

KARNATAK



UNIVERSITY

DHARWAD



**GREEN AUDIT REPORT
2020-21**

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ACCREDITATIONS / CERTIFICATIONS
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ISO 9001:2015
OHSAS 18001 : 2007
MoEF & CC, New Delhi
ISO/IEC 17025:2017 (NABL ACCREDITED)

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NTLR/ KUD/ 2021-22/

Date : 27-12-2021

GREEN AUDIT COMPLIANCE CERTIFICATE

We certify that compliance certificate is based on the Site Visits / On – site survey / Data collected / Data Acquired. University has submitted all the data for verification. Evaluation for the year 2020-21 has been based on the scope available for development of green practices already adopted by the Karnataka University.

The green audit has been conducted from Dec 18th to Dec 24th 2021.

Green Practices adopted by the University are commendable.



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Certifications

Ministry of Environment, Forests and Climate Change, New Delhi
National Accreditation Board of Laboratories, New Delhi (ISO 17025 - TC 6990)
ISO 9001 : 2015
ISO 45001 : 2018
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CONTENTS

- 1 Waste management
- 2 Solid Waste audit
- 3 Water and wastewater audit
- 4 Biohazard waste audit
- 5 E-waste Audit
- 6 Energy audit
- 7 Flora of Karnatak University, Dharwad
- 8 Fauna of Karnatak University Campus
- 9 Glimpse of KUD's Green initiatives

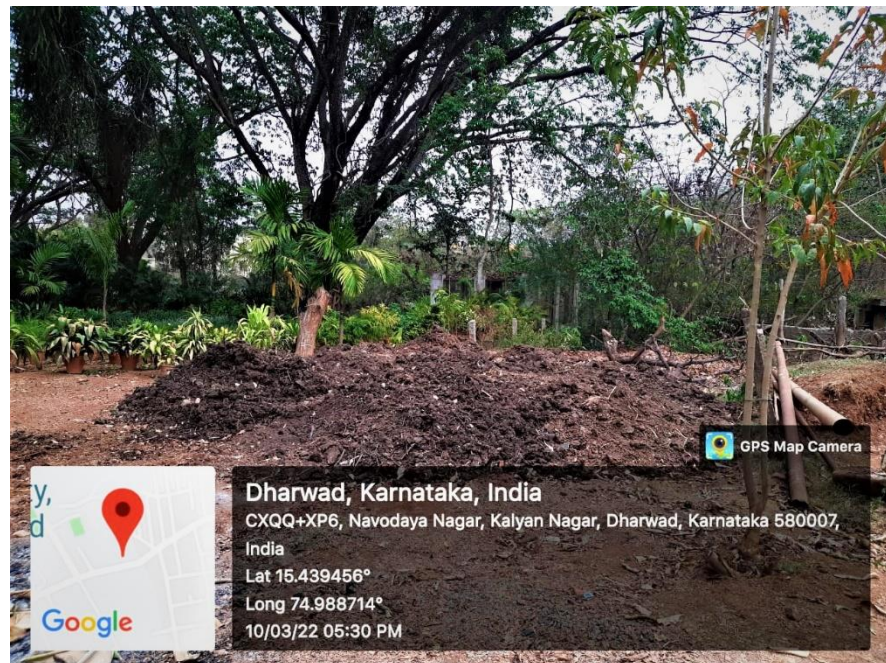
1) WASTE MANAGEMENT

The Karnatak University, Dharwad conducted a “Green Audit” of Karnatak University campus, Dharwad in the academic year 2020-21. Green auditing is the process of identifying and determining whether institutions practices are eco-friendly and sustainable. The main objective to carry out green audit is to check green practices followed by university and to conduct a well formulated audit report to understand where we stand on a scale of environmental soundness.

This is first attempt of Karnatak University, Dharwad to conduct green audit of university campus. Questionnaires were prepared for solid waste (paper waste, plastic waste, glass waste biomedical waste etc), hazards waste (Chemical waste), water waste and e-waste. For audit purpose and suitability analysis of data the study area is grouped as Building Block A including administrative buildings, Building Block B including Science and Technology Departments, Building Block C including Language and Humanities departments and Building Block D including Support Services. The audit was carried for solid waste, chemical waste, e-waste, water and wastewater. It also lists green initiatives taken by university to save environmental resources. The “Green Audit” also gives a “Environmental Management Plan”.

2) SOLID WASTE AUDIT

Solid waste generation and management is a burning issue. Unscientific handling of solid waste can create threats to everyone. The solid waste audit focused on volume, type and current management practice of solid waste generated in Karnatak University campus. The



solid waste collected was paper waste, plastic, biodegradable waste, biomedical waste,

construction waste, glass waste and other miscellaneous waste. The total solid waste collected in the campus is around 4200. kg/month and 50,400 kg/year.

Paper waste is a major solid waste generated by all the departments. Old answer sheets, old bills and confidential reports are sent for shredding, pulping and recycling after completion of their preservation period. Plastic waste is generated by all departments, administrative sections as well as support services but it is not categorized at point source and sent for recycling. Metal and waste are stored and given to authorized vendors for further processing. Few glass bottles are reused in the laboratories and sent to recycling. Biodegradable waste is used for composting at horticulture department of university.

3) WATER AND WASTEWATER AUDIT

Water which is precious natural national resource available with fixed quantum. The availability of water is decreasing due to increasing population of nation, as per capita availability of utilizable water is going down. Due to ever rising standard of living of people, industrialization, urbanization, demand of fresh water is increasing day by day. The unabated discharge of industrial effluent in the available water bodies is reducing the quality of these ample sources of water continuously. Hence, the national mission on water conservation was declared by the Hon'ble Prime Minister Narendra Modi as 'Jal Shakti Abhiyan' and appealed to all citizens to collectively address the problem of water shortage, by conserving every drop of water and suggested for conducting water audit for all sectors of water use.

Water audit can be defined as a qualitative and quantitative analysis of water consumption to identify means of reducing, reusing and recycling of water. Water Audit is nothing but an effective measure for minimizing losses, optimizing various uses and thus, enabling considerable conservation of water in irrigation sector, domestic, power and industrial as well. A water audit is a technique or method which makes possible to identify ways of conserving water by determining any inefficiencies in the system of water distribution. The measurement of water losses due to different uses in the system or any utility is essential to implement water conservation measures in such an establishment.

Importance of Water Audit

- Universal demand
- Systematic process
- May yield some surprising results
- Easier to work on solutions when the problems are identified.
- A tracking mechanism can be put into place.

It is observed that a number of factors like climate, culture, food habits, work and working conditions, level and type of development, and physiology to determine the requirement of water. The community which has a population between 20,000 to 1,00,000 requires 100 to 150 liters per person (capita) per day. The communities with a population can consume over 1, 00,000 requires 150 to 200 liters person (capita) per day. As per the standards provided by WHO Regional office for South East Asia Schools require 2 liters per student; 10-15 liters per student if water-flushed toilets, Administration requires (Staff accommodation not included) 50 liters per person per day, Staff accommodation requires 30 liters per person per day and for sanitation purposes it depends on technology.

Water usage can be defined as water used for all activities which are carried out on campus from different water sources. This includes usage in all residential halls, academic buildings, on campus and on grounds. Wastewater is referred as the water which is transported off the campus. The wastewater includes sewerage, residence, hall water used in cooking, showering, clothes washing as well as wastewater from chemical and biological laboratories which ultimately going down in sink or drainage system.

In the campus

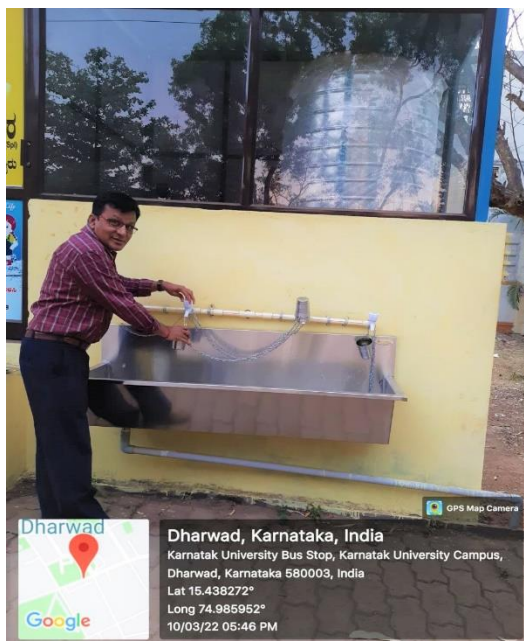
The water used at bathrooms, toilets, laboratory, kitchen, garden and other uses as well as leakages and over flow of water from overhead tanks is also been evaluated. The total use of water is 2500 liters/day. Major loss of water is through leakages less via overflow. The major use of water is in toilets.

Karnatak University in the state of Karnataka, it has rich rain fall

every year three to three and half month and sufficient ground water level, which is self-sufficient in water. There are five tanks and two wells on the campus, among that one



is drinking water with capacity of ten lakh liters (10,000,00 liter) from Hubli-Dharwad municipal corporation (HDMC) which supply water to all the buildings in the campus (includes administrative buildings, Departments, hostels and quarters etc. with separate pipeline), the remaining four tanks which supply water from bore wells for regular use to all building in the campus. For drinking purpose university has set up a Reverse Osmosis Plant (RO Plant) for clean



drinking water for everybody on the campus.

Recycling of water

Wastewater recycling was considered as the best option of water usage. Underlining this fact, Karnatak University has a recycling plant since the university establishment. This recycled water is used for the botanical garden in the campus.

4) HAZARDOUS WASTE AUDIT

Chemical waste

Laboratory Chemical Waste Management

Proper chemical management is necessary to protect the health and safety of the University and surrounding communities and the environment. There are federal and state regulations that require all generators of chemical waste receive training and follow proper waste management and disposal procedures. These regulations have severe monetary and civil penalties associated with them.

Chemical waste is a broad term and encompasses many types of materials. Consult your Material Safety Data Sheet (MSDS), Product Data Sheet or Label for a list of constituents. These sources will tell you if you have a chemical waste that needs special disposal. To reduce its long-term liability, the University is proactive in managing all of its chemical waste in an environmentally sound manner. If there are any questions on whether a material must be managed through the chemical waste management program by contacting EHS department.

Examples of Chemical Waste:

- Unused and surplus reagent grade chemicals
- Intermediates and by-products generated from research & educational experiments
- Batteries
- Anything contaminated by chemicals
- Used oil of all types
- Spent solvents - including water based
- Mercury containing items
- Photographic film processing solutions and chemicals
- Non-returnable gas cylinders
- Non-empty aerosol cans
- Chemically contaminated sharps
- Finely divided powders
- Contaminated syringes, needles, GC syringes, razor blades
- Pasteur pipettes, pipette tips.
- Equipment and apparatus containing hazardous waste
- Ethylene glycol
- Paints - both oil and latex
- Fluorescent light bulbs

- Light ballasts
- Preserved specimens
- Custodial and industrial cleaners
- Uncured Resins (Phenolic, Epoxy, Styrene, etc....)
- Degreasing solvents
- Brake/Transmission/Power Steering Fluids

Liquid Chemical Waste

Once it is determined that chemical waste will be generated, a container must be selected prior to waste generation. For **bulk solvent and aqueous liquid waste streams** use a Low-Density Polyethylene *Nalgene* container. These containers will be returned within a week to the lab and are available from most laboratory supply companies and the campus storerooms. *Nalgene* containers are compatible with most chemical wastes, but there are a few waste streams that should not be accumulated in these containers.

Solid Chemical Waste

Solid waste includes any laboratory material that has come in contact with a chemical or is potentially contaminated with a chemical. Examples include gloves, bench-top paper, weighing boats and papers, paper towels, clean up material and permanently contaminated glassware and plasticware. Go to Laboratory Solid Waste Disposal Procedures for a flow chart that helps decide if a material requires management as chemical waste or if it can be placed in the normal trash. Use the following procedures to manage solid chemical waste:

- Use five-gallon poly pails, cardboard boxes, or other sturdy containers.
- All containers must have lids.
- Apply a completed chemical waste label on the outside of the container or in vinyl tags attached to the containers.
- Line the container with a 7-mil polyethylene bag or three standard trash bags.
- All bags must be sealed unless laboratory personnel are actively adding waste. Seal the bag with a bag closure tie or a large binder clip.
- When the container is full, seal the bag with tape. If the container is in a cardboard box, secure the box with tape as well.

- It is important not to overload containers. Full boxes should not weigh more than 10 kg. Do not use overly large boxes. Only fill boxes two-thirds full if they contain broken glass.

Common Violations Found in Laboratories and Suggestions

Routinely, encounter a group of common problems and issues with chemical waste. These common problems are listed below with suggestions to prevent them from occurring problems.

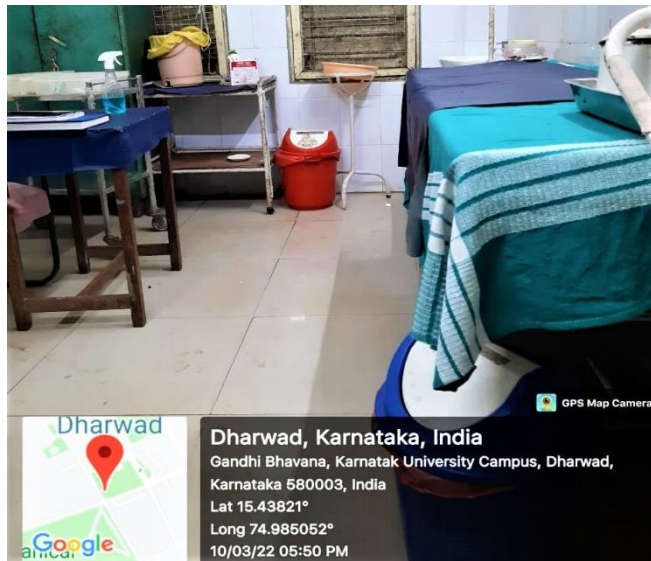
- **Unknown / Unlabeled chemical waste** is very difficult and expensive to dispose of and poses an unnecessary risk to laboratory personnel as well as University personnel handling the waste. Unlabeled containers are a direct violation of the waste regulations.
- **Prevention** - Label all chemical waste with an orange chemical waste label. Update the constituents on the label every time waste is added. Inspect waste on a weekly basis to assure that containers are labeled and that the labels are in good condition. Inspect your chemical reagents to assure that the labels are still attached. Tape or replace as necessary.
- **Mixing or storage of incompatible chemicals** may result in an explosion, fire or generation of toxic aerosols, vapor or fumes.
- **Prevention** - Having an accurate, up-to-date waste label on each container will greatly reduce the possibility of mixing incompatible materials. Store incompatibles away from each other and in separate secondary containment bins.
- **Chemical containers that are left uncapped / open** - This is a direct violation State of chemical waste and air permitting regulations and must not occur.
- **Prevention** - Seal all containers immediately after waste is added. Inspect accumulation areas to assure all containers are sealed. Purchase and use ECO-Funnels.
- **Laboratory personnel that are inadequately trained in the proper management of chemical waste** - This is a direct violation of State chemical waste regulations. Additionally a lack of training places University Personnel, facilities and the environment at risk.
- **Prevention** - Complete EHS' online Chemical Waste training class. Go to Environmental Health & Safety Training Schedule to sign up for a live training session in the EHS Office.

- **Liquid containers stored outside of secondary containers** - If container(s) fail, the contents may migrate and commingle with incompatible chemicals or migrate to floor or sink drains. This is a direct violation of the State chemical waste regulations.
- **Prevention** - Store all liquid chemical waste in secondary containment.
- **Waste Containers Stored In and/or Near Sink Areas and Floor Drains** - If containers leak the contents could discharge down the drain. If this occurs, it is a direct violation of the State chemical waste and safe drinking water regulations.
- **Prevention** - Store all liquid chemical waste in secondary containment and away from all floor and sink drains.

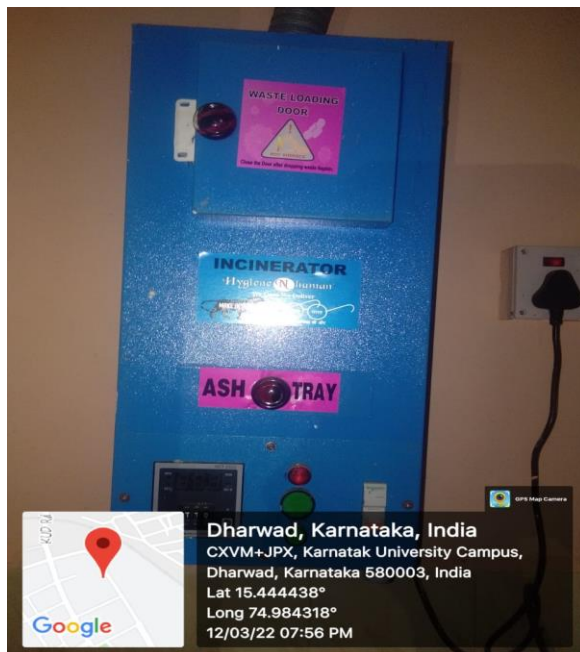
Total chemical waste generated on the campus through Science laboratories is 50.8 kg/month in solid form and 260.5 liters/month in liquid form. Usually there is a practice in the laboratories to store these hazardous chemicals in the containers and cans for safe disposal.

5) BIOHAZARD WASTE AUDIT

The biomedical wastes such as gloves, syringes, cotton, strips cover and bandage waste etc. generated from university hospital in campus is 10 kg/ month in the form solid and practiced since as safe disposal. Once. Biomedical waste are collected in respective biohazard disposable bags/containers, municipal corporation authority will collect



them every alternate day and transport to common biohazard disposal unit.



Throughout all ladies hostels, electrical incinerators have been installed in order to maintain the women hygiene.

Proper chemical waste management protects the health and safety of everyone and prevents or minimizes pollution. All generators of chemical waste should do their best to minimize the amounts of chemical waste they generate and recycle whenever possible.

6) E-WASTE AUDIT

E-waste generated in the university is of schedule II of CPCB, New Delhi. E-waste generated in the university is handled, treated and disposed in scientific way. E-waste handled by university is 40.5 kg/month and E-waste treated and disposed is 40.5 kg/month. Collected E-waste will be auctioned annually two times as per university protocol.

7) ENERGY AUDIT

Energy plays a key role in the development and growth of the economy of the country. The Karnatak University has put special emphasis to ensuring adequate, reliable, secure and cost-effective supplies and to utilizing energy resources efficiently while minimizing the negative impacts on the environment. An energy audit is an examination of the energy consumption of the equipment or system to ensure that energy is being used efficiently. The justification in order to meet the facilities requirement according to the types and purposes such as Research Laboratories in various departments, administrative offices and various departments, Libraries, Hostels, Guest House, Residential blocks, Canteen and auditoriums.

Electricity consumption

The utilization of electrical energy in the Karnatak University campus includes Research laboratories in various departments, administrative offices and other utility buildings. The major supplier of the electrical energy is the HESCOM, a state government owned electrical company. Apart from that, solar power water heating facilities installed in various hostels and Guest houses. Also, the solar power plant is installed in Main building to meet the electricity requirements.

The electrical consumption in the administrative buildings

The administrative buildings include examination building (Vishwa chetan), Finance building, Main building and other utility buildings. The electrical consumption in these buildings mainly comes from, Air-conditioned instruments, coolers, fans and Fridges, lift and IT server machines, heaters and printing press equipments.

The electrical consumption in the various department laboratories and other utility buildings.

The electrical consumption in the departmental laboratories includes, equipments, Air-conditioned units, Gas plants, Vacuum plants, multimedia accessories, photographic accessories a fans and bulbs.

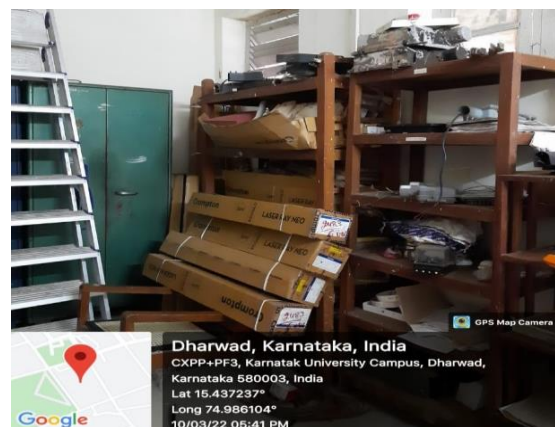
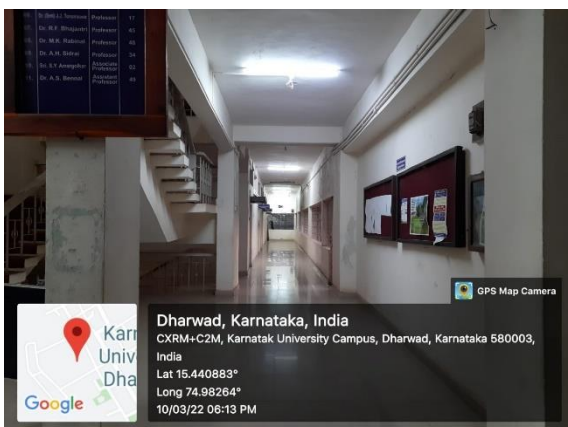
Table 1: Total consolidated Electrical consumption from Karnatak University, Dharwad. (HESCOM-Hubballi)

Sl.	Year	Kw/Annum	Amount paid to HESCOM-Hubballi
1	2017	10,03,812	1,06,87,180=00
2	2018	13,01,883	1,23,60,620=00
3	2019	13,90,847	1,48,07,778=00
4	2020	8,71,082	92,74,059=00
5	2021	10,59,004	1,12,75,425=00

In order to save the energy, the university has adopted various measures including installing solar power dependent equipments such as solar heaters, solar boilers and solar street lamps. Wherever it is possible, the university has installed power saving LED



bulbs/tube lights. The university finance committee, technical committee and other related committee will prefer to recommends 5-Star rated power efficient electrical equipments and appliances. The electrical wiring across campus have been replaced/upgraded periodically for power efficient supply.



Precautionary measures:

University should consider following precautionary measures for improving campus environment.

- Non-teaching staff or peons in the concerned section should take responsibility of monitoring the overflow of water tanks.
- Large amount of water is wasted during the practical process in Science laboratories. Designs of small water recycle system helps to reuse of water.
- Producing distilled water in the laboratories required large amount of water to distillate. To produce 1 liter of distilled water required more than 33 liters of water. To avoid more wastage university should design common distillation plant for Science Department.
- Reduce chemical waste formation in Chemistry laboratory, adopt the principles of green chemistry to reduce chemical waste.
- Pipes, overhead tanks and plumbing system should be maintained properly to reduce leakages and wastages of water.

8) FLORA OF KARNATAK UNIVERSITY CAMPUS

Karnatak University, Dharwad (15° 26' N and 74° 49' E) is located at an elevation of 698.97m above the Mean Sea Level (MSL) commonly known as 'Chota Mahabaleshwara Hill' on the western frontier of the Dharwad city. The temperature ranges from 16° to 38 °C and an average annual rain fall of 800-900 mm. The campus is spread over an area of 888 acres with undulating topography. It is endowed with dry deciduous type of plant vegetation nearing about 150 families of plants. The plants are distributed densely at botanical garden and less towards the road sides, staff quarters, hostel and various Departments.

Approximate vegetation coverage: 70% = 620 acres

The institution has taken measurements to set up a 'green campus' over the last five years

Table 2: Details of the plants during last five years

2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Cherry-100	Rose-143	Maxican	Buganvillia	Maxin	Lemon-5
Button	Button	lawn-1300	mix-40	lawn-30	Anjur-5
Rose-50	Rose-57	feet	Plumeria	feet	Pome
Rose-170	Plumeria	Rose-40	pink-4	Rose-20	granate-5
Gajinia -80	pudica-20	Areca palms-	Plumeria	Button	Sheetha phal-
Maxican	Ficus	60	pudica-20	Rose-10	5
lawn-3000	Benjamin-	Plumeria	Areca	Hibiscus-	Cherry-5
Plumeri	20	pudica-10	palm-120	10	Papaya-5
pudica-50	Heliconia-	Ficus	Plumeria	Areca	Rose-6
Areca	28	Benjamin-22	pudica-73	palm-70	Hanaman
palm-60	Tree firn-70	Maxican	Ficus	Crotons-10	phal-10
Ficus	Saint	lawan-50	Benjamin-	Heliconia-6	Giranium-8
Benjamin-	augustin -2	feet	10	Black	Hibiscus-6
10	Bag	Heliconia-20	Ixora-10	bamboo-2	Nandi
	Chery-61	Hibisucus-12	Budda	Plumeria	battalu-6
	Hibiscus-73	Golden	bamboo-10	pudica-10	
	Ficus	bamboo-50	Golden	Ficus	
	Benjamin-	Tree firn-22	bamboo-40	Benjamin-	
	40	Ixora-20	Tree firn-20	10	
	Plumeria	Gajenia-40	Golden	Ixora-10	
	pudica-80	Lantan -60	Cyprus-66	Lantan mix	
	Areca palm-	Budda	Lantan-10	-50	
	50	bamboo-5	Singapur	Golden	
	Almonda-	Golden	cherry-4	Cyprus-50	
	30	Cyprus-18	Rose-30	Golden	
	Golden	Mango -6		bamboo-	
	bamboo-50			200	

Table 3: Details of the lawn coverage in the Karnatak University, Dharwad.

Sl. No.	Name of the place	Area covered in sq. meter.
1	Old Guest House	390
2	New Guest House	250
3	MCA Department	155
4	Kanaka Bhavan	520
5	Shri. S.S. Basavnal Library	1800
6	Back side of the Main building	160
7	Front side of the Main building	850
8	Administrative building	1100
9	Health centre	160
10	Registrar's Bungalow	200
11	Vice-chancellor's Bungalow	350
12	Between double Road	100
13	Green Library	4250
14	Botany Department	3.5
15	Gandhi Bhavan Circle	3
16	Bus stand circle	5
17	Garden Department	85
	TOTAL	10151.2 sq.M

Table 4: Approximate Number of plants

Sl. No.	Name of the plant	No. of plants
1.	<i>Acacia</i>	2000
2.	<i>Azadirachta indica</i> (Neem)	65
3.	<i>Bamboo</i>	100
4.	<i>Bauhinia racemosa</i>	20
5.	<i>Bombax</i>	15
6.	<i>Cassia pistula</i>	25
7.	<i>Casurina</i>	30
8.	<i>Cherry</i>	100
9.	<i>Chikku</i>	87
10.	<i>Coconut</i>	200
11.	<i>Delonex regia</i>	203
12.	<i>Different types of palms</i>	1020
13.	<i>Eucalyptus</i>	Approximately 50,000
14.	<i>Eugenia jambolana</i>	50
15.	<i>Ficus recemosa</i>	4
16.	<i>Ficus sps</i>	20
17.	<i>Grevillea robusta</i> (<i>Silver oak</i>)	20
18.	<i>Guava</i>	200
19.	<i>Holoptelea integrifolia</i>	10
20.	<i>Indian almond</i> (<i>Badam</i>)	40
21.	<i>Jack Fruit</i>	15
22.	<i>Mango</i> (<i>Javari</i>)	80

23.	<i>Mango(Apoosa)</i>	236
24.	<i>Michalia champaka</i>	10
25.	Orchids.	More than 500
26.	<i>Peltoform</i>	450
27.	<i>Pithecellobium dulce</i>	20
28.	<i>Polyalthia longifolia</i>	80
29.	<i>Pongamia glabra</i>	80
30.	<i>Pterocarpus marsupium</i>	40
31.	<i>Samania (Rain Tree)</i>	50
32.	<i>Santalum qalbum (Sandal wood tree)</i>	200
33.	<i>Spathodia</i>	30
34.	<i>Tabobia</i>	20
35.	<i>Tamarind sps.</i>	250
36.	<i>Tecoma stans</i>	20
37.	<i>Tectona grandis</i>	50
38.	<i>Terminalia arjuna</i>	40
39.	<i>Tree firns</i>	65
40.	<i>Zizypus</i>	10

Table 5: List of medicinal plants in the Karnatak University, Dharwad

Sl. No.	Name of the plants
1.	<i>Abrus precatorius</i>
2.	<i>Abutilon indicum</i>
3.	<i>Abutilon indicum</i>
4.	<i>Acacia ferruginea</i>
5.	<i>Acalypha indica</i>
6.	<i>Acanthospermum hispidum</i>
7.	<i>Achyranthes aspera</i>
8.	<i>Acorus calamus</i>
9.	<i>Adhatoda zeylanica</i>
10.	<i>Aegle marmelos</i>
11.	<i>Ageratum conizoides</i>
12.	<i>Alangium salvifolium</i>
13.	<i>Aloe vera</i>
14.	<i>Alstonia scholaris</i>
15.	<i>Alternanthera sessilis</i>
16.	<i>Amaranthus spinosus</i>
17.	<i>Andrographis paniculata</i>
18.	<i>Annona muricata</i>
19.	<i>Annona squamosa</i>
20.	<i>Argyreia cuneata</i>
21.	<i>Artemisia maritime</i>
22.	<i>Artemisia maritime</i>
23.	<i>Artistolochia indica</i>
24.	<i>Artocarpus heterophyllus</i>
25.	<i>Asparagus recemosus</i>
26.	<i>Azima tetracantha</i>
27.	<i>Bacopa monnieri</i>
28.	<i>Balanites aegyptiaca</i>
29.	<i>Bidens bipinnata</i>
30.	<i>Bombax ceiba</i>
31.	<i>Butea monosperma</i>
32.	<i>Calophyllum inophyllum</i>
33.	<i>Calotropis procera</i>
34.	<i>Canthium rheedii</i>
35.	<i>Carissa congesta</i>
36.	<i>Cassia absus</i>
37.	<i>Cassia alata</i>
38.	<i>Cassia fistula</i>
39.	<i>Cassia tora</i>
40.	<i>Celastrus paniculata</i>
41.	<i>Celosia argentea</i>
42.	<i>Centella asiatica</i>
43.	<i>Centhratherum anthelminticum</i>
44.	<i>Cinnamomum verum</i>
45.	<i>Cissus quadrangularis</i>

46.	<i>Clerodendron philomidis</i>
47.	<i>Clerodendron serratum</i>
48.	<i>Cocculus hirsutus</i>
49.	<i>Coleus amboinicus</i>
50.	<i>Commeliana benghalensis</i>
51.	<i>Croton roxburghii</i>
52.	<i>Curcuma longa</i>
53.	<i>Cynodon dactilon</i>
54.	<i>Cyprus rotundus</i>
55.	<i>Datura melet</i>
56.	<i>Decalepis hamiltonia</i>
57.	<i>Desmodium triflorum</i>
58.	<i>Dodonaea viscosa</i>
59.	<i>Dracaena terniflora</i>
60.	<i>Drypetes roxburghii</i>
61.	<i>Echinops echinatus</i>
62.	<i>Eclipta alba</i>
63.	<i>Embllica afficinalis</i>
64.	<i>Emidesmus indica</i>
65.	<i>Erythrina suberosa</i>
66.	<i>Euphorbia hirta</i>
67.	<i>Evolvulus alsinoides</i>
68.	<i>Fibristylis lunciformis</i>
69.	<i>Ficus amplissima</i>
70.	<i>Ficus arnottiana</i>
71.	<i>Ficus hispida</i>
72.	<i>Ficus nervosa</i>
73.	<i>Ficus religiosa</i>
74.	<i>Garcinia indica</i>
75.	<i>Globba marantina</i>
76.	<i>Gloriosa superb</i>
77.	<i>Gmelina arborea</i>
78.	<i>Grewia hirsute</i>
79.	<i>Gygraphila spinosa</i>
80.	<i>Gymnema sylvestre</i>
81.	<i>Gymnosporin montana</i>
82.	<i>Hemudesmus indicus</i>
83.	<i>Hibiscus rosa-sinensis</i>
84.	<i>Holarrhena pubescens</i>
85.	<i>Holoptelea integrifolia</i>
86.	<i>Hygrophila auriculata</i>
87.	<i>Ichnocarpus fruticosa</i>
88.	<i>Ionidium suffruticosum</i>
89.	<i>Ixora coccinea</i>
90.	<i>Kaempferia galangal</i>
91.	<i>Lantana camara</i>
92.	<i>Launaea acaulis</i>
93.	<i>Lawsonia inermis</i>

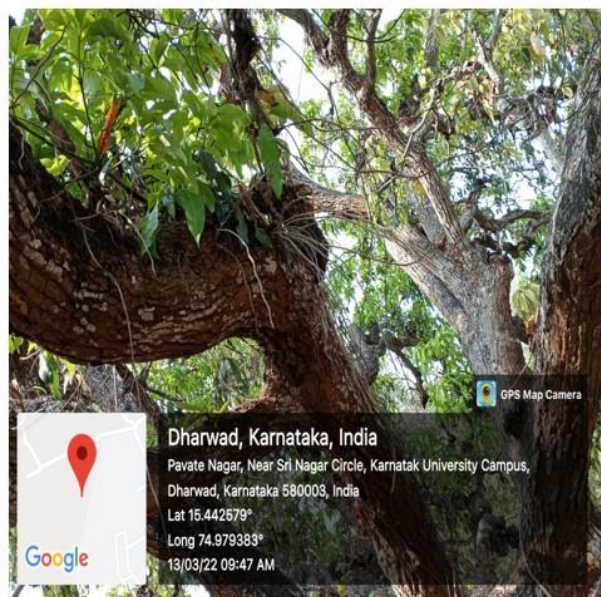
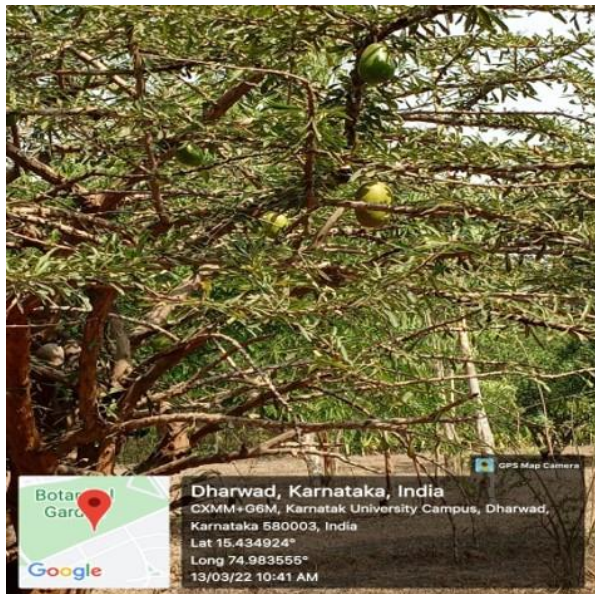
94.	<i>Leea crispa</i>
95.	<i>Leea macrophylla</i>
96.	<i>Leonotis nepetifolia</i>
97.	<i>Leptadenia reticulata</i>
98.	<i>Leucas aspera</i>
99.	<i>Malvastrum coromandelianum</i>
100.	<i>Mesua ferrea</i>
101.	<i>Mimosa pudica</i>
102.	<i>Mimusops elengi</i>
103.	<i>Mirabilis jalapa</i>
104.	<i>Mollugo pentaphylla</i>
105.	<i>Mucuna pruriens</i>
106.	<i>Myristica fragrans</i>
107.	<i>Nelumbo nucifera</i>
108.	<i>Nyctanthes orbortristis</i>
109.	<i>Ocimum basilicum</i>
110.	<i>Ocimum gratissimum</i>
111.	<i>Ocimum sanctum</i>
112.	<i>Opuntia elatior</i>
113.	<i>Oroxylum indicum</i>
114.	<i>Oxalis latifolia</i>
115.	<i>Passiflora foetida</i>
116.	<i>Phyllanthus amarus</i>
117.	<i>Phyllanthus emblica</i>
118.	<i>Piper longum</i>
119.	<i>Pithecellobium dulce</i>
120.	<i>Plumbago zeylanica</i>
121.	<i>Polygonum plebeium</i>
122.	<i>Pongamia pinnata</i>
123.	<i>Portulaca oleracea</i>
124.	<i>Pterospermum acerfolium</i>
125.	<i>Putranjiva roxburghii</i>
126.	<i>Rauwolfia serpentine</i>
127.	<i>Rauwolfia tetraphylla</i>
128.	<i>Rhynchosia minima</i>
129.	<i>Ricinum communis</i>
130.	<i>Ruellia tuberosa</i>
131.	<i>Ruta chalepensis</i>
132.	<i>Ruta graveolensis</i>
133.	<i>Rynchosia minima</i>
134.	<i>Santalum album</i>
135.	<i>Sapindus trifoliata</i>
136.	<i>Saraca asoca</i>
137.	<i>Scoparia dulcis</i>
138.	<i>Securinea leucopyrus</i>
139.	<i>Semecarpus anacardium</i>
140.	<i>Sesbenia grandiflora</i>
141.	<i>Sida acuta</i>

142.	<i>Sida rhombifolia</i>
143.	<i>Solanum nigrum</i>
144.	<i>Solanum torvum</i>
145.	<i>Solanum xanthocarpum</i>
146.	<i>Spermacoce hispida</i>
147.	<i>Sphoeranthus indica</i>
148.	<i>Spilanthes clava</i>
149.	<i>Stachytarpheta indica</i>
150.	<i>Stereospermum chelonoid</i>
151.	<i>Strychnos nux-vomica</i>
152.	<i>Syzygium malaccense</i>
153.	<i>Terminalia bellarica</i>
154.	<i>Tinospora cardifolia</i>
155.	<i>Tribulus terrestris</i>
156.	<i>Triumfetta rhomboidea</i>
157.	<i>Turnera angustifolia</i>
158.	<i>Tylophora arborea</i>
159.	<i>Tylophora indica</i>
160.	<i>Uvaria kirkii</i>
161.	<i>Vernonia cinerea</i>
162.	<i>Vitex negunda</i>
163.	<i>Withania somnifera</i>
164.	<i>Xanthium indicum</i>
165.	<i>Zyzygium cumini</i>













9) FAUNA OF KARNATAK UNIVERSITY CAMPUS

The campus harbors rich faunal diversity which comprises of spiders (20 species), insects (180 species), frogs and toads (14 species), snakes and lizards (22 species) and birds (45 species). Following tables provide a detailed checklist of animal species recorded from the campus.

Table 6: Checklist of Spiders in Karnatak University Campus Dharwad

Sl. No.	Species
1	<i>Argiope aemula</i>
2	<i>Argiope anasuja</i>
3	<i>Argiope pulchella</i>
4	<i>Chorizopes bengalensis</i>
5	<i>Cyrtarachne keralayensis</i>
6	<i>Eriophora himalayaensis</i>
7	<i>Gasteracantha geminate</i>
8	<i>Gasteracantha hasselti</i>
9	<i>Hersilia savignyi</i>
10	<i>Paradosa pseudoannulata</i>
11	<i>Hippasa agelenoids</i>
12	<i>Hippasa greenalliae</i>
13	<i>Lycosa mackenziei</i>
14	<i>Pardosa birmanica</i>
15	<i>Pardosa sumatrana</i>
16	<i>Oxyopes birmanicus</i>
17	<i>Perenethis venusta</i>
18	<i>Thalassius albocinctus</i>
19	<i>Bavia kairali sp.</i>
20	<i>Myrmarachne orientales</i>

Table 7: Checklist of all Insect species according to their respective orders

Order 1: Hemiptera

Sl No.	Family	Scientific Name	Common Name
1	Alydidae	<i>Riptortus linearis</i>	Broad headed bug
2		<i>Riptortus pedestris</i>	Bean bug
3	Belostomatidae	<i>Abedus herberti</i>	Giant water bug
4		<i>Lethocerus americanus</i>	Giant water bug
5	Berytidae	<i>Metacanthus pulchellus</i>	Thread legged bug
6	Cicadidae	<i>Platypleura basialba</i>	Cicada
7	Cimicidae	<i>Cimex lectularius</i>	Bed bug
8	Coreidae	<i>Anoplocnemis phasiana</i>	Leaf footed bug

9	Fulgoridae	<i>Kalidasa nigromeculata</i>	Cicada
10	Nepidae	<i>Nepa cineria</i>	Water scorpion
11	Pentatomidae	<i>Erthesina acuminata</i>	Yellow spotted stink bug
12		<i>Halys dentatus</i>	Brown marmorated bug
13		<i>Nezara viridula</i>	Green stinct bug
14		<i>Placosternum sp.</i>	Not known
15	Pyroccoridae	<i>Dysdercus cingulatus</i>	Red silk cotton bug
16		<i>Dysdercus sp</i>	Cotton bug
17	Reduviidae	<i>Acanthaspis luteipes</i>	Assassin bug
18		<i>Endochus inornatus</i>	Assassin bug
19		<i>Sycanus collaris</i>	Not known
20		<i>Rhinocoris sp.</i>	Assassin bug
21	Scutelleridae	<i>Chrysocoris stolli</i>	Jewel bug
22		<i>Scutellera perplexa</i>	Jewel bug

Table 8: Order 2: Blattodea

Sl No.	Family	Scientific Name	Common Name
1	Blattodea	<i>Periplanata americana</i>	American cockroach

Table 9: Order 3: Coleoptera

Sl No.	Family	Scientific Name	Common Name
1	Buprestidae	<i>Sternocera sp.</i>	Jewel beetle
2	Carabidae	<i>Calosoma inquistor</i>	Ground beetle
3	Cerambycidae	<i>Coptops aedificator</i>	stem bore or Long horn beetle
4		<i>Stenochorus meridianus</i>	Long horn beetle, musk beetle
5		<i>Xystrocera globosa</i>	Striped Long horned beetle
6	Chrysomelidae	<i>Aspidimorpha sanctaetrucis</i>	Tortoise beetle
7		<i>Clytrinae sp.</i>	Not known
8		<i>Zygogramma bicolorate</i>	Parthenium beetle
9	Coconellidae	<i>Coccinella transversalis</i>	Lady bird beetle
10		<i>Cheilomenes sexmaculata</i>	Lady bird beetle
11		<i>Paranaemia vittigera</i>	Stripped lady beetle
12	Cucujidae	<i>Cucujus clavipes</i>	Red flat bark beetle

13	Elateridae	<i>Lanelater sp</i>	Click beetle
14	Lampyridae	<i>Oculogryphus sp.</i>	Fire fly female or lightning bugs
15	Scarabaeidae	<i>Cyclocephala sp.</i>	Not known
16		<i>Helicocopriss bucephalus</i>	Giant dung beetle
17		<i>Holotrichia serrata</i>	Chafer beetle

Table 10: Order 4: Diptera

Sl. No.	Family	Scientific Name	Common Name
1	Bibionidae	<i>Plecia nearctica</i>	March fly or love bug
2	Calliphoridae	<i>Calliphora vomitoria</i>	Bottle fly or green bottle fly
3		<i>Protophormia terraenovae</i>	Blue bottle fly
4	Culicidae	<i>Aedes aegypti</i>	Yellow fever mosquito
5		<i>Aedes albopictus</i>	Asian tiger mosquito
6		<i>Anopheles stephensi</i>	Indo-Pakistan malaria mosquito
7		<i>Culex pipiens</i>	House mosquito
8		<i>Culex quinquefasciatus</i>	Southern house mosquito
9	Drosophilidae	<i>Chymomyza vaidyai</i>	Fruit Fly
10		<i>Drosophila busckii</i>	Fruit Fly
11		<i>Drosophila trisetosa</i>	Fruit Fly
12		<i>Drosophila nasuta nasuta</i>	Fruit Fly
13		<i>Drosophila s. neonasuta</i>	Fruit Fly
14		<i>Drosophila repleta</i>	Fruit Fly
15		<i>Drosophila daruma</i>	Fruit Fly
16		<i>Drosophila Polychaeta</i>	Fruit Fly
17		<i>Drosophila melanogaster</i>	Fruit Fly
18		<i>Drosophila ananassae</i>	Fruit Fly
19		<i>Drosophila bipectinata</i>	Fruit Fly
20		<i>Drosophila malerkotliana</i>	Fruit Fly
21		<i>Drosophila rajasekari</i>	Fruit Fly
22		<i>Drosophila eugracilis</i>	Fruit Fly
23		<i>Drosophila jambulina</i>	Fruit Fly
24		<i>Drosophila kikkawai</i>	Fruit Fly
25		<i>Phorticella striata</i>	Fruit Fly
26		<i>Scaptodrosophila sp.</i>	Fruit Fly

Table 11: Order 5: Odonata

Sl No.	Family	Scientific name	Common name
1	Aeshnidae	<i>Triscanthagyna septima</i>	Pale green darner
2	Coenagrionidae	<i>Agriocnemis kalinga</i>	Pin head wisp
3		<i>Ceriagrion coromandelianum</i>	Coromandel marsh dart
4	Libellulidae	<i>Pantala flavescens flavescens</i>	Wandering glinder

Table 12: Order 6: Mantodea

Sl No.	Family	Scientific name	Common name
1	Empusidae	<i>Gongylus gongylodes</i>	Indian rose mantis

2	Hymenopodidae	<i>Crebroper sp.</i>	Praying mantis
3	Liturgusidae	<i>Humbertiella sp.</i>	Bark mantis
4	Mantidae	<i>Gonatista greisea</i>	Grizzled mantis
5		<i>Hierodule sp.</i>	Giant asian mantis
6		<i>Paraoxyphilus tasmaniensis</i>	Black bark mantis
7	Toxoderidae	<i>Aerthalochroa insignis</i>	Indian stick mantis
8	Thespidae/Mantidae	<i>Parathespis sp.</i>	Ground mantis

Table 13: Order 7: Orthoptera

Sl No.	Family	Scientific name	Common name
1	Acrididae	<i>Acrida exaltata</i>	Toothpick grasshopper
2		<i>Amblytropidia mysteca</i>	Brown winter grasshopper
3		<i>Melanoplus differentialis</i>	Differential grasshopper
4		<i>Phlacoba infumata</i>	-
5		<i>Schistocerca ameericana</i>	Large grasshopper
6		<i>Tetratodes montocilis</i>	Brown morph
7		<i>Trilophidia anulata</i>	Grasshopper
8	Gryllidae	<i>Loxblemmus sp.</i>	Cricket
9		<i>Teleogryllus alchetron</i>	Ground cricket
10		<i>Teleogryllus emma</i>	Ground cricket
11	Tettigoniidae	<i>Bucrates mailvolans</i>	Red tailed hopper
12		<i>Ducetia japonica</i>	Green katydid
13		<i>Scudderia furcata</i>	Fork tailed bush katydid
14		<i>Sathrophyllia sp.</i>	Katykid

Table 14: Order 8: Siphonaptera

Sl No.	Family	Scientific name	Common name
1	Pulicidae	<i>Pulex irritans</i>	Human flea

Table 15: Order 9: Hymenoptera

No.	Family	Scientific name	Common name
1	Apidae	<i>Apis dorsata</i>	Giant honeybee
2		<i>Apis florea</i>	Large honeybee
3		<i>Tetragonula iridipennis</i>	Dammer bee
4		<i>Xylocopa sp.</i>	Carpenter bee
5	Chrysididae	<i>Ampulex compressa</i>	Emerald wasp
6		<i>Stilbum cyanurum</i>	Cuckoo wasp
7	Formicidae	<i>Camponotus americanus</i>	Carpenter ant
8		<i>Camponotus compresses</i>	Carpenter ant
9		<i>Camponotus modoc</i>	Western carpenter ant
10		<i>Camponotus pensylvanicus</i>	Black carpenter ant
11		<i>Camponotus sericeus</i>	Golden black ant
12		<i>Dorylus labiatus</i>	Labiates male

13		<i>Formica rufa</i>	Horse/Red wood ant
14		<i>Harpegnathos saltator</i>	Jumping ant
15		<i>Iridomyrmex purpureus</i>	Meat ant
16		<i>Monomorium minimum</i>	Little black ant
17		<i>Oecophylla smargdina</i>	Weaver ant
18		<i>Paratrechina longicornis</i>	Black crazy ant
19		<i>Pheidole obscurithorax</i>	Obscure thorax
20		<i>Solenopsis germinate</i>	Fire ant
21		<i>Solenopsis invicta</i>	Red imported ant
22		<i>Tapinoma sessile</i>	Odorous house ant
23		<i>Tetramorium caespium</i>	Pavement ant
24		<i>Tetraponera rufonigra</i>	Arboreal bicolor ant
25	Mutillidae	<i>Dasymutilla occidentalis</i>	Red velvet ant
26	Pompilidae	<i>Anoplius sp.</i>	Blue black Spider wasp
27		<i>Cryptocheilus bicolor</i>	Black orange wasp
28	Scoliidae	<i>Scolia sp.</i>	Black flower wasp
29	Sphecidae	<i>Chalybion sp.</i>	Blue mud dauber wasp
30	Syrphidae	<i>Volucella sp.</i>	Hovers fly
31	Vespidae	<i>Delta conoideum</i>	Potter wasp
32		<i>Delta pyriforme</i>	Potter wasp
33		<i>Phimenes flavopictum</i>	Potter wasp
34		<i>Ropalidia marginata</i>	Potter wasp
35		<i>Ropalidia sp.</i>	Potter wasp

Table 16: Order 10: Lepidoptera

Sl. No.	Family name	Scientific name	Common name
1	Erebidae	<i>Lymantria dispar</i>	Gypsy Moth
2		<i>Eudocima phalonia</i>	Fruit Piercing Moth
3	Lymantriidae	<i>Orgyia leucostigma</i>	White Marked Tussock Moth
4		<i>Orgyia antique</i>	Live Oak Tussock Moth
5		<i>Orgyia australis</i>	Painted Pine Moth
6		<i>Euproctis Vasquez</i>	Sweet Potato Tussock Moth
7	Arctiidae	<i>Hypercompe scribonia</i>	Giant Leopard Moth
8		<i>Spilosoma oblique</i>	Sunflower Bihar Hairy
9		<i>Arctia caja</i>	Garden Tiger Moth
10	Crambidae	<i>Uresiphita reversalis</i>	Genista Broom Moth
11	Noctuidae	<i>Polytella gloriosae</i>	Lily Moth
12		<i>Spodoptera litura</i>	Taro Caterpillar
13	Plutellidae	<i>Plutella xylostella</i>	Diamond Back Moth or Cabbage Moth
14	Papilionidae	<i>Graphium Agamemnon</i>	Tailed Jay
15		<i>Papilio demoleus</i>	Citrus Papilla Butterfly or Citrus Swallow Tail
16	Geometridae	<i>Biston betularia</i>	Peppered Moth
17	Hesperiidae	<i>Erynnis baptisiae</i>	Wild Indigo Dusky Wing
18	Nymphalidae	<i>Danaus gilippus</i>	Queen Butterfly
19		<i>Euthalia aconthea</i>	Common Baron
20		<i>Euploea core</i>	Common Crow Butterfly
21		<i>Ariadne merione</i>	Common Castor Butterfly
22	Sphingidae	<i>Deilephila elpenor</i>	Elephant Hawk Moth
23		<i>Hippotion celerio</i>	Vine Hawk Moth
24		<i>Acherontia atropos</i>	Death's Head Hawk Moth
25		<i>Ceratomia undulosa</i>	Waved Sphinx Moth

Table 17: Check list of Amphibians from Karnatak University Campus Dharwad

Sl. No.	Scientific Name	Common Name
1.	<i>Haplobatrachus tigrinus</i>	Indian bull Frog
2.	<i>Euphlctis cyanophlyctis</i>	Skipper Frog
3.	<i>Limnonectes limnocharis</i>	Indian Cricket Frog
4.	<i>Microhyla rubra</i>	Red narrow mouthed Frog
5.	<i>Ramanella variegata</i>	
6.	<i>Raorchestes bombayensis</i>	Bush Frog
7.	<i>Polypedates maculatus</i>	Common Tree Frog
8.	<i>Duttaphrynus melaostictus</i>	Common Indian Toad
9.	<i>Bufo scaber</i>	Fergusons Toad
10.	<i>Indirana semipalmata</i>	Leaping Frog
11.	<i>Hylarana malabarica</i>	Fungoid Frog
12.	<i>Clinotarsus curtipes</i>	Bicoloured Frog
13.	<i>Uperdon systoma</i>	Marbled ballon Frog
14.	<i>Euphlyctis cyanophlyctis</i>	Skittering Frog

Table 18: Checklist of Reptiles from Karnataka University Campus Dharwad

Sl.No.	Scientific Name	Common Name
1.	<i>Python molurus</i>	Indian Rock Python
2.	<i>Oligodon arnensis</i>	Banded kukri
3.	<i>Lycodon striatus</i>	Barred wolf snake
4.	<i>Lycodon aulicus</i>	Common wolf snake
5.	<i>Lycodon flavicollis</i>	Yellow collared wolf snake
6.	<i>Xenochrophi spiscator</i>	Checkered keelback
7.	<i>Macropisthodon plumbicolor</i>	Green keelback
8.	<i>Coelognathus helena helena</i>	Common trinket snake
9.	<i>Ahaetulla Nasuta</i>	Green vine snake
10.	<i>Boiga triganata</i>	Common cat snake
11.	<i>Bungarus caeruleus</i>	Common Indian Krait
12.	<i>Naja naja</i>	Spectacle cobra
13.	<i>Daboia russelii</i>	Russell's viper
14.	<i>Uropeltis ceylanica</i>	Curvier's shield tail
15.	<i>Hemiductylus leschenautia</i>	Indian bark gecko
16.	<i>Hemiductylus brookii</i>	Brook's house gecko
17.	<i>Hemiductylus frenatus</i>	South asian house gecko
18.	<i>Calotes versicolor</i>	Indian garden lizard
19.	<i>Calotes rouxii</i>	Roux's forest lizard
20.	<i>Chamaeleo zeylanicus</i>	Indian chameleon
21.	<i>Mabuya macularia</i>	Bronze grass skink
22.	<i>Gymnophthalmus plei</i>	Pigmy skink

Table 19: Check list of birds from Karnatak University Campus, Dharwad

Sl. No	Scientific Name	Common Name	Family	Order
1	<i>Turdoides affinis</i>	Yellow billed-babbler	Leiothrichidae	Passeriformes
2.	<i>Motacilla maderaspatensis</i>	White browed wagtail	Motacillidae	Passeriformes
3.	<i>Motacilla flava</i>	Yellow wagtail	Motacillidae	Passeriformes
4.	<i>Saxicoloides fulicatus</i>	Indian Robin	Muscicapidae	Passeriformes
5.	<i>Cyornis tickeliae</i>	Tickell's blue flycatcher	Muscicapidae	Passeriformes
6.	<i>Acridotheres tristis</i>	Common Myna	Sturnidae	Passeriformes
7.	<i>Eudynamis scolopaceus</i>	Asian Koel	Cuculidae	Cuculiformes
8.	<i>Centropus chlorohynchos</i>	Lesser Coucal	Cuculidae	Cuculiformes
9.	<i>Haliastur Indus</i>	Brahminy Kite	Acciptridae	Acciptiriformes
10.	<i>Milvus migrans</i>	Black Kite	Acciptridae	Acciptiriformes
11.	<i>Aquila rapax</i>	Tawny Eagle	Acciptridae	Acciptiriformes
12.	<i>Accipiter badius</i>	Shikra	Acciptridae	Acciptiriformes
13.	<i>Passer domesticus</i>	House sparrow	Passeridae	Passeriformes
14.	<i>Leptocoma zeylonica</i>	Purple-rumped sunbird	Nectariniidae	Passeriformes
15.	<i>Arachnothera longirostra</i>	Little spider hunter	Nectariniidae	Passeriformes
16.	<i>Pericrocotus cinnamomeus</i>	Small minivet	Campephagidae	Passeriformes
17	<i>Rhipidura albicollis</i>	White-spotted fantail	Rhipiduridae	Passeriformes
18.	<i>Pomatorhinus erythrogeus</i>	Indian scimitar babbler	Timallidae	Passeriformes
19.	<i>Dumetia hyperythra</i>	Tawny-bellied babbler	Timallidae	Passeriformes
20.	<i>Pycnonotus jocosus</i>	Red-whiskered bulbul	Pycnonotidae	Passeriformes
21	<i>Pycnonotus cafer</i>	Red-vented bulbul	Pycnonotidae	Passeriformes
22	<i>Pycnonotus luteolus</i>	White-browed bulbul	Pycnonotidae	Passeriformes
23	<i>Aegithina tiphia</i>	Common iora	Aegithinidae	Passeriformes
24	<i>Zosterop palpebrosus</i>	Oriental white eye	Zosteropidae	Passeriformes
25	<i>Megalania hemacephala</i>	Coppersmith barbet	Megaliidae	Piciformes
26	<i>Pittaculica krameri</i>	Rose-ringed parakeet	Pittaculidae	Pittaciformes

27	<i>Loriculus vernalis</i>	Vernal hanging parrot	Psittaculidae	Psittaciformes
28	<i>Prinia inornata</i>	Ashy prinia	Cisticolidae	Passeriformes
29	<i>Orthotomus sutorius</i>	Common tailor bird	Cisticolidae	Passeriformes
30	<i>Dicrurus macrocercus</i>	Black Drongo	Dicruridae	Passeriformes
31	<i>Ocyrceros birostris</i>	Indian Grey Horn bill	Bucerotidae	Bucerotiformes
32	<i>Petrochelidon fluvicola</i>	Streak-throated swallow	Hirundinidae	Passeriformes
33	<i>Merops orientalis</i>	Green bee eater	Meropidae	Coraciiformes
34	<i>Egretta garzetta</i>	Little egret	Ardeidae	Pelecaniformes
35	<i>Chloropsis auriformes</i>	Jerdons Leaf Bird	Chloropseidae	Passeriformes
36	<i>Picus chlorolophus</i>	Lesser yellownape	Picidae	Piciformes
37	<i>Halcyon smyrnensis</i>	White-throated kingfisher	Alcedinidae	Coraciiformes
38	<i>Lonchura punctulata</i>	Scaly-breasted munia	Estrilidae	Passeriformes
39	<i>Artamus fuscus</i>	Ashy Woodswallow	Artamidae	Passeriformes
40.	<i>Dicaeum agile</i>	Thick-billed flowerpecker	Dicaeidae	Passeriformes
41	<i>Acrocephalus tumetorum</i>	Blyth's reed warbler	Acrocephalidae	Passeriformes
42	<i>Columba livia</i>	Common pigeon	Columbidae	Columbiformes
43	<i>Stigma peliachinensis</i>	Spotted dove	Columbidae	Columbiformes
44	<i>Parus majord</i>	Great tit	Paridae	Passeriformes
45	<i>Corvus splendens</i>	House crow	Corvidae	Passeriformes





10) GLIMPSE OF KUD'S GREEN INITIATIVES









CONCLUSION

Green Audit is being valuable criterion to evaluate natural resources and its judicial use. Green auditing is the process of identifying and determining whether institutional practices are eco-friendly and sustainable. It is a continuous process of identification, quantification and documenting. Further, monitoring, action taken and reporting of events pertaining to environmental-friendly components in applicable areas are accomplished.

Karnatak University, Dharwad adheres to the necessary environmental policies laid down by the Government from time to time. The green patch on the campus exceeds 70% of the total land space. The Bio-diversity on the campus is exuberant with the flora and fauna diversity being unique to the campus. The species (Plant and animal) diversity includes some of the rare and neglected ones. The waste disposal that includes sewage water, solid waste, biohazard and e-waste are properly manned and executed for better recycling of the resources also involving external, concerned agencies. The disposal of sanitary pads in girls/ladies hostels on the campus adds a concern in bio-hazard waste management that is taken care by usage of pad-incinerators installed in the respective hostels minimizing the bio-hazard waste. Wastage of water is a primary concern and its conservation is duly considered by recycling the excess flow, leakage and the outlets of used water that is properly channelized for enhancement of greenery/plant, tree growth on the campus. This measure taken by the University practically saves significant amount of water and in-turn keeps campus green and cool. University also follows eco-friendly concepts such as power saving methods by usage of solar powered street lights, low energy consuming LED bulbs and power efficient electrical and electronic appliances.

Recommendations

Following are some of the important recommendations for improving and maintenance of eco-friendly campus environment:

1. A regular visit should be conducted to confirm that the generated waste is measured, monitored and recorded regularly and as and when it is possible, information should be made available to administration.
2. The solid waste generated should be reused at maximum possible places. There should be more garden pits to reuse biodegradable waste. The biodegradable waste is generated in more amounts in hostels which should be properly utilized for manure preparation or biogas generation.

3. Glass bottles from various chemical and life science departments should be encouraged to reuse and or the bottles should be sent back to suppliers for reuse.
4. More number of street lights should be replaced with solar driven lights.
5. Installation of sensor-based electrification items like lights fans, etc. can save electricity.
6. It is advised to use terrace area of all the departments to harvest rain water and to increase the ground water level.
7. Regular checkups and maintenance of pipes, overhead tanks and plumbing system should be done by engineering section to reduce overflow, leakages and corrossions.
8. It is encouraged to repair and to use refurbished electronic based equipment and computers to reduce e-wastes.