



**YENEPOYA**

(DEEMED TO BE UNIVERSITY)

Recognized under Sec 3(A) of the UGC Act 1956

Accredited by NAAC with 'A' Grade

**1.3.1. Institution integrates crosscutting issues relevant to Gender, Environment and Sustainability, Human Values, Health Determinants, Right to Health Issues, Emerging demographic changes and Professional Ethics in the curricula**

**Any other documents**

**Centre for Environmental Studies**

**Activities in the year 2020**

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Centre For  
Environmental Studies

# Centre for Environmental Studies

## ANNUAL REPORT 2020



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Vice Chancellor

**Dr. Sripathi Rao**  
Pro Vice Chancellor

**Dr. Gangadhar Somayaji K S**  
Registrar

### Editor

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Assistant Director  
Centre for Environmental Studies

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Yenepoya Medical College

**Mr. Mohammed Asif Iqbal C**  
Assistant Professor  
Yenepoya Pharmacy College



## EDITORIAL

Happy New Year to all of you. I am pleased to present the annual report of the Centre for Environmental Studies.

We are all facing the COVID-19 pandemic. The Government is making efforts to bring situation under control. As responsible citizens we must do our bit to avoid coronavirus infection – “wear a mask, keep two yard distance and wash hands frequently”. Stringent restrictions have halted most activities and caused millions to lose their jobs and revenue streams. The education system is also significantly disrupted. Around 32 crore learners in India stayed at home inevitably opting for technology oriented learning. At Yenepoya University all appropriate strategy was adopted to use online tools to assure that lesson plans, lectures, videos and other resources are available to students and teachers.

Due to less opportunity the Centre for Environmental Studies had fewer activities this year. Nevertheless the circumstances were utilized by the centre for digital based action. The centre launched an e-newsletter “Green Horizon” comprising articles on environment issues, education and conservation. This will certainly add to the knowledge-base of readers and create awareness. I am hopeful that this newsletter will take us another step closer to our goals of sustainable environment and a greener planet.

I am happy to say that the centre will keep on working towards the campus sustainable path and has come up with the Sustainable Action Plan (SAP) for achieving its objectives. I take this opportunity to thank all of those who contributed for SAP and Green Horizon for their unparallel efforts in fulfilling our dreams of clean and green environment.

I wish you all happiness and prosperity.

Dr. Bhagya B. Sharma

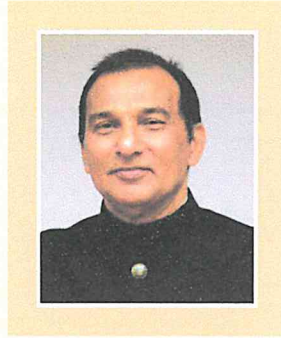
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## CHANCELLOR'S MESSAGE

The year 2020 brought the world to a standstill due to Covid-19 global pandemic. There was practically a total shutdown of all industrial, economic and social activities. Ironically, this gave the world a much needed reality check on human progress. With industries having closed down, researchers got a chance to evaluate the decrease in pollution based on various environmental parameters. Despite the many negative consequences we can treat the pandemic as a blessing in disguise, from a purely environmental point of view. It gives us the opportunity to change for the better.

To us at Yenepoya, many good things have happened during the last year. The year understandably had less number of activities. Yet, we took great strides. Most important of these is that we launched the Sustainable Campus initiative with a focus towards becoming an environmentally conscious campus. Impetus to solid waste management and electric vehicles on the campus, more greenery and move towards becoming a zero waste campus are a part of this vision. During the year, we also embraced the video conference mode and hosted many webinars on environmental issues. We also fulfilled a long cherished dream to launch an e-magazine 'Green Horizon' which will be bought out periodically by our Centre for Environmental Studies.

I congratulate the Centre for Environmental Studies on making the best of the present difficult situation. This annual report of activities is a testimony to the commitment and dedication of the Centre and its people. I hope they will be able to carry forward their vision on a much grander scale in the coming year.

**Yenepoya Abdullah Kunhi**  
Chancellor

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## VICE CHANCELLOR'S MESSAGE


While the Covid pandemic raged across the world, the biggest challenge faced by academic institutions such as ours was how to remain productive during the lockdown. The need for observing social distancing and avoiding outdoor activity was paramount. There was uncertainty regarding the future and an air of despair was evident everywhere. When faced with insurmountable difficulties, it is only hope and enthusiasm that can become our saviours. I am glad that the Centre for Environmental Studies at Yenepoya found the strength to act despite the grim situation. This report is a tribute to the tenacity of all those associated with the Centre.

If the pandemic has proved anything, it is the remarkable adaptability and the indomitable spirit of humankind. After the lockdown came into force, we responded with modern technology to quickly surmount the barriers that were preventing us from interacting with our fellowmen. Today online activity has become mainstream and webinars have proved to be a convenient and effective alternative to physical meetings. Centre for Environmental Studies was quick to harness this platform to organize a series of talks to keep our minds ticking. Further using digital technology, it has also launched its own e-magazine 'Green Horizon' which is interesting and is also informative and well curated.

In the meanwhile Yenepoya has launched the Sustainable Campus initiative as per UGC guidelines and it shall be our endeavour to emerge as a model campus. Due to our long standing environment friendly campus policy, we already have a head start, yet a lot more needs to be done within the larger policy framework provided by UGC. Centre for Environmental Studies will have a big role to play in making this vision a reality on Yenepoya campus.

I congratulate the Centre on bringing out this report and express my appreciation for the yeoman efforts rendered by the team. I wish them success and full support in the years to come.

**Dr. M. Vijayakumar**  
Vice Chancellor

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## Centre For Environmental Studies

The Centre for Environmental Studies has gloriously developed over the years and is making significant contribution in the field of Environment with the keen focus on Environmental Education, Research and Extension activities.

### VISION

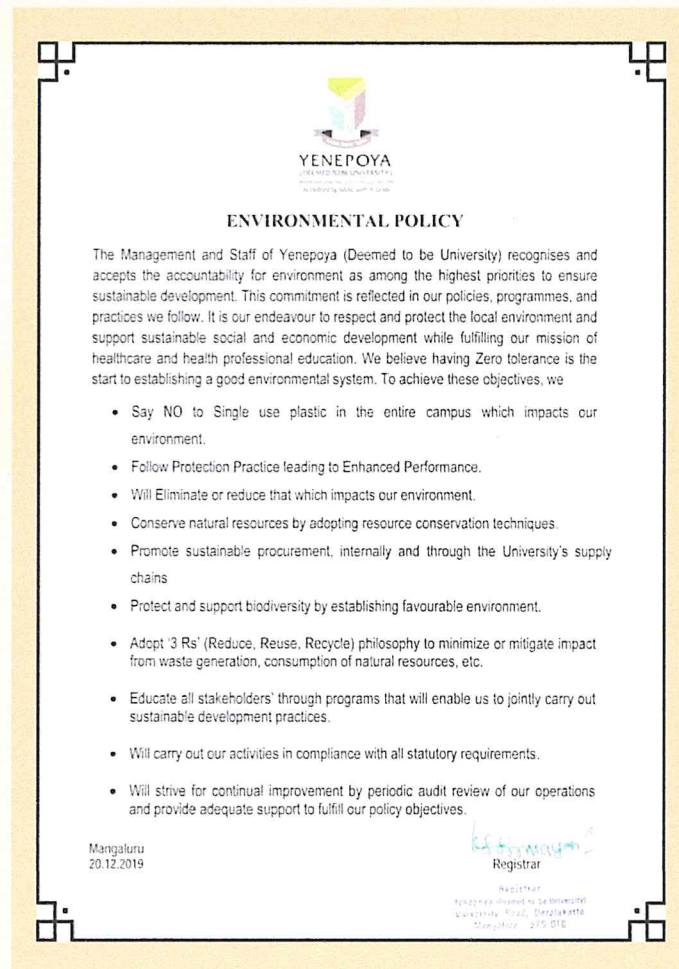
To ensure a planet where all life forms thrive

### MISSION

To develop skills and practices for sustainable development, this contributes to environmental protection.

### OBJECTIVES

- ◆ To promote awareness among all segments of the society
- ◆ To educate students and inculcate eco - friendly attitude
- ◆ To conduct research and disseminate solution to community issues
- ◆ To Establish efficient harvesting of renewable natural resources



## ENVIRONMENTAL ADVISORY COUNCIL

1. Vice Chancellor	Chairman
2. Pro Vice-Chancellor	Co-Chairman
3. Finance Officer	Member
4. Medical Superintendent	Member
5. Hospital Superintendent	Member
6. MD, Food Craft	Member
7. Deputy Director IT	Member
8. Head, Maintenance Department	Member
9. Environment Consultant	Member
10. Dr. Shrihari, Professor, Department of Civil Engineering, NITK, Surathkal	External Member
11. Mr. Madhu S. Manohar, Environmental Engineer, Mangalore City Corporation, Mangalore.	External Member
12. Assistant Director, CES	Co-ordinator
13. Registrar	Convenor

## CAMPUS SUSTAINABILITY COMMITTEE

1. Director – Purchase Department	: Chair Person
2. Maintenance Manager	: Member
3. Hospital Superintendent	: Member
4. Deputy Director, IT	: Member
5. Gen Manager, Yenepoya Food & Beverages Pvt. Ltd	: Member
6. General Supervisor	: Member
7. Representative, Purchase Dept/Central Stores	: Member
8. Transport Superintendent	: Member
9. Assistant Director, Centre for Environmental Studies	: Convenor

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## ACADEMICS

### **Yenepoya Medical College**

Batch: MBBS 2017

Year of participation in Environmental course: February 2020 to October 2020

No of Students: 150

### **Yenepoya Dental College**

Batch: BDS 2016

Year of participation in Environmental course: January 2020 to October 2020

No of Students: 03

### **Yenepoya Nursing College**

Batch: B.Sc Nursing 2018

Year of participation in Environmental course: August 2020 to December 2020

No of Students: 98

### **Yenepoya Physiotherapy College**

Batch: BPT 2018

Year of participation in Environmental course: October 2020 to December 2020

No of Students: 50

### **Bachelor of Hospital Administration**

Batch: BHA 2019

Year of participation in Environmental course: September 2020 to December 2020

No. of Students: 12

### **Yenepoya Faculty of Allied & Health Care Professionals**

Batch: B.Sc Technical Programme 2019

Year of participation in Environmental course: November 2020 to January 2021

B.Sc Renal Dialysis Technology

No. of Students: 13

B.Sc. Perfusion Technology

No. of Students: 10

B.Sc Medical Laboratory Technology

No. of Students: 19

B.Sc. Cardiovascular Technology

No. of Students: 10

B.Sc. Anesthesia and OT Technology

No. of Students: 20

B.Sc. Respiratory Care Technology

No. of Students: 10

B.Sc. Medical Imaging Technology

No. of Students: 20

B.Sc Optometry

No. of Students: 20

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## Research Publications

1. Dattaraj, H.R., Sridhar, K.R., Jagadish, B.R. and Pavithra, M. 2020. Bioactive potential of the wild edible mushroom *Ramaria versatilis*. *Studies in Fungi* 5, 73-83.
2. Geetha S., Bhagya, B.S. and Sridhar, K.R. 2020. Impact of vermicompost on the productivity of two edible legumes. *Journal of New Biological Reports*. 9, 234-239.
3. Sridhar K. R. The fascinating world of Mushrooms. *Green Horizon*. 2020; Vol 1(1), 15-17.
4. Bhagya B. Sharma. The impact of the pandemic COVID-19 on the environment. *Green Horizon*. 2020; Vol 1(1), 36-39.
5. Geetha Suvarna, Bhagya B. Sharma. An analogy of *Canavalia* lectins by molecular phylogenetic characterization. *Journal of Proteins and Proteomics*. 2020; Vol 11(3), 193-203.
6. Kandikere Ramaiah Sridhar, and Bhagya Balakrishna Sharma. Bioactive compounds of Jack Beans (*Canavalia* Species). In book: Bioactive compounds in underutilized vegetables and legumes. Bioactive compounds in Underutilized Vegetables and Legumes, Reference series in Phytochemistry. Publisher: Springer Nature. July 2020.
7. Dattaraj, H.R., Sridhar, K.R. and Jagadish, B.R. 2020. Diversity and bioprospect significance of macrofungi in the scrub jungles of southwest India. In: Biodiversity and Biomedicine, 1st Edition. Öztürk, M., Egamberdieva, D. and Pešić, M. (Ed.), Elsevier, Academic Press, London, 235-246.
8. Sridhar, K.R. 2020. Dimensions, diversity and ecology of aquatic mycobiome. *KAVAKA - Transactions of the Mycological Society of India*. 54, 10-23.
9. Sridhar, K.R. and Pavithra, M. 2020. Bioprospect potential of gasteroid mushrooms of the genus *Astraeus*. In: New and Future Developments in Microbial Biotechnology and Bioengineering - Recent Advances in Application of Fungi and Fungal Metabolites. 1st Edition. Singh, J. and Gehlot, P. (Ed.). Elsevier BV, Amsterdam, 225-231.
10. Sridhar, K.R., Nagesh, H. and Sharathchandra, K. 2020. Assemblage and diversity of asexual fungi in 10 terrestrial damp leaf litters: Comparison of two incubation techniques. *Asian Journal of Mycology*. 3, 362-375.
11. Pavithra, M., Sridhar, K.R., Karun N. C. 2020. A note on functional properties of two edible wild mushrooms. *International Journal of Agricultural Technology* 16(5): 1165-1174.
12. Mahadevakumar, S. and Sridhar, K.R. 2020. Plant-microbes interaction: Current developments and future challenges. In: Advances in Plant Microbiome for Sustainable Agriculture: Functional Annotation and Future Challenges. Yadav, A.N., Rastegari, A.A., Yadav, N. and Kour, D. (Ed.), Springer Nature.
13. Geetha Suvarna, Ashwini Prabhu, Katheeraja Muhseena N and Bhagya B. Sharma. *In vitro* cytotoxicity and apoptotic effect of concanavalins from *Canavalia* spp. on breast carcinoma cells. *International Journal on Biological Sciences*. 2020; 11(1): 15-22.
14. Sridhar, K.R. and Pavithra, M. Bioactive compounds of Ceylon Spinach (*Talinum triangulare* (Jacq.) Wild.) In book: H. N. Murthy, K. Y. Paek (eds.), Bioactive Compounds in Underutilized Vegetables and Legumes, Reference Series in Phytochemistry. Publisher: Springer Nature Switzerland AG, 2020.

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## Guest Lectures



1. A guest lecture on general waste segregation and management was delivered by Dr. Bhagya B. Sharma on 24.02.2020 for the high school students of Dakshina Kannada Zilla Panchayath Higher Primary School, Deralakatte, Mangaluru.
2. A radio talk on “Effect of COVID-19 on Environment” was delivered by Dr. Bhagya B. Sharma on 14.05.2020. Akashavani, Mangaluru, 100.3 MHZ

3. A webinar on “Biodiversity documentation & conservation” was delivered on 05.06.2020 by Prof. Shishupala, Professor, Dept. of Microbiology, University of Davanagere.



4. A webinar on “Diversity of snakes in Karnataka” was delivered on 06.06.2020 by Prof. Shishupala Professor, Dept. of Microbiology, University of Davanagere.



5. A webinar on “Yogic Diet” was delivered on 24.06.2020 by Mr. Praveen Kumar, Hatha Yoga Teacher Nischala Yoga, Mangalore.

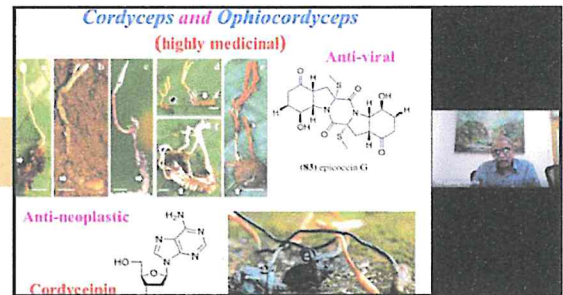


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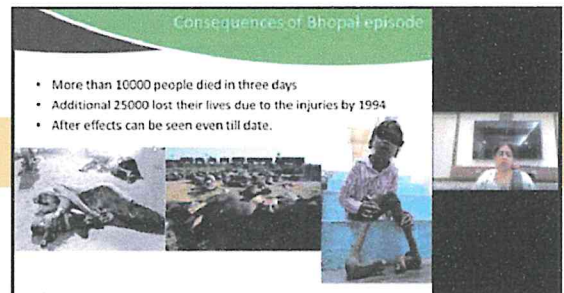
# Annual Report 2020

6. A webinar on “Mushrooms in human nutrition and health” was delivered by Dr. K. R. Sridhar on 15.07.2020 at Yenepoya (Deemed to be University).

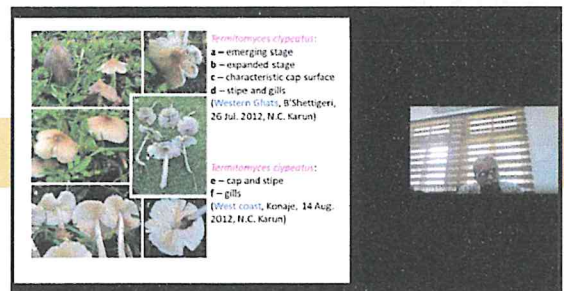


7. A radio talk on “Plastic waste management” was delivered by Dr. Bhagya B. Sharma on 04.09.2020. Manipal radio 90.2 MHz

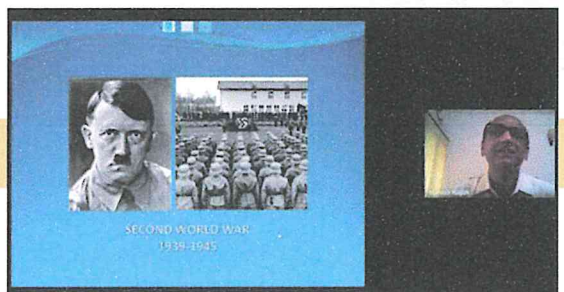
8. A webinar on “Understanding Environmental Laws”, for students of Yenepoya Institute of Arts, Science, Commerce and Management was delivered by Dr. Bhagya B. Sharma on 07.09.2020



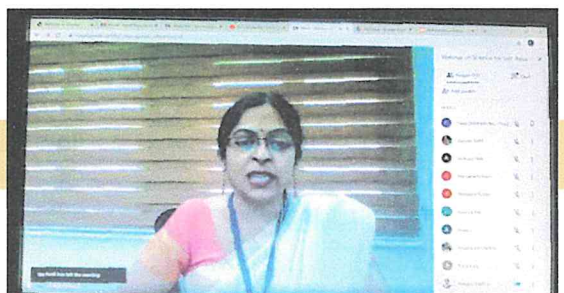
9. A webinar on “Fungal diversity - Significance, conservation and implications” was delivered by Dr. K. R. Sridhar on 28.11.2020 at Yenepoya (Deemed to be University).



10. A webinar on “Human rights” was delivered on 10.12.2020 by Mr. Mahesh Nayak, Executive Editor, Mangalore Today, English Monthly Magazine Mangaluru.



11. A webinar on “Self-Reliant India and Global Welfare” was delivered by Dr. Bhagya B. Sharma on 14.12.2020 organized by Ministry of Information and Broadcasting, Field Outreach Bureau: Mangaluru.



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## YENVIRON CLUB

### World Environment Day

05.06.2020

World Environment Day was observed by plantation of saplings. Saplings of *Artocarpus heterophyllus*, *Putranjiva roxburghii*, *Gmelina arborea* and *Calophyllum inophyllum* were planted in the campus.



### Vanamahotsava

30.06.2020

Vanamahotsava was celebrated by distributing vegetables seeds and cuttings of the medicinal and flowering plants of the campus to the staff of the university.



## HAPPENINGS

### Green Community Project

The Centre initiated a Green Community Project in 2019 which focuses on environmental conservation through community participation. This year 300 saplings (Neem, Mahagoni, Hole dasavala, Ashoka, Kakke mara, Jackfruit, Mango, Badam) collected from Forest Department were distributed in the community and planted during July - Sept 2020.

In Dabbilachil village, 53 saplings (Mahagoni, Hole dasavala, Kakke mara, Jackfruit, Mango, Badam) were planted on 04.09.2020.



Sapling plantation at Dabbilachil village

In Naringana village, 98 saplings (Mahagoni, Hole dasavala, Kakke mara, Jackfruit, Mango, Badam) were planted on 27.08.2020.



Sapling plantation at Naringana village

In Harekala village, 150 saplings (Mahagoni, Hole dasavala, Kakke mara, Jackfruit, Mango, Badam) were planted on 29.07.2020.



Sapling plantation at Harekala village

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## Training Programme

**24.08.2020 to 30.08.2020**

- ◆ Online training on “Understanding Environmental Laws for better Environmental Management” by Centre for Science and Environment, New Delhi.

**14.09.2020 to 27.09.2020**

- ◆ Online training on “Water audit and wastewater management in industries” by Centre for Science and Environment, New Delhi.

**20.10.2020**

- ◆ Lecture workshop on “Waste Management - Acts, Rules and Regulations” was organized with Mr. Madhu S. Manohar, Environmental Engineer, Mangalore City Corporation as the resource person.

## Green Horizon



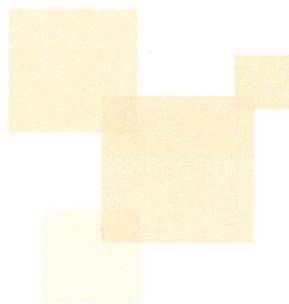
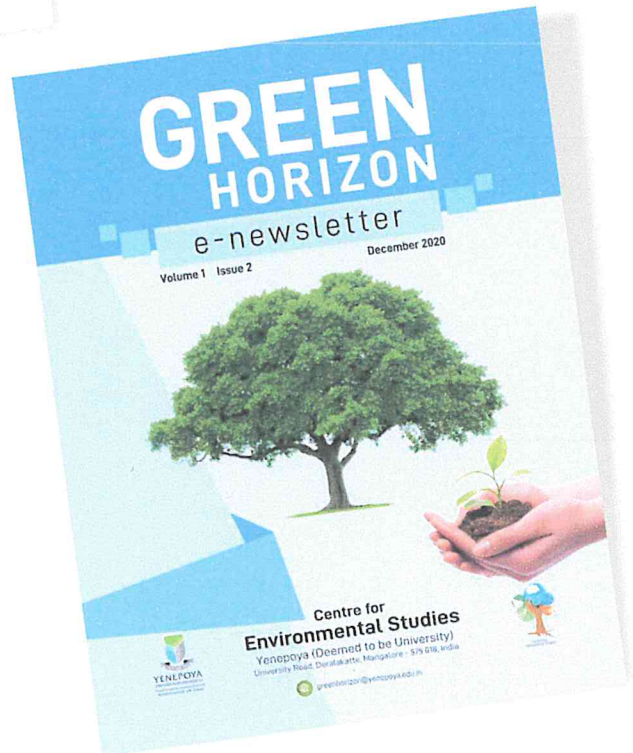
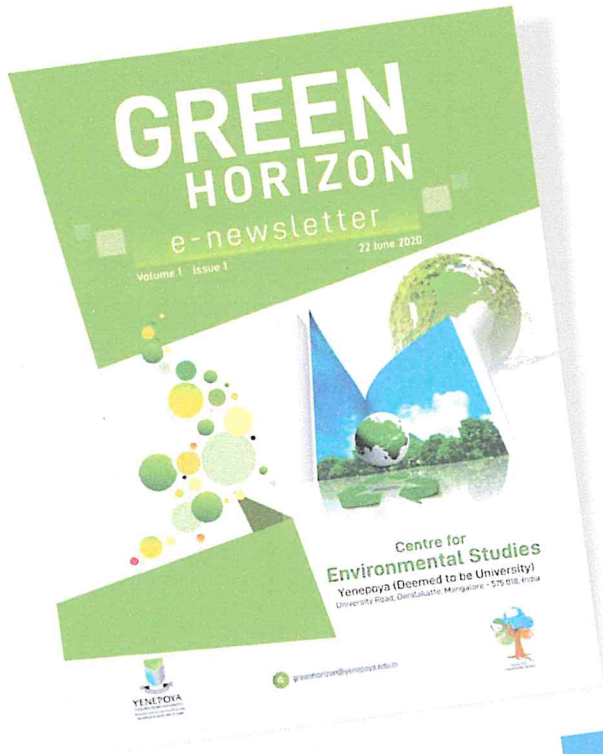
A half yearly E-News letter “GREEN HORIZON” was released by Hon'ble Vice Chancellor on 22.06.2020. The newsletter aims to encourage the faculty and students of the university to share articles, poems, current settings related to environment, health and recent advancements in science and technology. The second issue was released on 28.12.2020.

## Memorandum of Understanding (MoU)

A MoU was signed between the Centre for Environmental Studies, Yenepoya (Deemed to be University) and DNA Life Organization, Bangalore on 10.11.2020 for planting and green education. Both the parties will work on community forestry projects and environment awareness activities to train students, faculty and the community on gardening, plantation and enhance their green skills knowledge.

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# ENVIRONMENTAL MANAGEMENT SYSTEM

An Environmental Management System (EMS) is established to monitor activities of the university that have a bearing on the Environment. The Environmental performance of the university is reviewed for continual improvement. The university conducts environmental audit every year of the activities it is undertaking.

## 1. Environmental aspects of the institution activities

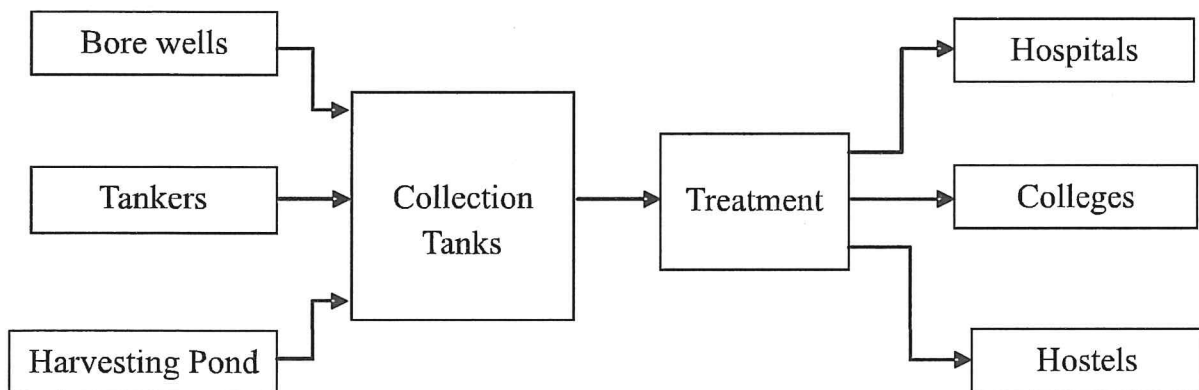
Various activities in the campus would lead to waste and waste water generation with varied degree of impacts. A representative table lists various activities, type of impacts and anticipated remedial actions expected (Table 1).

**Table1: Environmental aspects, impacts and actions of the university**

Sl. No.	Activity	Environmental aspects	Environmental impact	Remedial actions
1	Water Consumption	Waste water generation	Water & Land Pollution	Waste water treatment
2	Healthcare	Hazardous waste generation	Water & Land Pollution; Health Hazard	Scientific Disposal
3	Consumption of Food & Beverages	Waste Water Generation	Water & Land Pollution	Waste Water Treatment
		Solid Waste Generation	Water & Land Pollution	Scientific disposal
4	Operation of Diesel Generators	Flue Gas emission	Air Pollution	Chimney of standard specification
		Noise	Noise Pollution	Acoustic enclosure
5	Use of batteries	Hazardous waste - Lead	Water & Land Pollution	Buyback arrangement with the suppliers
		Plastic waste	Water & Land Pollution	Scientific Disposal
6	Usage of electronic items	Hazardous waste generation	Water & Land Pollution	Scientific Disposal

## 2. Water

Water is used for health care, drinking, laundry, kitchen, cleaning, gardening, bathing, toilets and restrooms. The University has a network of distribution lines for collection, storage and distribution of fresh water to all users in the campus (Fig 1).



**Fig 1. Flow chart of water treatment**

  
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The campus population includes students, faculty, staff, patients and their attendants and floating population among others. An efficient water management ensures all users receive water of desired quality, uninterrupted supply without wastage in the transit. Wastewater is generated from all the user locations with varied degree of pollution and handled scientifically in sewage treatment plants (Fig 2), as per the statutory requirements.



**Fig 2. Sewage treatment plant**

### 3. Air

Air emission sources are monitored periodically and records maintained with details of fuel consumptions and power generated. Chimneys with suitable height are provided as per the statutory requirements (Fig 3).



**Fig 3. Boiler and Chimney**

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## 4. Energy

As the activities of the university increase, energy needs also grow substantially. The university uses electrical energy from Mangalore Electricity Supply Company Limited (MESCOM) as well as the energy generated by diesel generators within the campus. A part of the power requirement is met by the use of solar energy (Fig 4). Energy audit is done regularly and emphasis is given on energy conservation.



**Fig 4. Power station and Solar panels**

## 5. Solid waste

Solid waste is collected at different locations in solid PVC bins (Fig 5) provided for both biodegradable and non-biodegradable wastes. The domestic waste collected is packed in black bags and taken to a common storage area for disposal. The waste is collected by authorized vendors from the Municipal Corporation. The hazardous biomedical waste packed in separate colour coded bags is stored in common collection site to be disposed daily through the authorized vendor.



**Fig 5. Bins to collect domestic waste in the campus**

## SUSTAINABLE PRACTICES

### 1. Water Conservation

- Flow meters are installed to monitor and control water consumption.
- Two rainwater harvesting ponds with a capacity of 3.5 crore litres and 1 crore litre capacity is maintained.
- 11 roof rainwater harvesting units are installed.
- About 25 trenches are constructed around the rainwater harvesting pond for percolation of rainwater and for recharge of underground water table.

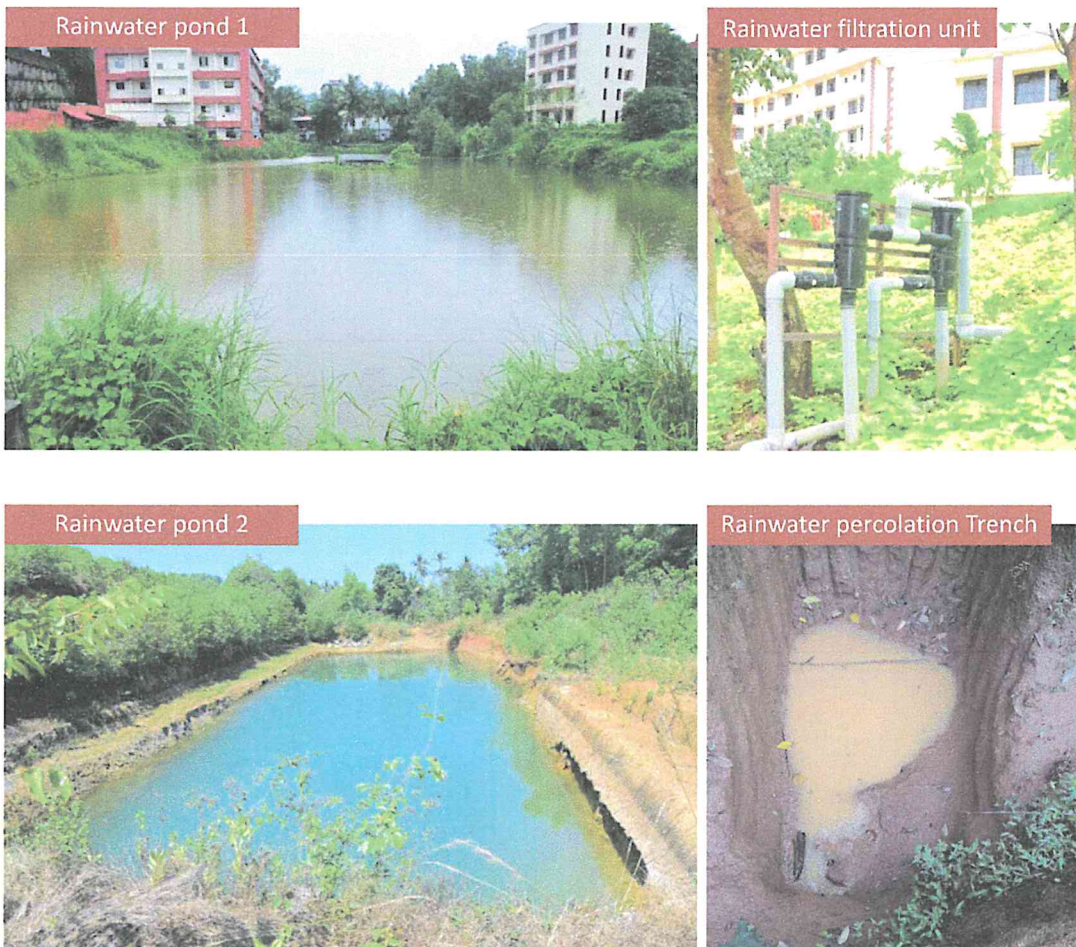


Fig 6. Rain water harvesting measures.

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## 2. Biodegradable Waste Recycling a) Vermicomposting

The university has in principle, taken up the waste management as a policy to reduce waste generation, waste segregation and recycle or reuse wherever applicable. Certain amount of garden waste along with vegetable waste and paper waste is recycled in the vermicompost unit (Fig 7). The unit is operated throughout the year as waste is available for composting. The compost, rich in nutrients, is used in campus gardens and also sold to generate value for the produce. There are six vermicompost units in the campus with a capacity of 400kg each. The total quantity of vermicompost produced in the year 2020 was 4274Kg.



**Fig 7. Vermicompost Unit and vermicompost**

## b) Pipe compost



**Fig 8. Pipe compost**

Pipe composting is carried out in PVC pipes with width of eight inches, buried vertically in 30 cm into the ground. Initially, a small amount of cow dung and jaggery is put in and later only kitchen waste is put into the pipe. Once in week sour buttermilk is added to expedite the bacterial decomposition process. The compost is removed by lifting the pipe after two months.

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## 3. Energy Consumption and Conservation

As the activities in the university increase, energy needs also grow substantially. It is very essential that there is enhanced attention towards energy conservation

- Hostels have water heaters powered by solar energy.
- University is in the process of replacing CFL bulbs with LED bulbs
- A Rooftop solar plant is installed for generation of electricity.

## 4. Sustainable practices in IT Department

IT Department can contribute substantially to reduce environmental impact. In collaboration with CES, the department strives to reduce pollution load. Such actions not only reduce environmental impact but also beneficial by cost reduction, time management, faster communication etc. The daily practices have an attributed carbon footprint, while excess carbon dioxide negatively impacts the natural environment. By becoming greener the carbon foot print may be reduced.

### E-Governance

- E-Governance is managed in the university at administration, services and support areas. It reduces the paper trail and also makes information tracking online with the click of a button.
- Management of human resources and communications are online including the leave application and approvals. Salary processing, as well as salary-slip decimation, happens online. Staff attendance is captured using biometric devices.
- University hospital operations are computerized and as a part of this, all patient medical records are managed in digital form. Patient care including IP/OP and ordering of lab and radiology tests and reporting, are processed and delivered digitally. Pharmacy prescriptions are also ordered online.
- All student data is managed online including the examination and result generation processes. Students attendance captured through biometric devices and summary of attendances sent to parents using SMS and email services. Student course work is delivered to students using the learning management system.
- An online issue tracking and reporting mechanism is implemented which takes care of issues raised to IT, Maintenance and biomedical sections of the university. All inventory of stock is managed on centralized software through which indenting for items and purchase is handled. Inventory, stock and asset control is managed through the software system.

IT Services section has successfully implemented the following initiatives:

- 1) Implementation of Electronic Medical Records
- 2) Sustainable Print Service
- 3) Computer system sleep management
- 4) Remote Access
- 5) Online learning/E-Learning
- 6) Procurement
- 7) PACS

- 1) Implementation of Electronic Medical Records

The use of an electronic medical records system offers these clinical advantages:

- No bulky paper records to store.
- Easier access to clinical data.
- The ability to establish and maintain effective clinical workflows.

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- Fewer medical errors, improved patient safety and stronger support for clinical decision-making.
  - Enhancing privacy and security of patient data.
  - Securely sharing electronic information with patients and other clinicians.
  - Ability to gather and analyse patient data that enables outreach to discreet populations.
  - The opportunity to interact seamlessly with affiliated hospitals, clinics, labs and pharmacies.
- 2) The Sustainable Print Service (SPS) has been implemented in various departments where the confidentiality of the document is confined to a designated group of employees. Shared printing services are used wherever possible.
  - 3) Most of the University PCs will go in to sleep mode after a defined period of inactivity based on the type of work assigned to them, reducing their energy usage.
  - 4) All computer systems in the campus are remotely accessible using VNC software and computer sleep policies are in place during operational hours. Wake on LAN allows our staff to switch on any PC in our network remotely, for remote working or troubleshooting wherever and whenever they want. Remote connection to University computer services and applications allow flexible access without the need to travel or keep PCs powered on.
  - 5) The ILIAS based online learning portal, offers opportunities to reduce the amount of printed material by viewing materials online. All the course content which used to be distributed using the paper has been replaced with online content. Assignments can be produced, submitted, marked and feedback given without the need to be printed out. Results and notices are put up online instead of paper based notices. These initiatives have also reduced paper consumption. University email accounts can be accessed using mail.yenepoya.edu.in and the full Outlook client can be configured for staff working from home. A shared file to access a shared content in the university network wherever required.VPN (virtual private network) allows user's access to University restricted services and applications that are not otherwise available.
  - 6) Procurement: Requests are sent online to the Purchase Department for procurement of various items from by all departments, thus reducing the use of paper.
  - 7) Implementation of PACS (picture archiving and communication systems):  
A Picture Archiving and Communication System (PACS) is a computerised mean of replacing the roles of conventional radiological film: images are acquired, stored, transmitted, and displayed digitally. When such a system is installed throughout the hospital, a filmless clinical environment is maintained.
    - Once an image has been acquired onto PACS it cannot be lost, stolen, or misfiled.
    - The numerous PACS terminals throughout the hospital allow simultaneous multi-location viewing of the same image, if desired, whereas conventional film can only physically exist in one place at any one time.
    - PACS does allow some direct economic savings from the lack of expenditure on film, film packets, film processing chemicals.

## Guidelines to staff and students on energy conservation

The staff and students are advised to adopt environment friendly methods in their activities to :

- **Save energy**

Turn off PC and monitor when not in use. Use VNC to switch on PC to work remotely when needed. Access almost everything on a University PC or an alternative computer at home or hostel using VPN as per need basis.

- **Reduce printing**

Using email/e-learning platform, to share electronic copies of employee manuals, safety documents and other shared material. Use a laptop or iPad in meetings. Use large screen display, to show the document in a meeting

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environment rather than print. Recycle old documents or reuse them for faxes, scrap paper or drafts.

- **Be energy efficient**

Save energy by supplying laptops instead of desktop PCs, they are more energy efficient. The use of video conferencing facilities and Skype reduces the need for travel. Online learning via ILIAS/Yengage can replace the need for face to face sessions reducing the need to travel.

- **Dispose the e-waste through an e-waste management company.**

IT department disposes all e-waste generated in the university using authorised e-waste collectors as per the regulations of the Karnataka State Pollution Control Board. All e-waste are collected and stored in a secure location and based on the quantity accumulated disposals are performed periodically.

- **Buy the right product**

IT Department provides guidance to make sure the faculty and students make the right purchasing decisions; provide Green Information, as well as equipment specification details on core equipment. An over-spec PC is not only more expensive to buy, it also costs much more on the run. LED monitors are more energy efficient than LCD monitors and cost less to use. Laptops are inherently more energy efficient.

## 5. Sustainable practices in Central Kitchen and Laundry

- **Central Kitchen**

The procurement and preparation of food – either in residential halls or as part of the campus commercial activities - can have significant impacts in terms of energy, water and waste generation. The university has a Central Kitchen which introduces sustainability into dining and catering services in several ways. Majority of items are bought from local producers which reduce 'food miles'. Menu is planned based on what is naturally available in the season to reduce the energy needed to produce, transport, and store food. Quality: Quantity ratio is balanced in order to reduce overall waste. One month advanced menu is prepared and software maintains the availability of the food items required for the menu. Large 250 litres' bulk cooking containers made of imported Japanese steel is used which retains freshness and nutrients of the vegetables. Where ever possible automation has been the key to facilitate bulk cooking, eg. Idiappam making, automated rice and dal washer, large scale cooking vessels for rice etc.

- **Laundry Line**

The University has its own laundry process units with a capacity of 7000 kg/day. It also provides all types of premium laundry services in and around the city of Mangalore to meet the customized demands of individual clients. The laundry team works with the latest technology and skilful practices for maximum efficiency, giving the end user the ultimate satisfaction. The laundry line caters to individual households, apartments, hospitals, educational institutions, hotels, student hostels and every kind of establishment that needs laundry services. The unit stands for superior quality service, pick up and drop facility, at affordable rates.

- **Use of hot water for cooking and laundry**

About 3000 L of water is heated for 3 hours and stored. This helps to reduce the water boiling time which will reduce gas consumption. Cooking is done in bulk 3 times a day to meet the requirement of 20,000 people every day. Rice boiling is with steamer which saves 50% of the cooking gas. Also, steam is used in dryers and for steam press machines in laundry. Steam is produced for cooking and laundry by using briquettes made out of coffee husk, saw dust etc. Due to its low moisture content and high density, briquettes have the higher practical thermal value and much lower ash content. Thus, use of fuel briquettes leads to green and pollution free environment.

- **Waste management**

Waste water from laundry and kitchen is collected and sent for recycling in effluent treatment plant and sewage treatment plant. The recycled water is used for irrigation or for toilet flush. Used oil is sent for sale. Coconut husk is used as fuel for burning thereby reducing gas consumption. Cardboard, tin, gunny bags are sent to recycle. Faulty refrigerators are either exchanged or sent to scrap.

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## BIODIVERSITY

Yenepoya University is one of the greenest Universities with extensive landscape which encourages biodiversity. The campus has grassland, individual and clumped trees, shrubs and grasses accounting for more than 308 plants species. Various organic practices manage our garden and support the local flora and fauna species. Horticulture green waste is used to produce compost and mulching materials. No pesticides or chemical fertilizers are used in the campus. Local drought tolerant plant species that host insects especially bees and butterflies are planted. There are around 25 bee hives at the campus. Flora and fauna auditing of the campus is done annually by subject experts. The list saplings planted in this year by students, staff and guests is given in table 2.

**Table 2: Plant-a-tree-program**

Date	Plant Name	No. of saplings planted
23.01.2020	<i>Prunus avium</i>	15
25.01.2020	<i>Nerium oleander</i>	39
03.02.2020	<i>Nerium oleander</i>	200
07.02.2020	<i>Syzygium campanulatum</i>	700
05.06.2020	<i>Artocarpus heterophyllus</i>	02
	<i>Putranjiva roxburghii</i>	03
	<i>Gmelina arborea</i>	02
	<i>Calophyllum inophyllum</i>	04
04.09.2020	<i>Swietenia mahagoni</i> <i>Lagerstroemia speciosa</i>	53
27.08.2020	<i>Cassia fistula</i> <i>Artocarpus heterophyllus</i>	98
29.07.2020	<i>Mangifera indica</i> <i>Terminalia catappa</i>	150



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## Flora of the campus

The Yenepoya University campus has a diverse collection of native and cultivated plants spread over 23 acres. The campus plant life is documented every year with the help of renowned taxonomist. This report lists the 308 species identified as 51 herbs, 68 shrubs, 20 climbers, 77 trees and 94 weeds.

## HERBS

1. *Achetaria azurea* (Linden) V.C. Souza [*Otacanthus caeruleus* Lindl.] – Plantaginaceae
2. *Achyranthes aspera* L.- Amaranthaceae
3. *Acorus calamus* L. – Acoraceae
4. *Aerva lanata* (L.) Juss. ex Schult – Amaranthaceae
5. *Aloe vera* (L.) Burm. f. – Xanthorrhoeaceae
6. *Alpinia purpurata* (Vieill.) K. Schum. – Zingiberaceae
7. *Alpinia calcarata* (Haw.) Roscoe - Zingiberaceae
8. *Alternanthera bettzickiana* (Regel) G. Nicholson
9. *Andrographis paniculata* (Burm. f.) Wall. ex Nees – Acanthaceae
10. *Bacopa monnieri* (L.) Pennell – Plantaginaceae
11. *Boerhavia diffusa* L. – Nyctaginaceae
12. *Caladium bicolor* (Aiton) Vent. – Araceae
13. *Calathea zebrina* (Sims) Lindl. – Marantaceae
14. *Catharanthus roseus* (L.) G. Don. – Apocynaceae
15. *Centella asiatica* (L.) Urban – Apiaceae
16. *Chrysothemis pulchella* (Donn ex Sims) Decne. – Gesneriaceae
17. *Clinacanthus nutans* (Burm.f.) Lindau – Acanthaceae
18. *Coleus amboinicus* Lour. – Lamiaceae
19. *Costus pictus* D. Don – Costaceae
20. *Curcuma longa* L. – Zingiberaceae
21. *Cyperus rotundus* L. – Cyperaceae
22. *Dieffenbachia amoena* Bull. – Araceae
23. *Eclipta prostrata* (L.) L. – Asteraceae
24. *Etingera elatior* (Jack) R.M. Sm. [*Phaeomeria magnifica* (Roscoe) K. Schum] – Zingiberaceae
25. *Gerbera* sp. – Asteraceae
26. *Heliconia psittacorum* L.f. – Heliconiaceae
27. *Heliconia rostrata* Ruiz & Pav. – Heliconiaceae
28. *Hemigraphis colorata* W. Bull. – Acanthaceae
29. *Hymenocallis littoralis* (Jacq.) Salisb. – Amaryllidaceae
30. *Ipomoea batatas* (L.) Poir. – Convolvulaceae
31. *Impatiens balsamina* L. - Balsaminaceae
32. *Leucas lavandulifolia* Sm. – Lamiaceae
33. *Maranta arundinacea* L. – Marantaceae
34. *Musa paradisiaca* L. – Musaceae
35. *Nephrolepis exaltata* (L.) Schott – Lomariopsidaceae [Fern]
36. *Ocimum tenuiflorum* L. – Lamiaceae
37. *Ophiopogon japonicus* (Thunb.) Ker Gawl. – Asparagaceae
38. *Phyllanthus amarus* Schum & Thonn. – Phyllanthaceae
39. *Philodendron* 'Green emerald' - Araceae
40. *Plumbago zeylanica* L.- Plumbaginaceae
41. *Ruellia simplex* C. Wright – Acanthaceae
42. *Spathiphyllum* sp. – Araceae
43. *Spathoglottis plicata* Blume – Orchidaceae
44. *Syngonium podophyllum* Schott - Araceae
45. *Tradescantia spathacea* Sw. [*Rhoeo discolor* (L'Her.) Hance] – Commelinaceae
46. *Tradescantia zebrina* (Schinz) D.R. Hunt – Commelinaceae
47. *Vernonia cinerea* (L.) Less. – Asteraceae
48. *Vetiveria zizanioides* (L.) Nash – Poaceae
49. *Wedelia trilobata* (L.) Hitchc. – Asteraceae
50. *Xanthosoma sagittifolium* (L.) Schott - Araceae
51. *Zephyranthes carinata* Herb. – Amaryllidaceae

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## SHRUBS

1. *Acalypha hispida* Burm.f. – Euphorbiaceae
2. *Acalypha wilkesiana* Muell.-Arg. –Euphorbiaceae
3. *Adhatoda zeylanica* Medikus– Acanthaceae
4. *Asparagus densiflorus* (Kunth) Jessop - Asparagaceae
5. *Bambusa heterostachya* (Munro) Holttum –Poaceae
6. *Barleria cristata* L. – Acanthaceae
7. *Bauhinia acuminata* L. – Fabaceae
8. *Bauhinia tomentosa* L. – Fabaceae
9. *Bixa orellana* L. – Bixaceae
10. *Caesalpinia pulcherima* (L.) Sw. – Fabaceae
11. *Calotropis gigantea* (L.) R. Br.- Apocynaceae
12. *Carissa spinarum* L. - Apocynaceae
13. *Clerodendrum inerme* (L.) Gaertn. – Lamiaceae
14. *Codiaeum variegatum* (L.) Rumph. ex A. Juss. – Euphorbiaceae
15. *Cordyline fruticosa* (L.) A. Chev. [*C. terminalis* Kunth] – Asparagaceae
16. *Cuphea hyssopifolia* Kunth - Lythraceae
17. *Dracaena braunii* Engl. [*D. sanderiana* Sander] – Asparagaceae
18. *Dracaena godseffiana* Mast. – Asparagaceae
19. *Dracaena reflexa* Lam. – Asparagaceae
20. *Duranta erecta* L. [*D. plumieri* Jacq.] – Verbenaceae
21. *Euphorbia milii* Des Moul. – Euporbiaceae
22. *Euphorbia trigona* Mill. - Euphorbiaceae
23. *Excoecaria cochinchinensis* Lour. – Euphorbiaceae
24. *Gardenia jasminoides* Ellis – Rubiaceae
25. *Graptophyllum pictum* (L.) Griff. – Acanthaceae
26. *Hamelia patens* Jacq. – Rubiaceae
27. *Hibiscus rosa-sinensis* L. - Malvaceae
28. *Hibiscus schizopetalus* (Dyer) Hook.f. – Malvaceae
29. *Hydrangea macrophylla* (Thunb.) Ser. – Hydrangeaceae
30. *Ixora finlaysoniana* Wall. ex G. Don – Rubiaceae
31. *Ixora* sp. – Rubiaceae
32. *Jatropha curcas* L. – Euporbiaceae
33. *Jatropha gossipifolia* L. – Euporbiaceae
34. *Jatropha pandurifolia* Andr. - Euphorbiaceae
35. *Lagerstroemia indica* L. – Lythraceae
36. *Lantana camara* L. – Verbenaceae
37. *Lantana montevidensis* (Spreng.) Briq. - Verbenaceae
38. *Lawsonia inermis* L. – Lythraceae
39. *Leea indica* (Burm.f.) Merr. - Vitaceae
40. *Malvaviscus penduliflorus* DC. – Malvaceae
41. *Melicope denhamii* (Seem.) T.G. Hartley – Rutaceae
42. *Morinda citrifolia* L. – Rubiaceae
43. *Mussaenda philippica* A. Rich. – Rubiaceae
44. *Osmoxylon lineare* (Merr.) Philipson – Araliaceae
45. *Phyllanthus myrtifolius* (Wight) Muell.-Arg. – Phyllanthaceae
46. *Pisonia umbellifera* (J.R. Forst. & G. Forst.) Seem – Nyctaginaceae
47. *Polyscias filicifolia* (C. Moore ex E. Fourn.) L.H. Bailey – Araliaceae
48. *Polyscias guilfoylei* (W. Bull) L.H. Bailey – Araliaceae
49. *Polyscias paniculata* (DC.) Baker – Araliaceae
50. *Polyscias scutellaria* (Burm.f.) Fosberg – Araliaceae
51. *Premna serratifolia* L. [*Premna obtusifolia* R. Br.] – Lamiaceae
52. *Pseuderanthemum carruthersii* (Seem.) Guillaumin [*P. atropurpureum* (W. Bull.) Radlk.
53. *Punica granatum* L. – Lythraceae
54. *Rauvolfia serpentina* (L.) Benth.ex Kurz – Apocynaceae
55. *Rhapis excels* (Thunb.) A. Henry ex Rehder – Arecaceae
56. *Ricinis communis* L. – Euporbiaceae
57. *Rosa* sp. – Rosaceae
58. *Russelia equisetiformis* Schltld. – Plantaginaceae
59. *Sanchezia nobilis* Hook.f. – Acanthaceae
60. *Schefflera arboricola* (Hayata) Kanehira - Araliaceae
61. *Solanum torvum* Sw. – Solanaceae
62. *Tabernaemontana divaricata* (L.) R.Br. ex Roem. & Schult. –Apocynaceae
63. *Tephrosia purpurea* (L.) Pers. – Fabaceae
64. *Turnera subulata* Sm. – Passifloraceae
65. *Turnera ulmifolia* L. - Passifloraceae
66. *Vitex negundo* L. – Lamiaceae
67. *Woodfordia fruticosa* (L.) Kurz – Lythraceae
68. *Wrightia antidysenterica* (L.) R. Br. – Apocynaceae

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## CLIMBERS

1. *Acacia caesia* (L.) Willd. – Fabaceae
2. *Allamanda blanchetii* A. DC. [*A. violacea* Gardner] – Apocynaceae
3. *Allamanda cathartica* L. – Apocynaceae
4. *Antigonon leptopus* Hook. & Arn. – Polygonaceae
5. *Asparagus racemosus* Willd. - Asparagaceae
6. *Bougainvillea buttiana* Holtum & Standey – Nyctaginaceae
7. *Cissus repanda* Vahl – Vitaceae
8. *Clematis gouriana* Roxb. ex DC. – Ranunculaceae
9. *Clerodendrum splendens* G. Don – Lamiaceae
10. *Clitoria ternatea* L. – Fabaceae
11. *Coscinium fenestratum* (Gartn.) Colebr. – Menispermaceae
12. *Epipremnum pinnatum* (L.) Engl. Cv. 'Aureum' - Araceae
13. *Hemidesmus indicus* (L.) R. Br. – Apocynaceae
14. *Lonicera japonica* Thunb. – Caprifoliaceae
15. *Mussaenda laxa* (Hook.f.) Hutch. ex Gamble – Rubiaceae
16. *Piper longum* L.- Piperaceae
17. *Quisqualis indica* L. – Combretaceae
18. *Thunbergia fragrans* Roxb. – Acanthaceae
19. *Thunbergia grandiflora* (Roxb. ex Rottl.) Roxb. – Acanthaceae
20. *Tinospora cordifolia* (Willd.) Miers – Menispermaceae

## TREES

1. *Acacia auriculiformis* Benth. – Fabaceae
2. *Acacia mangium* Willd. – Fabaceae
3. *Aegle marmelos* (L.) Correa – Rutaceae
4. *Ailanthus triphysa* (Dennst.) Alston – Simaroubaceae
5. *Albizia saman* (Jacq.) Merr. [*Samanea saman* (Jacq.) Merr.] – Fabaceae
6. *Alstonia scholaris* (L.) R. Br. – Apocynaceae
7. *Annona muricata* L. – Annonaceae
8. *Aphanamixis polystachya* (Wall.) R. N. Parker – Meliaceae
9. *Areca catechu* L. - Arecaceae
10. *Artocarpus heterophyllus* Lam. – Moraceae
11. *Artocarpus hirtus* Lam. – Moraceae
12. *Azadirachta indica* A. Juss.- Meliaceae
13. *Bambusa vulgaris* Schrad. – Poaceae
14. *Brownia coccinea* Jacq. – Fabaceae
15. *Butea monosperma* (Lam.) Taub. – Fabaceae
16. *Callistemon citrinus* (Curtis) Skeels [*C. lanceolatus* (Sm.) DC.] - Myrtaceae
17. *Carica papaya* L. – Caricaceae
18. *Caryota urens* L. – Arecaceae
19. *Cassia fistula* L. – Fabaceae
20. *Cassia roxburghii* DC. [*C. marginata* Roxb.] – Fabaceae
21. *Citrus aurantifolia* (Christm. & Panz.) Swingle – Rutaceae
22. *Cochlospermum religiosum* (L.) Alston - Bixaceae
23. *Cocos nucifera* L. – Arecaceae
24. *Cyrtostachys renda* Blume – Arecaceae [Red palm]
25. *Dalbergia latifolia* Roxb. – Fabaceae
26. *Delonix regia* (Hook.) Raf. – Fabaceae
27. *Drypetes roxburghii* (Wall.) Hurusawa – Putranjivaceae
28. *Dypsis lutescens* (H. Wendl.) Beentje & J. Dransf. – Arecaceae
29. *Elaeocarpus ganitrus* Roxb. Ex G. Don – Elaeocarpaceae
30. *Erythrina variegata* L. [*E. indica* Lam.] – Fabaceae
31. *Ficus benjamina* L. – Moraceae
32. *Ficus racemosa* L. – Moraceae
33. *Ficus religiosa* L. – Moraceae
34. *Flacourtia montana* J. Graham – Salicaceae
35. *Garcinia indica* (Thouars) Choisy – Clusiaceae
36. *Gmelina arborea* L. – Lamiaceae
37. *Grevillea robusta* Cunn. ex R. Br. – Proteaceae
38. *Hopea ponga* (Dennst.) Mabb.- Dipterocarpaceae
39. *Lagerstroemia speciosa* (L.) Pers. – Lythraceae

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40. *Livistona rotundifolia* (Lam.) Mart. – Arecaceae
41. *Macaranga peltata* (Roxb.) Muell. -Arg. – Euphorbiaceae
42. *Magnolia champaca* (L.) Baill. ex Pierre [*Michelia champaka* L.] – Magnoliaceae
43. *Mangifera indica* L. – Anacardiaceae
44. *Melaleuca leucadendron* L. – Myrtaceae
45. *Mesua ferrea* L. – Calophyllaceae
46. *Mimusops elengi* L. – Sapotaceae
47. *Moringa oleifera* Lam. – Moringaceae
48. *Muntingia calabura* L. – Muntingiaceae
49. *Myristica malabarica* Lam. – Myristicaceae
50. *Neolamarckia cadamba* (Roxb.) Bosser – Rubiaceae
51. *Nephelium lappaceum* L. – Sapindaceae
52. *Persea macrantha* (Nees) Kosterm. – Lauraceae
53. *Phyllanthus emblica* L. – Phyllanthaceae
54. *Phyllanthus acidus* (L.) Skeels – Phyllanthaceae
55. *Pimenta dioica* (L.) Merr. – Myrtaceae
56. *Plumeria obtusa* L. – Apocynaceae
57. *Plumeria rubra* L. – Apocynaceae
58. *Polyalthia longifolia* (Sonn.) Thwaites – Annonaceae
59. *Prosopis cineraria* (L.) Druce - Fabaceae
60. *Pterocarpus marsupium* Roxb. – Fabaceae
61. *Ptychosperma macarthurii* (H. Wendl. ex H.J. Veitch) H. Wendl. & Hook.f. - Arecaceae
62. *Roystonea regia* (Kunth) O.F. Cook – Arecaceae
63. *Santalum album* L. – Santalaceae
64. *Saraca asoca* (Roxb.) Willd. – Fabaceae
65. *Schefflera actinophylla* (Endl.) Harms [*Brassia actinophylla* Endl.] - Araliaceae
66. *Senna siamea* (Lam.) H.S. Irwin & Barneby [*Cassia siamea* Lam.] – Fabaceae
67. *Spathodea campanulata* P. Beauv. – Bignoniaceae
68. *Swietenia macrophylla* King – Meliaceae
69. *Syzygium cumini* (L.) Skeels – Myrtaceae
70. *Syzygium jambos* (L.) Alston – Myrtaceae
71. *Syzygium samarangense* (Blume) Merr. & L.M. Perry – Myrtaceae
72. *Tabebuia aurea* (Silva Manso) Benth. & Hook.f. ex S. Moore [*T. argentea* (Bureau & K. Schum.) Britton – Bignoniaceae
73. *Terminalia arjuna* (Roxb.) Wight & Arn. – Combretaceae
74. *Terminalia catappa* L. – Combretaceae
75. *Terminalia chebula* Retz. - Combretaceae
76. *Thevetia peruviana* (Pers.) K. Schum. – Apocynaceae
77. *Wrightia tinctoria* (Roxb.) R. Br. - Apocynaceae

## WEEDS

1. *Adiantum lunulatum* Burm. - Pteridaceae
2. *Ageratum conyzoides* L. - Asteraceae
3. *Alternanthera ficoidea* (L.) Sm. - Amaranthaceae
4. *Alysicarpus bupleurifolius* (L.) DC. - Fabaceae
5. *Alysicarpus vaginalis* (L.) DC. - Fabaceae
6. *Amaranthus hybridus* L. - Amaranthaceae
7. *Asystasia variabilis* Trimen - Acanthaceae
8. *Axonopus compressus* (Sw.) P. Beauv. – Poaceae
9. *Blumea* sp. - Asteraceae
10. *Brachiaria subquadripara* (Trin.) Hitchc. – Poaceae
11. *Cheilanthes tenuifolia* (Burm.f.) Sw. – Pteridaceae
12. *Cheilocostus speciosus* (J. Koenig) C. Specht – Costaceae
13. *Chloris barbata* Sw. – Poaceae
14. *Christella dentata* (Forssk.) Brownsey & Jermy – Thelypteridaceae
15. *Cleome rutidosperma* DC. - Cleomaceae
16. *Colocasia esculenta* (L.) Schott - Araceae
17. *Commelina diffusa* Burm.f. – Commelinaceae
18. *Crotalaria pallida* Aiton – Fabaceae
19. *Cuscuta chinensis* Lam. - Convolvulaceae
20. *Cyanotis cristata* (L.) D. Don - Commelinaceae
21. *Cyanthillium cinereum* (L.) H. Rob. - Asteraceae
22. *Cynodon dactylon* (L.) Pers. - Poaceae
23. *Cyperus compressus* L. – Cyperaceae
24. *Cyperus distans* L.f. - Cyperaceae
25. *Cyperus iria* L. - Cyperaceae
26. *Cyperus rotundus* L. - Cyperaceae
27. *Cyperus squarrosus* L. - Cyperaceae
28. *Dactyloctenium aegyptium* (L.) Willd. - Poaceae
29. *Desmodium scorpiurus* (Sw.) Desv. - Fabaceae
30. *Desmodium triflorum* (L.) DC. - Fabaceae
31. *Digitaria bicornis* (Lam.) Roem. &Schult. - Poaceae
32. *Digitaria longiflora* (Retz.) Pers. - Poaceae


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33. *Digitaria setigera* Roth – Poaceae
34. *Diploclisia glaucescens* (Blume) Diels - Cucurbitaceae
35. *Drynaria quercifolia* (L.) J. Sm. - Polypodiaceae
36. *Echinochloa colona* (L.) Link - Poaceae
37. *Eclipta prostrata* (L.) L. - Asteraceae
38. *Elatostema cuneatum* Wight - Urticaceae
39. *Eleusine indica* (L.) Gaertn. -Poaceae
40. *Elytranthe parasitica* (L.) Danser - Loranthaceae
41. *Emilia sonchifolia* (L.) DC. - Asteraceae
42. *Eragrostis amabilis* (L.) Wight & Arn. – Poaceae
43. *Eragrostis nutans* (Retz.) Nees ex Steud. – Poaceae
44. *Eragrostis uniolooides* (Retz.) Nees ex Steud. - Poaceae
45. *Euphorbia hirta* L. - Euphorbiaceae
46. *Evolvulus alsinoides* (L.) L. - Convolvulaceae
47. *Evolvulus nummularius* (L.) L. - Convolvulaceae
48. *Fimbristlis dichotoma* (L.) Vahl - Cyperaceae
49. *Hybanthus enneaspermus* (L.) F. Muell. – Violaceae
50. *Impatiens minor* (DC.) Bennet – Balsaminaceae
51. *Ipomoea triloba* L. - Convolvulaceae
52. *Kyllinga brevifolia* Rottb. - Cyperaceae
53. *Kyllinga nemoralis* (J.R. Forst. & G. Forst.) Dandy - Cyperaceae
54. *Laportea interrupta* (L.) Chew – Urticaceae
55. *Lindernia antipoda* (L.) Alston – Linderniaceae
56. *Lindernia ciliata* (Colsm.) Pennell – Linderniaceae
57. *Lindernia crustacea* (L.) F. Muell. – Linderniaceae
58. *Ludwigia hyssopifolia* (G. Don) Exell - Onagraceae
59. *Mecardonia procumbens* (Mill.) Small - Plantaginaceae
60. *Mimosa pudica* L. – Fabaceae
61. *Mitracarpus hirtus* (L.) DC. - Rubiaceae
62. *Mucuna pruriens* (L.) DC. - Fabaceae
63. *Murdannia nudiflora* (L.) Brenan - Commelinaceae
64. *Oldenlandia corymbosa* L. – Rubiaceae
65. *Osbeckia muralis* Naudin – Melastomataceae
66. *Oxalis corniculata* L. – Oxalidaceae
67. *Panicum repens* L. – Poaceae
68. *Pepromia pellucida* (L.) Kunth – Piperaceae
69. *Phyllanthus amarus* Schumach. & Thonn. – Phyllanthaceae
70. *Phyllanthus debilis* Klein ex Willd. – Phyllanthaceae
71. *Phyllanthus tenellus* Roxb. - Phyllanthaceae
72. *Phyllanthus urinaria* L. – Phyllanthaceae
73. *Phyllanthus virgatus* G. Forst. – Phyllanthaceae
74. *Physalis angulata* L. - Solanaceae
75. *Pilea microphylla* (L.) Liebm. – Urticaceae
76. *Pityrogramma calomelanos* (L.) Link – Pteridaceae
77. *Pogonatherum crinitum* (Thunb.) Kunth – Poaceae
78. *Pteris confusa* T.G. Walker – Pteridaceae
79. *Pteris vittata* L. - Pteridaceae
80. *Pycnus pumilus* (L.) Nees – Cyperaceae
81. *Rotala malampuzhensis* Nair ex C.D.K. Cook - Lythraceae
82. *Rungia pectinata* (L.) Nees - Acanthaceae
83. *Scoparia dulcis* L. – Plantaginaceae
84. *Selaginella ciliaris* (Retz.) Spring - Selaginellaceae
85. *Sida alnifolia* L. - Malvaceae
86. *Spermacoce exilis* (L.O. Williams) C.D. Adams ex W.C. Burger & C.M. Taylor - Rubiaceae
87. *Sporobolus diandrus* (Retz.) P. Beauv. - Poaceae
88. *Sporobolus tenuissimus* (Schränk.) Kuntze - Poaceae
89. *Stemodia verticillata* (Mill.) Hassl. – Plantaginaceae
90. *Stylosanthes humilis* Kunth - Fabaceae
91. *Synedrella nodiflora* (L.) Gaertn. - Asteraceae
92. *Tridax procumbens* L. - Asteraceae
93. *Urena sinuata* L. - Malvaceae
94. *Zoysia matrella* (L.) Merr. - Poaceae

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## Medicinal plant garden

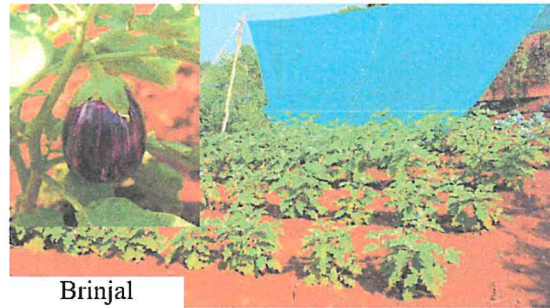
The medicinal plant garden is spread over half an acre and displays about 60 species of medicinal plants. The plants are grown in brick enclosures which resemble the various parts of human body. All the plants are labeled with their scientific name, local name, parts used and their medicinal properties.



## Vegetable garden



Tomato



Brinjal



Chilly



Okra



Cabbage



Ivy gourd

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## Fauna of the campus

The fauna of the campus is being documented by experts. This report lists 84 invertebrates and 51 vertebrates. Birds and butterflies are important indicators of the environmental health. In the campus 54 species of butterflies and 31 species of birds were found which indicates good environmental conditions.

### Invertebrates

Sl. No	Name of species	Common name
1	<i>Harpaphe haydeniana</i> Wood	Yellow spotted millipede
2	<i>Trigoniulus corallines</i>	Gervias Rusty millipede
3	<i>Nephila pilipes</i>	Gaint orb spider
4	<i>Argiope</i> sp	Yellow garden spider
5	<i>Bavia</i> sp	Jumping spider
6	<i>Tetragnatha</i> sp	Long jaw spider
7	<i>Cyrtarachne keralensis</i>	Orb-weaver spider
8	<i>Menemerus bivittatus</i>	Grey wall jumper
9	<i>Myrmarachne</i> sp	Ant mimiking spider
10	<i>Phidippus</i> sp	Jumping spider
11	<i>Aethriamanta brevipennis</i>	Scarlet marsh hawk
12	<i>Neurothemis fulvia</i>	Fulvous forest skimmer
13	<i>Neurothemis tullia</i>	Pied paddy skimmer
14	<i>Rhyothemis variegata</i>	Common picture wing
15	<i>Trithemis pallidinervis</i>	Long-legged marsh skimmer
16	<i>Ictinogomphus rapax</i>	Common clubtail
17	<i>Copera marginipes</i>	Yellow bush dart
18	<i>Periplaneta americana</i>	Cockroach
19	<i>Mantis religiosa</i>	Pray mantis
20	<i>Oryctes rhinoceros</i>	Coconut rhinoceros beetle
21	<i>Holotrichia</i> sp	White grubs
22	<i>Copris</i> sp	Dung beetle
23	<i>Musca domestica</i>	House fly
24	<i>Aedes</i> sp	Mosquito
25	<i>Anopheles</i> sp	Mosquito
26	<i>Telicota ancilla</i>	Dark palm dart
27	<i>Suastus gremius</i>	Indian palm bob
28	<i>Tagiades litigiosa</i>	Water snow flat
29	<i>Tagiades gana</i>	Suffused snow flat
30	<i>Borbo cinnara</i>	Rice swift
31	<i>Iambrix salsala</i>	Chestnut bob
32	<i>Aeromachus pygmaeus</i>	Pygmy scrub hopper
33	<i>Sancus fuligo</i>	Coon
34	<i>Papilio polytes</i>	Common mormon
35	<i>Graphium agamemnon</i>	Tailed jay

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36	<i>Graphium sarpedon</i>	Common bluebottle
37	<i>Papilio demoleus</i>	Lime butterfly
38	<i>Chilasa clytia</i>	Common mime
39	<i>Papilio polymnestor</i>	Blue mormon
40	<i>Atrophaneura aristolochiae</i>	Common rose
41	<i>Triodes minos</i>	Southern birdwing
42	<i>Catopsilia pomona</i>	Common emigrant
43	<i>Eurema hecabe</i>	Common grass yellow
44	<i>Eurema blanda</i>	Three spot grass yellow
45	<i>Delias eucharis</i>	Common jezebel
46	<i>Pareronia valeria</i>	Psyche
47	<i>Arhopala pseudocentaurus</i>	Centaur oakblue
48	<i>Surendra quercetorum</i>	Common acacia blue
49	<i>Prosotas nora</i>	Common lineblue
50	<i>Jamides celeno</i>	Common cerulean
51	<i>Caleta caleta</i>	Angled pierrot
52	<i>Catalius rosimon</i>	Common pierrot
53	<i>Acytolepis puspa</i>	Common hedge blue
54	<i>Neopithecops zalamora</i>	Quaker
55	<i>Spindasis vulcanus</i>	Common silverline
56	<i>Bindahara phocides</i>	Plane
57	<i>Zizina otis</i>	Lesser grass blue
58	<i>Euploea core</i>	Common crow
59	<i>Tirumala septentrionis</i>	Dark blue tiger
60	<i>Danaus chrysippus</i>	Plain tiger
61	<i>Danaus genutia</i>	Striped tiger
62	<i>Mycalesis perseus</i>	Common bushbrown
63	<i>Ypthima huebneri</i>	Common fourring
64	<i>Orsotrioena medus</i>	Nigger
65	<i>Melanitis leda</i>	Common evening brown
66	<i>Cupa erymanthis</i>	Rustic
67	<i>Elymnias hypermnesrta</i>	Common palmfly
68	<i>Cirrochroa thais</i>	Tamil yeoman
69	<i>Acraea violae</i>	Tawny coster
70	<i>Moduza procris</i>	Commander
71	<i>Euthalia aconthea</i>	Common baron
72	<i>Parthenos sylvia</i>	Clipper
73	<i>Junonia atlites</i>	Grey pansy
74	<i>Junonia iphita</i>	Chocolate pansy

75	<i>Junonia lemonias</i>	Lemon pansy
76	<i>Hypolimnas bolina</i>	Great eggfly
77	<i>Ariadne merione</i>	Common castor
78	<i>Ariadne ariadne</i>	Angled castor
79	<i>Neptis hylas</i>	Common sailor
80	<i>Vespa</i> sp	Paper wasps
81	<i>Apis</i> sp	Honey bee
82	<i>Oecophylla</i> sp	Weaver ant
83	<i>Camponotus</i> sp	Carpenter ant
84	<i>Odontomachus heamatodus</i>	Trap jaw ants

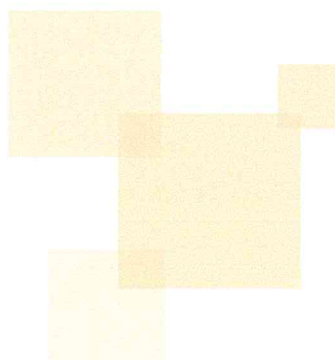
### Vertebrates

Sl. No	Name of species	Common name
1	<i>Duttaphrynus melanostictus</i>	Common indian toad
2	<i>Hoplobatrachus tigerinus</i>	Indian bull frog
3	<i>Euphlyctis cyanophlyctis</i>	Common skittering frog
4	<i>Pseudophilautus wynaadensis</i>	Wayanad bush frog
5	<i>Eutropis allapallensis</i>	Common skink
6	<i>Calotes versicolor</i>	Garden lizard
7	<i>Hemidactylus frenatus</i>	Common house gecko
8	<i>Ptyas mucosa</i>	Indian rat snake
9	<i>Dendrelaphis tristis</i>	Bronze back tree snake
10	<i>Ahaetulla nasuta</i>	Green vine snake
11	<i>Amphiesma stolatum</i>	Striped keelback
12	<i>Coelognathus helena</i>	Common trinket snake
13	<i>Corvus splendens</i>	House crow
14	<i>Orthotomus sutorius</i>	Common tailor bird
15	<i>Cinnyris asiaticus</i>	Loten's sunbird
16	<i>Leptocoma zeylonica</i>	Purple-rumped sunbird
17	<i>Acridotheres tristis</i>	Common myna
18	<i>Pycnonotus cafer</i>	Red vented bulbul
19	<i>Pycnonotus jocosus</i>	Red whiskered bulbul
20	<i>Motacilla maderaspatensis</i>	White browed wagtail
21	<i>Passer domesticus</i>	House sparrow
22	<i>Copsychus saularis</i>	Oriental magpie robin

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23	<i>Turdoides striata</i>	Jungle babbler
24	<i>Dicaeum erythrorhynchos</i>	Pale billed flower pecker
25	<i>Dendrocitta vagabunda</i>	Rufous treepie
26	<i>Dicrurus macrocercus</i>	Black drongo
27	<i>Haliastur indus</i>	Brahminy kite
28	<i>Milvus migrans</i>	Black kite
29	<i>Halcyon smyrnensis</i>	White breasted kingfisher
30	<i>Alcedo atthis</i>	Small blue kingfisher
31	<i>Merops orientalis</i>	Small green bee- eater
32	<i>Microcarbo niger</i>	Little cormorant
33	<i>Vanellus indicus</i>	Red wattled lapwing
34	<i>Actitis hypoleucos</i>	Common sandpiper
35	<i>Bubulcus ibis</i>	Cattle egret
36	<i>Ardeola grayii</i>	Indian pond heron
37	<i>Threskiornis melanocephalus</i>	Oriental white ibis
38	<i>Columba livia</i>	Indian rock pigeon
39	<i>Spilopelia chinensis</i>	Spotted dove
40	<i>Centropus (Sinensis) parroti</i>	Southern coucal
41	<i>Eudynamys scolopaceus</i>	Asian Koel
42	<i>Megalaima viridis</i>	White cheeked barbet
43	<i>Galloperdix spadicea</i>	Red spurfowl
44	<i>Vanellus malabaricus</i>	Yellow wattled lapwing
45	<i>Chrysocolaptes guttacristatus</i>	Greater flameback woodpecker
46	<i>Pteropus giganteus</i>	Indian flying fox
47	<i>Paradoxurus hermaphroditus</i>	Toddy palm civet
48	<i>Funambulus palmarum</i>	Three striped palm squirrel
49	<i>Hystrix indica</i>	Indian porcupine
50	<i>Herpestes edwardsii</i>	Indian grey mongoose
51	<i>Canis aureus</i>	Indian golden jackal

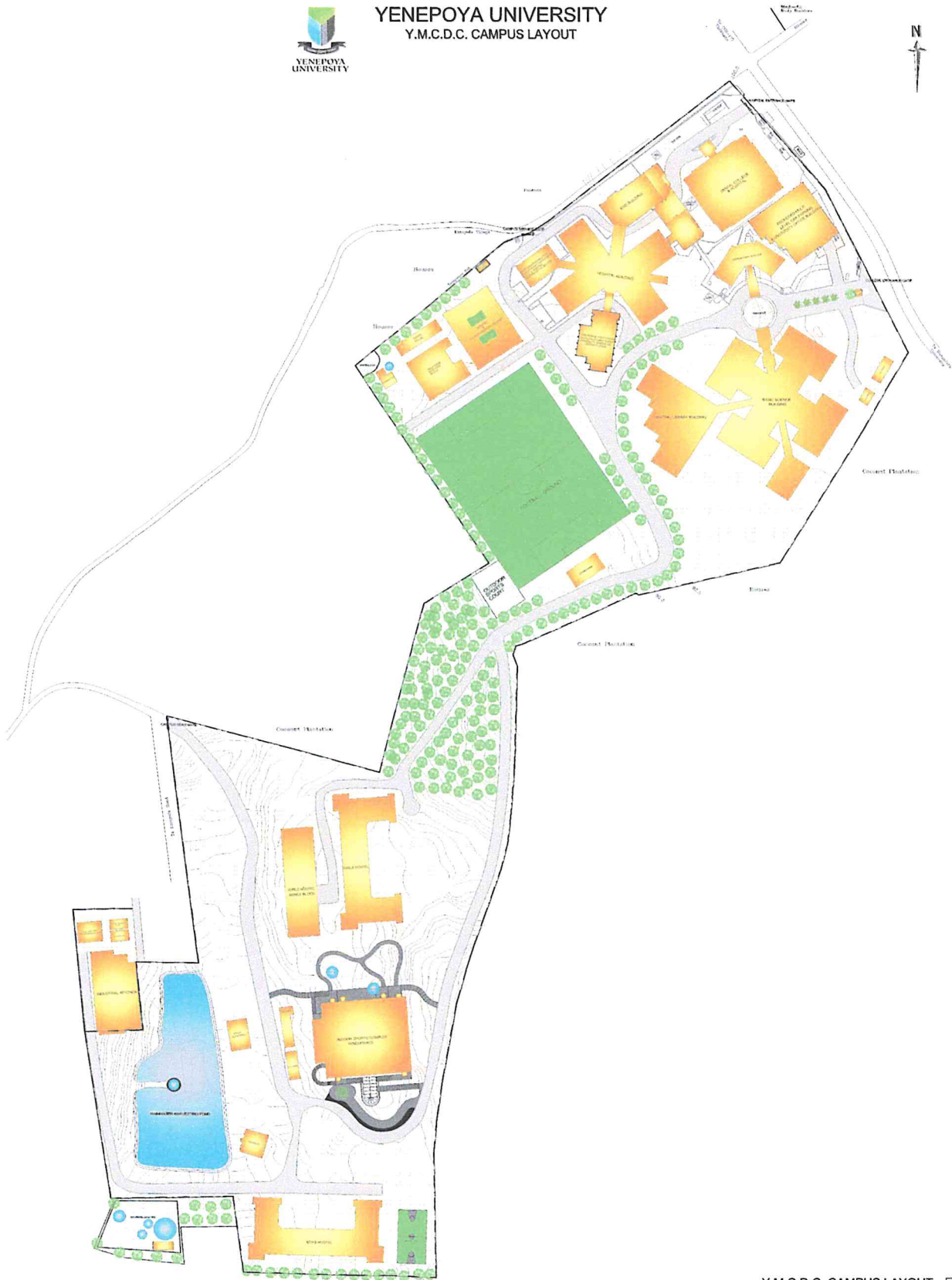


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