Cobra	Elapidae	<i>Naja kaouthia</i>
12	Telia Sapa	Brahminy Blind Snake	Typhlopidae	<i>Indotyphlops braminus</i>

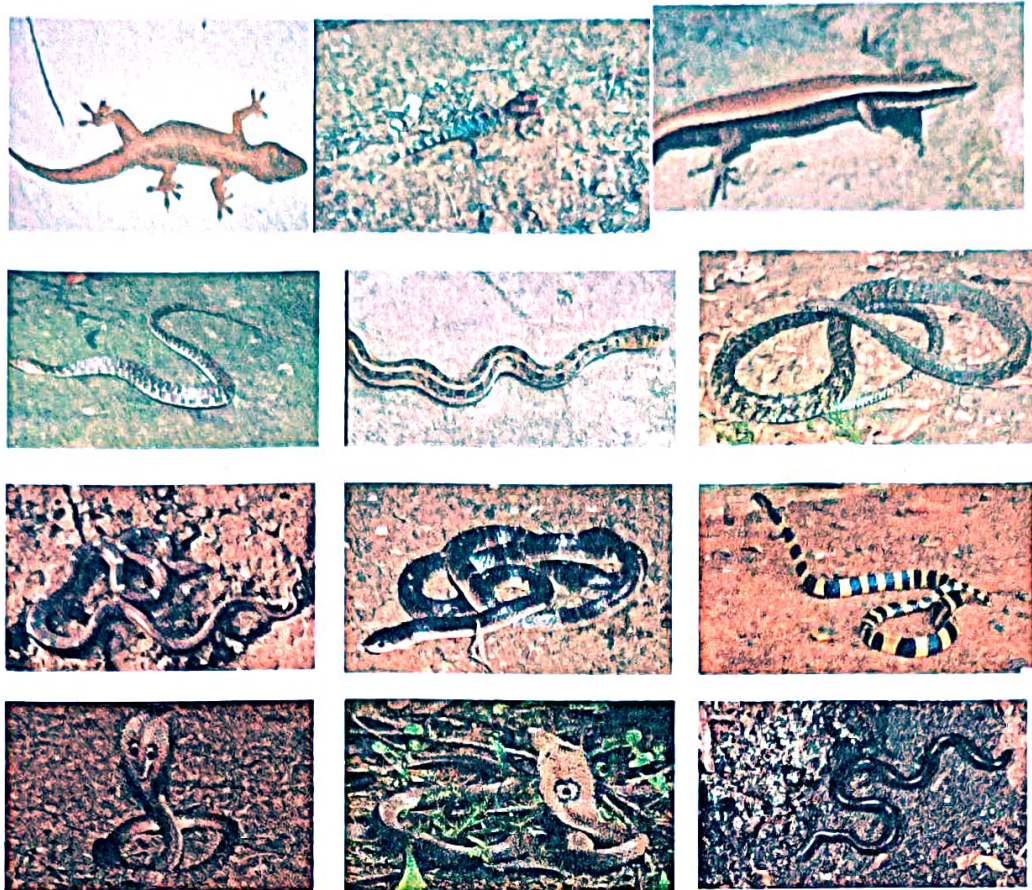


Figure 7: 1- *Hemidactylus brooki* 2- *Calotes vesicolor* 3- *Eutropis carinata*, 4- *Fowlea piscator* 5- *Amphiesma stolatum*, 6- *Ptyas mucosa*, 7- *Lycodon aulicus* 8- *Bungarus caeruleus* 9- *Bungarus fasciatus*, 10- *Naja naja* 11- *Naja kaouthia* 12- *Indotyphlops braminus*

**Table 7. Avian Fauna found in Government Autonomous
College Phulbani, Campus**

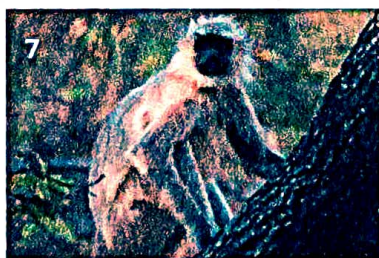
Class: Aves				
Sl. No	Local Name	English Name	Family	Scientific Name
1	Kuwa	Indian Common Crow	Corvidae	<i>Corvus splendens splendens</i>
2	Jungli Kuwa	Indian Jungle Crow	Corvidae	<i>Corvus leuallanti</i>
3	Para	Rock Pigeon	Columbidae	<i>Columba livia</i>
4	Haladibasanta	Black Hooded Oriole	Oriolidae	<i>Oriolus xanthornus</i>
5	--	Redwattled lapwing	Charadriidae	<i>Vanellus indicus indicus</i>
6	Chasa Pakhi	Indian Roller	Coraciidae	<i>Coracias benghalensis benghalensis</i>
7	Sua	Large cylonese parakeet	Psittacidae	<i>Psittacula eupatria eupatria</i>
8	Koili	Indian Koel	Cuculidae	<i>Eudynamys scolopaceus scolopaceus</i>
9	Kumbhatua	Greater Coucal	Cuculidae	<i>Centropus sinensis</i>
10	Kajalpati	King Crow	Dicruridae	<i>Dicrurus macrocercus</i>
11	Shari	Northern Hill Myna	Strunidae	<i>Gracula religiosa intermedia</i>
12	Champa	Odisha Red Vented Bulbul	Pycnonotidae	<i>Pycnonotus cafer</i>
13	Kundakhai	Odisha Jungle Barbler	Muscicapidae	<i>Turdoides striatus orissae</i>
14	Tiki Chadhei	Indian Tailor Bird	Sylviinae	<i>Orthotomus sutorius</i>
15	Gharachatia	Indian House Sparrow	Ploceidae	<i>Passer domesticus indicus</i>
16	Baya Chadhei	Indian Baya Bird	Ploceinae	<i>Ploceus philippinus philippinus</i>
17	Chota Kantia Baga	Indian Pond Heron or Paddy Bird	Ardeidae	<i>Ardeola grayii grayii</i>
18	Rajabani	Indian Myna	Strunidae	<i>Acridotheres tristis</i>
19	Hulhulia Pecha	Barred Jungle Owlet	Stringidae	<i>Acridium radiatumradiatum</i>
20	Baramasi	Indian Spotted Munia	Ploceidae	<i>Amurcia punctulata punctulata</i>
21	Maccharanka	Indian Small Blue Kingfisher	Alcedinidae	<i>Alcedo attahis benghalensis</i>
22	Sundari	Orange Minivete	Campephagidae	<i>Pericrocotus flammeus semiruber</i>



Figure 8: 1-*Corvus splendens* 2-*Corvus leuillanti*3-*Columba livia* 4-*Oriolus xanthornus* 5- *Vanellus indicus* 6-*Coracias benghalensis* 7- *Psittacula eupatria* 8- *Eudynamis scolopacea* 9- *Centropus sinensis* 10- *Dicrurus macrocercus* 11- *Gracula religiosa*12- *Pycnonotu scafer* 13- *Turdoides striatus* 14- *Orthotomous sutorius* 15- *Passerdomesticus*16-*Ploceus philippinus* 17-*Ardeola grayii* 18-*Acridother estristis*19- *Claucidium radiatum* 20- *Lonchura punctulata* 21- *Alcedo attahis* 22- *Pericrocotus flammeus*

Table 8. Mammalian Fauna Found in Government Autonomous College, Phulbani Campus

Class:Mammalia				
Sl. No	LocalName	EnglishName	Family	ScientificName
1	Musa	HouseRat	Muridae	<i>Rattus rattusarboreus</i>
2	Chuchundra	HouseShrew	Soricidae	<i>Suncus murinusmurinus</i>
3	Neula	Indian GreyMongoose	Herpestidae	<i>Herpestes edwardsii</i>
4	Hanu Mankada	HanumanLangur	Cercopithecidae	<i>Prebystisent ellusentellus</i>
5	Pati Mankada	RhesusMacaque	Cercopithecidae	<i>Macacamulatta</i>
6	Gunduchi Musaor Patta Musa	Indian PalmSquirrel	Sciuridae	<i>Funambulus palmarumpalmarum</i>
7	Barhaor Jungli Ghusuri	IndianBoar	Suidae	<i>Susscrofa cristanus</i>



CARBON FOOTPRINT

Carbon Footprint is the amount of carbon dioxide released into the atmosphere as a result of the activities of a particular individual, organization, or community. Acceptable definition for carbon footprint greenhouse gases produced directly and indirectly usually expressed in equivalent tons of greenhouse gases (GHGs) in our environment methane, nitrous oxide and ozone.

eCO₂ CALCULATION

eCO₂ is calculated by using following formula (IPCC, 2018)

1. Electricity: Input value(in kwh/Yr)×0.85(Emission Factor)=Output value in(kgof CO₂)
2. Carbon footprint =Output value in(kgof CO₂)

Table 9. Sectoral carbon footprint of the the College campus

Sectors	Input value	Emission Factor	eCO ₂ Kg
Electricity	95168kwh	0.85	80892.8

Remediation for eCO₂

SN.	Source	Quantity	Conversion Rate	Reduction in eCO ₂ (in kg)
1	Green Cover			
	Tree clad area/Plantation	3.936 ha	3408	13413.88
	Park/Garden	0.0631 ha	2200	138.82
2	Renewable Energy			
	Solar Panel	25200 kWh	0.85	21420
	Solar Streetlight	5280 kWh	0.85	4488
Total carbon offset =				39460.7

Note. Net carbon footprint is 41432.1 kg of eCO₂ in terms of electric energy consumption. The per capita carbon footprint 42.934 kg of eCO₂(Considering the approx. population of the campus 965).

ENVIRONMENTAL AWARENESS

Government Autonomous college, Phulbani conducts plantation drives, cycle rallies in the campus during important events and commemorative days in the college. A campus beautification committee also created at college level for environmental conservation dealing other environmental issues.

The college staff is aware of the various environmental issues and the various green measures to be adopted in office as well as in their houses.

Theme based World Environment Day observation, Ban of single use plastics, restricted entry of automobiles and promotion of electric vehicles in campus etc. are a few campaigns to create environmental awareness.

MITIGATION AND MANAGEMENT PRACTICES

At present following practices for environmental protection are also being adopted by the college:

Plantation Drives: Plantation drives are regular activities in the campus, and usually in all important occasions, plantation activity is taken up. College has maintained a garden in which different ornamental plants have been raised.

Organic Composting: The activity of making organic compost has been initiated in the campus where all the biodegradable waste materials are filled up in the compost pit. In the course of time, organic compost is prepared. This organic compost is utilized for maturing in flower beds and plantations.

Energy Conservation efforts: College is using star rated Electrical & Electronics equipment which saves energy. LED Bulbs/ Tube-light, 4-5 star Rated Air Conditioners. College has always been effortful in making use of renewable energy resources

Water Conservation Measures through Water Harvesting Tank: Globally, our water resources are depleting each year. Additionally, we cannot generate artificial water and must depend on water sources available on our planet earth. In this context, to reduce dependency of water from tube-well and also to recharge underground water resources, the college adopted one of the simplest and best measures for conserving water. The college had created a *rain water harvesting tank* in the campus. It is a simple strategy by which rainfall is stored for future usage. The process involves collection and storage of rainwater with help of artificially designed systems, that runs off natural or man-made catchment areas e.g. rooftop, compounds, rocky surface, artificially repaired impervious/semi-pervious land surface. The collected rainwater from surfaces on which rain falls may be filtered, stored and utilized in different ways or directly used for recharge purposes. This simple water conservation method can be a boost to an incredible solution for water conservation in the campus. It provides the most sustainable and efficient means of water management.

SWOT ANALYSIS

SWOT, the four-letter acronym for the four parameters that this analysis examines, is very common in management studies to identify strengths, weaknesses, opportunities, and threats related to project planning or running an initiative like a business, industry or campaign. Strengths and Weakness are actually internal traits of the institution or the person, and Opportunities and Threats arise from the external environment. And, all these influences the intended activity.

- Strengths are aspects of the initiative that will give it some positive advantages
- Weaknesses are factors that will adversely affect progress of the project
- Opportunities are the exploitable windows helpful for the success of the initiative
- Threats are elements in the environment that could cause trouble for the project

SWOT approach was introduced originally at the Stanford Research Institute, USA, during the 1960s. For community work and educational activities, it can be useful as a tool to identify positive and negative factors within the organization that will promote or inhibit successful implementation of social services and social change activities. The SWOT analysis for any activity, however, is only an initial part of the planning process and is not a tool that will give a final solution. Here, the objective is to find out the shortest route for bringing down the carbon footprint of the education institution, and for making it possible to achieve carbon neutrality.

Strengths and Weaknesses (These are internal - within the organization- factors)

Humanresources : Staff, students, volunteers, PTA, nearby NGOs, public

- Physical resources : One's location, land, building, equipment
- Financial : Grants, funding agencies, other sources of income
- Activities and processes : Green Protocol, programs run, services being rendered
- Past experiences : Learning tools, reputation of the College in the community

Opportunities and Threats (These are external – group/community/societal – factors)

What is in the horizon and awaited shortly?

- The economy : Own, local, national, or other
- Funding sources : Own, donors, governments, subsidies and incentives
- Demographics : Change of players like students& staff joining and leaving Physical environment : Location sensitivities, political support, public opinion
- Legislation : Change in government policies, regulatory controls, rules
- That can either support or destroy the initiative.


SUMMARY BY GREEN AUDIT TEAM


Green audit of any academic institution reveals, ways by which institute can reduce energy consumption, water use and reduction in emission of carbon dioxide in the environment. It is a process to look into and ask ourselves whether we are also contributing to the degradation of the environment and if so, in what manner and how we can minimize this contribution and bring down to zero and preserve our environment for future generation.


This process of green audit enables us to assess our life style, action and assess its impact on the environment. Green auditing is the process of identifying and determining whether institutional practices are eco-friendly and sustainable. Traditionally, we are good and efficient users of natural resources. But over the period of time excess use of resources, viz., energy, water, chemicals are become habitual for everyone especially, in common areas. Now, it is necessary to check whether our activities are consuming more than required resources? Whether we are handling waste carefully? Green audit regulates all such practices and gives an efficient way of natural resource utilization. In the era of climate change and resource depletion it is necessary to verify the processes and convert it in to green and clean one.


- As an outcome effort will be made to reduce carbon footprints by using electrical vehicles, solar power, electrical vehicles in the campus, and green computing in the administration and examination.
- Focus to assess the consumption of energy, electricity, water as well as disposal of liquid waste, solid waste, hazardous waste, e-waste and an inventory of trees in the campus is also prepared to check how much CO₂ is sequestered.
- Various awareness programmes will be helpful to motivate all the staff members for optimized sustainable use of available resources.
- The long-term goal of the environmental audit program is to collect baseline data of environmental parameters and resolve environmental issue.
- The Green Audit Report on environment must reach the public so that it would succeed in reducing the environmental issues and its popularization among stakeholders.
- We try our best to publish green audit report to be published annually by the college.



(S. Acharya)


(S.K. Behera)


(M. Sethi)


(P. Pattanaik)


(J. Mahanta)


(S. Baharsingh)

GREEN AUDIT CERTIFICATE

This Green Audit has been conducted for the College in accordance with the International Standards for ISO 14000 series of standards set by ISO TC 207 and its sub-committees, IPCC, Bureau of Energy Efficiency standards, and stipulations under the Energy Conservation Act 2003 of Government of India and other relevant mandates for promotion of sustainable living and education in a healthy environment.

In our opinion, the Institution has presented true and up-to-date data on the various aspects of working of this higher education institution before the audit team, and appropriate audit procedures have been completed by the audit team for preparing this report. The assessments and recommendations are based on verified data presented before the team on the situation as they existed at the time of audit.

In order to meet the objectives of the audit, the methodology did combine physical inspection of the campus on several work days and holidays, with analytical reviews of relevant documents and activities, as well as interviews with the Principal, Convener, Green Audit team and selected Staff and students of the College.

This audit is conducted to ensure that a Green Policy is followed and implemented in the campus across all academic and non-academic departments and the body of students undergoing studies in the College, so as to make all stakeholders aware of the need for individual efforts in perpetuating green living habits among the people of our country. Green Audit Report 2021 has found that the institution's **per capita carbon footprint is about 0.0429 ton of CO₂ equivalent per annum**, a level far below the national average, with status as Green and a commitment to continue its green practices with approved remediation practices also in position.


Sri Prasant Kumar Patel, IFS, DFO, Phulbani Forest Range,
Phulbani Forest Range, Odisha

Sri Prasant Kumar Patel, IFS, DFO, Phulbani Forest Division, Odisha



Sri Satrugan Mohanty, Formerly Forest Range officer, Phulbani Forest Division, Odisha

I agree with the data presented in this report, as true, and further express my willingness to implement the recommendations of this audit report after internal review, even if any or many of them are in excess of the relevant mandates.



Sri Panchanan Behera, Principal, Government Autonomous College, Phulbani

[seal] *Principal*
Govt. Auto. College,
Phulbani

Green Audit Compliance Statement

Overall Objective	Main Objectives	Compliance Status
Ensure that a Green Policy is formulated, enforced and reviewed	1. Ensure that there is a competent Green Officer from an external agency, who will provide guidance on Environmental Impact studies	Included
	2. Ensure that the Green Policy/ Protocol is reviewed annually, progress monitored and achievable and measurable targets set for the future course	Ensured
	3. Ensure that the Green Policy is enforced, regardless of whether it exceed mandates of the law	Enforced
	4. Ensure that every member of staff and student community commits to the greening of the campus	Commitment ensured
	5. Ensure that Green Audit is conducted annually, action taken on the basis of its reports and recommendations given under them	Green Audits conducted and actions taken on its recommendations

Sri Prasant Kumar Patel, IFS, DFO, Phulbani Forest Division, Odisha


Range Officer,
Phulban Forest Range,



Sri Satrughan Mohanty, Formerly Forest Range officer, Phulbani Forest Division, Odisha

GREEN AUDIT TEAM

Internal member

Teachers

1. Sri Muralidhar Sethi, Dept of Philosophy *MS*
2. Sri Sukanta Ku. Nayak, Dept of Botany *S. Nayak*
3. Dr Srinivas Acharya, Dept of Environmental Science (Convener) *Srinivas*
4. Ms. Jyotirmayee Mahanta, Dept. of Geography (GIS expert) *Jyoti*
5. Dr. Priyabrata Pattanaik, Dept. of Chemistry *P. Pattanaik*
6. Dr. Snigdha Panigrahi, Dept. of Physics *S. Panigrahi*
7. Dr. Subash Pradhan, Dept. of English (Editorial Expert) *S. Pradhan*
8. Dr. Laxman Kandha, Dept. of Botany *L. Kandha*
9. Mrs Lipika Mohanty, Dept of Botany *Lipika*
10. Ms. Sibani Priya Swaro, Dept. of Zoology *S. Swaro*
11. Mrs. Susmita Mohapatra, Dept. of Zoology *S. Mohapatra*
12. Ms. Smruti Joshi, Dept. of Botany *S. Joshi*
13. Ms. Barsha Rani Prusty, Dept of Botany *B. Prusty*
14. Sri Amit Ku. Behera, Jr. Librarian (Data curation) *A. Behera*
15. Mr. Kanhu Ch. Biswal, Accounts Section (Data curation) *K. Biswal*

Student Volunteers

1. Sumanshree Acharya
2. Anwasha Nayak
3. Sushree Sunayana Sahoo
4. Shayali Satyabhama Mahakul
5. Sradhanjali Sahoo
6. Aditya Prasad Satapathy
7. Rudra Madhav Nayak
8. G Rahul Dora
9. Shreetam Nayak
10. Gokula Nayak
11. Sumanta Kanhar
12. Bhagirathi Rana

External Expert member

1. Sri Prasant Kumar Patel, IFS, DFO, Phulbani Forest Division, Odisha
2. Sri Satrughan Mohanty, Formerly Forest Range officer, Phulbani Forest Division, Odisha

PHOTO GALLERY

