REPORT ON HYDROGEOLOGICAL INVESTIGATIONS ON WATER CONSERVATION METHODS IMPLEMENTED IN THE VIKRAMA SIMHAPURI UNIVERSITY AT KAKUTURU VILLAGE, VENKATACHALAM MANDAL, SPSR NELLORE DISTRICT.

Introduction: At the instance of the Registrar, Vikrama Simhapuri University requests the Deputy Director, Groundwater and Water Audit Department to inspect university for it is making necessary preparations for obtain NAAC assessment and accreditation through water conservation methods to sustain groundwater in the campus.

As per the instructions of the Deputy Director, Groundwater and Water Audit Department, Nellore detailed and integrated groundwater investigations were conducted in University campus at Kakuturu Village, Venkatachalam Mandal, SPSR Nellore district.

Location: The Investigated site is having an extent of 83.38 acres and is located at a distance of 1.5km south to the Kakuturu Village. Geographically the site is located in between North Latitudes of 14°21'35.65"N & 14°21'3.40"N and East longitudes 79°55'25.05"E & 79°55'14.94"E and falls in survey of India Toposheet No.57 N/15.

Physiography Drainage and Climate: The investigated area is having a plain topography and is gently sloping from north to south, with an elevation of 23m above mean seal level and sub-dendritic type of drainage pattern is prevailing around the investigated area. The investigated area experiences tropical climate conditions, the maximum and minimum temperatures in the district are 45°C and 18°C respectively. The area receives most of the precipitation during North-East Monsoon and the normal annual rainfall of the area is 1071.9 mm. The investigated area falls under the Command influence of local tank.

Soil Type and Cropping Pattern: The investigated area is covered with lateritic soils with a thickness varying from 2 to 3m, which possess moderate to good infiltration capacity. Paddy is the main crop that is being cultivated around the area by using surface water sources which are available in the form of local tank and groundwater is being used for domestic and industrial purposes only.

Geomorphology & Geology: Geomorphologically, the investigated area is a pediplain and underlained by Gneisses formation having medium grained texture.

Hydrogeology and Field Observations: The investigated area is covered with lateritic soils at the top and underlained by gneisses formation belonging to Archean age of geological time scale. The underlained formation is of semi consolidated to formation. The depth of weathered zone ranges between 15 to 20m followed by semi weathered zone of 20 to 35m thickness and fracture zones known to occur at 35 to 50m. In and around the scheme area the groundwater occurs under unconfined to semi confined conditions and is being utilized mostly by means of bore wells.

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During the inspection a total of 4 Tube wells, 2 Dugwells existing within the premises was inventoried. It is reported that the existing Tube well is constructed up to a depth of 60m.The Tube wells existing outside the premises are constructed up to a depth of 60m and is being used for domestic and irrigation purpose only. The present depth to water levels of these wells varies from 1.9 to 2.7m bgl, and the discharges of these wells vary from 6,500 to 7,000 lph with 3 to 5 HP submersible Motors.

During the field investigations it is found that the scheme area falls under the command area of Kakuturu Kaluva (Survepalli Branch canal) which is located adjacent to the scheme area along north side of the plant, and getting good recharge from it and no agriculture filter points were found.

Short duration yield test was conducted by time and volume method using a drum of 220 litres capacity to know the discharge of the Tube wells existing. This is constructed up to a depth of 60m and fitted with 5 HP Submersible Motor. The discharge measured range is 6,500 to 7,000 lph.

Water Level Data: The Ground Water and Water Audit Department is monitoring ground water levels through 1 Piezometer were established at M.P.D.Office, Venkatachalam Village and mandal. The maximum water levels of Venkatachalam Piezometer for last 8 years in pre and post monsoon seasons recorded as 6.75 and 3.86 m.bgl. The water level data of the Piezometer is presented here under in the form of table-I.

Table:I Depth to Water Level Data of Venkatachalam Piezometer

Water year	Venkatachalam	
	Pre monsoon(m)	Post monsoon(m)
2014-15	5.9	3.3
2015-16	5.8	0.91
2016-17	6.2	2.61
2017-18	6.45	1.7
2018-19	6.75	3.32
2019-20	6.73	3.86
2020-21	5.22	2.4
2021-22	4.31	2.34

Water year wise rainfall data, rainfall deviation and average pre monsoon and post monsoon water level data of Venkatachalam Piezometer is presented in Table-II. A hydrograph is prepared to study long term water level trend of the area and presented in Figure-1. From the hydrograph, it is evident that water levels are in fallen trend position

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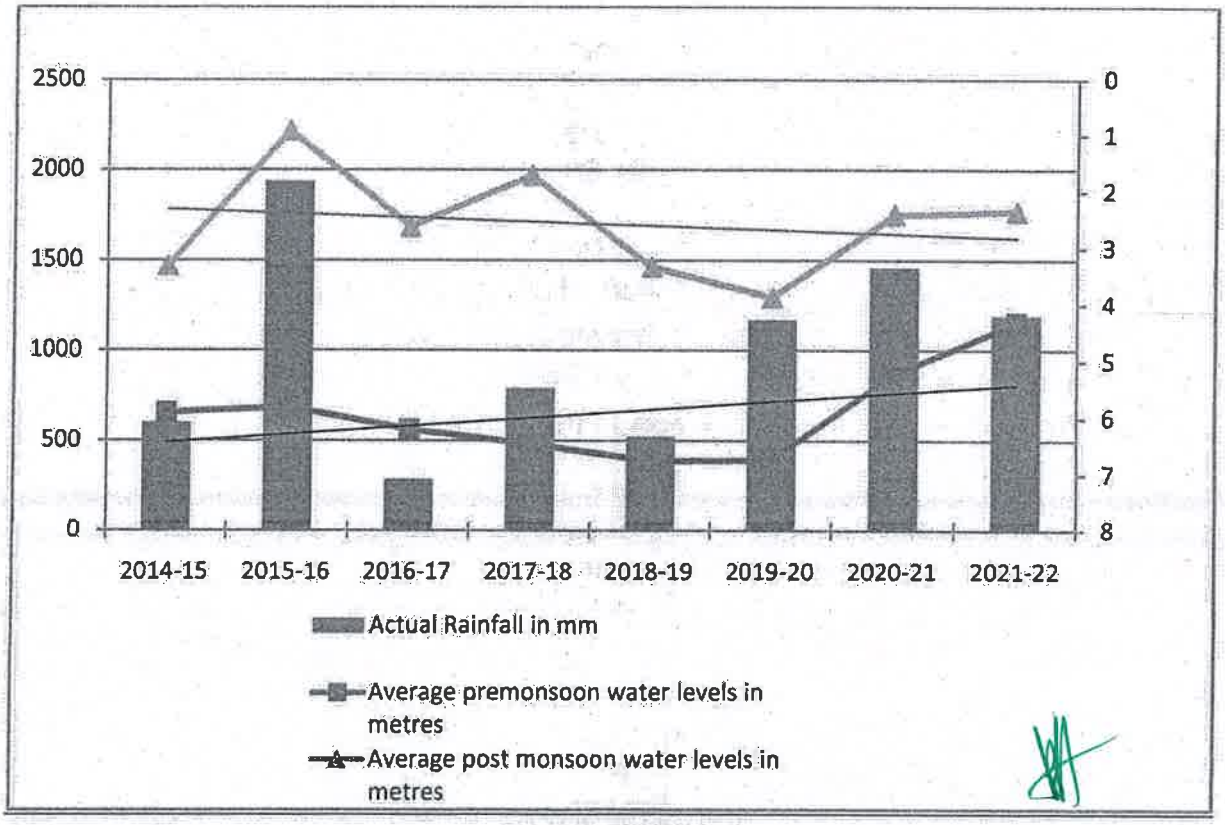
in spite of due to deficient rainfall in the water years from 2016-2019 and last three years it shows raising trend due to good and excess rainfall in the water years 2019-22.

Table:II WATER YEAR WISE RAINFALL DATA, RAINFALL DEVITION AND AVERAGE PRE MONSOON WATER LEVEL DATA OF PIEZOMETER NEARER TO THE PLANT (2014-15 to 2021-22)

Water year	Normal Rainfall in mm	Actual Rainfall in mm	Rainfall Deviation (%)	Average premonsoon water levels in metres	Average post monsoon water levels in metres
2014-15	1071.9	600	-44.0	5.90	3.3
2015-16	1071.9	1932.4	80.3	5.80	0.91
2016-17	1071.9	287.2	-73.2	6.20	2.61
2017-18	1071.9	789.3	-26.4	6.45	1.7
2018-19	1071.9	524.3	-51.1	6.75	3.32
2019-20	1071.9	1166.9	8.9	6.73	3.86
2020-21	1071.9	1456.2	35.9	5.22	2.4
2021-22	1071.9	1189	10.9	4.31	2.34

FIGURE-1: AVERAGE PRE-MONSOON & POST-MONSOON WATER LEVEL TREND OF PIZOMETRERS NEARER TO VIKRAMA SIMHAPURI UNIVERSITY AT KAKUTURU VILLAGE, VENKATACHALAM MANDAL (MAY2014-MAY-2022)



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GROUNDWATER ESTIMATION COMMITTEE (GEC) Status: The Kakuturu Village of Venkatachalam Mandal falls in the basin NLR_C_73_KASUMURU-MB. As per GEC 2019-20 calculations the availability, draft and stage of development are as shown in below Table-III.

S. No	Groundwater Assessment Unit	Net Groundwater Availability in Ha.m	Draft for all Uses in Ha.m	Balance in Ha.m	Stage of Development	Categorization of the Assessment Unit
1	Kakuturu Village	332	21	311	6%	Safe
2	Venkatachalam Mandal	11620	372	11248	5%	Safe
3	NLR_C_73_KASUMURU-MB Basin	12967	1613	11.354	14%	Safe

As per the GEC 2019-20 calculations the Kakuturu Village, Venkatachalam Mandal and the Basin NLR_C_73_KASUMURU-MB falls in safe category.

Suggestion for Groundwater Recharge: - As per the reported roof top, pavement and green belt areas available in the firm premises, a total of 2,23,391 Cu.m of rain water can be harvested in response to the normal annual rainfall of 1072mm in university campus. Details of calculation of quantum of runoff availability in the premises are given in table -IV below.

S. No	Location	Area in Sq.m (Approx)	Rainfall in mm	Runoff Coefficient	Quantity of available runoff in Cu.m
1	Buildings/Sheds (Proposed)	26882	1072	0.85	24.495
2	Paved Area	2,80,367	1072	0.65	1,95,359
4	Others	16,500	1072	0.20	3537
	Total Rainwater that can be Harvested				2,23,391

Therefore to compensate the groundwater losses and enhance the groundwater recharge, 2 recharge pits/shafts dimensions already builted in campus and constructed Farm ponds, roof top harvesting pits, water basins at the base of trees etc and recommending 2 more recharge pits/shafts with 180*57*3m and 132* 62*3m dimensions at suitable places in the campus.

S. No	Type of Structure Recommended	Dimensions of Recommended Structure (L*W*D)	No. of Structures recommended	No. of Fillings	Total Storage	Contribution to groundwater recharge (50% of Storage)
1	Recharge Pits	180*60*5	1	4	2,16,000 cu.m	1,08,000 cu.m
2	Recharge Pits	180*60*5	1	4	2,16,000 cu.m	1,08,000 cu.m
	Total water that can be recharged from 2 pits					2,16,000 cu.m

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Suggestions:-

1. Avoid water over flow from OH tanks
2. Arrest water leakages from valve/pipeline/hoses
3. Replace RO membrane and reduce RO reject
4. Install Aerators and reduce water consumption
5. Provide flush tanks in all Toilets
6. Install Treatment plant/ Waste water recycling unit to reuse of grey water for gardening purpose
7. Construct more number of rain water harvesting systems near building areas or farm ponds to recharge ground water levels
8. Water in the large water tank available in front of the University premises can be used for plantation to avoid water scarcity during summer season. Further, use drip irrigation and sprinklers for watering plants.
9. The University shall install one piezometer at Suitable place in their premises and install digital water level recorders with telemetry system for daily water level monitoring.
10. The University shall be required to adopt the latest water efficient technologies so as to reduce the dependence on groundwater resources.

26/4/23

Deputy Director
Ground Water & Water Audit Dept
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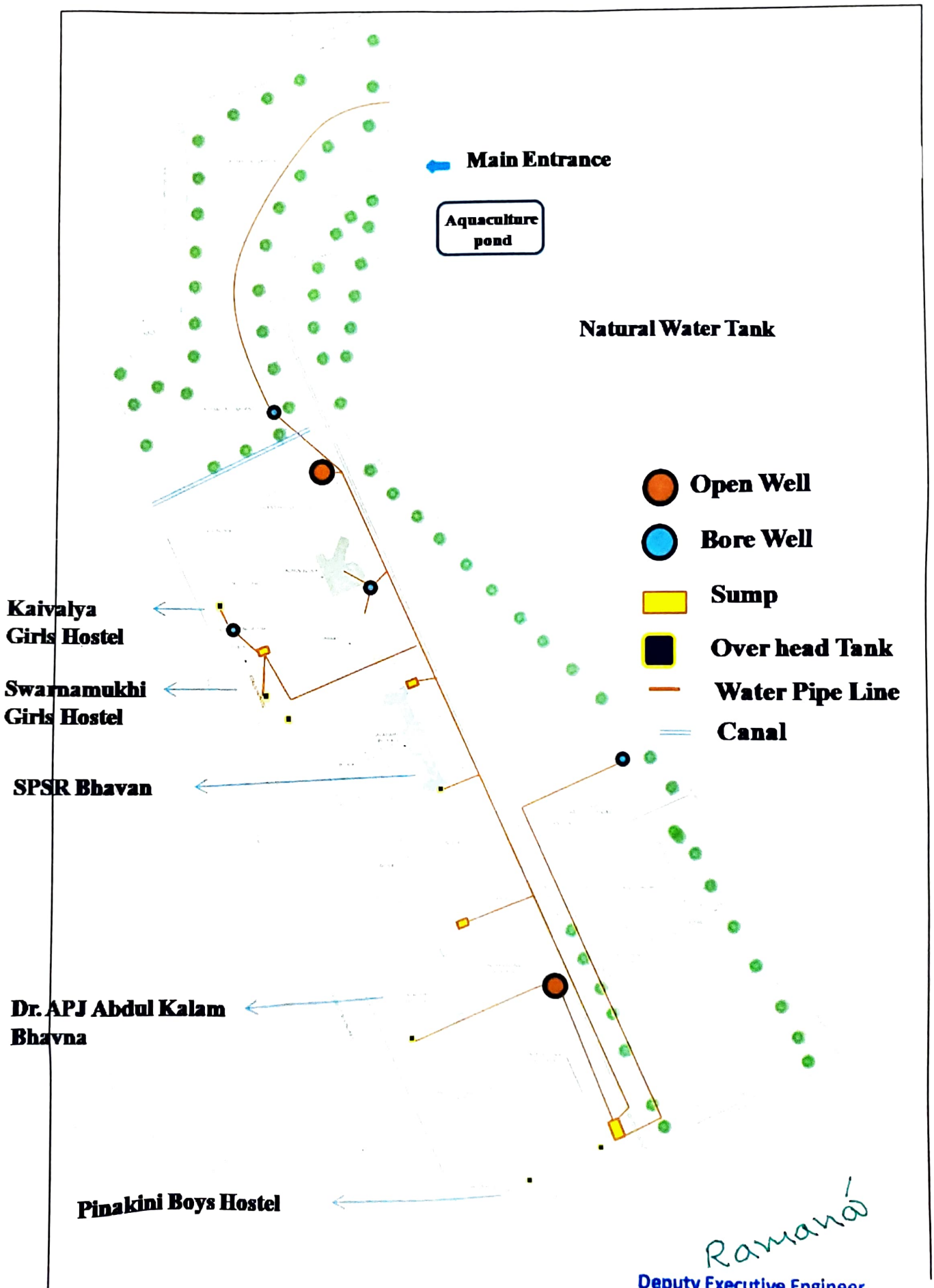
MAINTENANCE OF WATER BODIES AND DISTRIBUTION IN VSU CAMPUS



Ramana

Deputy Executive Engineer
Vikrama Simhapuri University
A.P.E.W.I.D.C:Nellore

RAMACHANDRA REDDY P

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VIKRAMA SIMHAPURI UNIVERSITY

[VSU, NELLORE & VSUPG CENTRE, KAVALI]

GREEN, ENERGY AND ENVIRONMENTAL AUDIT (2017-2021)

Prepared by

HYM INTERNATIONAL CERTIFICATIONS PVT.LTD
Hyderabad

VIKRAMA SIMHAPURI UNIVERSITY

Green, Energy, & Environmental Audit Report

(2017-2021)

Prepared by

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ACKNOWLEDGEMENT

We thank Vikrama Simhapuri University for allowing us to conduct **Green, Energy, & Environmental Audit Report** of the VSU, Nellore and VSUPG Centre, Kavali. Our special thanks to the following officials of the University for supporting us in preparing this report:

Chancellor	His Excellency Sri Biswabhusan Harichandan, Governor of Andhra Pradesh
Vice-Chancellor	Prof. G.M. Sundaravalli Honourable Vice-Chancellor
Registrar	Dr. L.V. Krishna Reddy
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VIKRAMA SIMHAPURI UNIVERSITY

Nellore, Andhra pradesh - 524 320, India

has been assessed and found to be in accordance with the requirements of the environmental standards

ISO 14001 : 2015

for the following scope of certification

IMPLEMENTATION OF GREENERY AND ENVIRONMENTAL PROMOTION ACTIVITIES

Further information about the scope of this certificate and applicability of ISO 14001 : 2015 requirements may be obtained by consulting the organization.

Issue Date : 29/10/2020

Renewal Date : 28/10/2023

1st Surveillance 28/10/2021

2nd Surveillance 28/10/2022

Authorised Signature

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has been assessed and found to be in accordance with the requirements of the Energy standards

ISO 50001 : 2018

for the following scope of certification

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Further information about the scope of this certificate and applicability of ISO 50001 : 2018 requirements may be obtained by consulting the organization.

Issue Date : 29/10/2021

Renewal Date : 28/10/2024

1st Surveillance 28/10/2022

2nd Surveillance 28/10/2023

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CONTENTS

ABOUT THE UNIVERSITY

Vikrama Simhapuri University, Nellore, came into being, fulfilling the long-cherished dream of the people of Nellore district, re-christened Sri Potti Sri Ramulu Nellore district since 2008, by Act No. 29 of 2008 enacted by the Legislature of the State of Andhra Pradesh and published in the Andhra Pradesh Gazette on 24thSeptember 2008. Erstwhile Chief Minister of Andhra Pradesh Dr Rajesekhar Reddy has laid stone for construction of university buildings at 83.33 acres allotted site on the National Highway No 5. The University is located just 10 KMS from the main town of Nellore. Meanwhile the University Grants Commission conferred recognition on the degrees awarded by Vikrama Simhapuri University under Section 22 of the UGC Act vide its communication No.F.9.2/2010 (CPP-I/PU) dt.20 January 2010. Subsequently, the university is also sanctioned 2(f) and 12 (b) Status by University Grants Commission. The University has 02 Constituent colleges – Vikrama Simhapuri University College, Nellore and Vikrama Simhapuri University College, Kavali. Vikrama Simhapuri University is thus situated in an ambience of great cultural awakening, fascinating journeys of the mind, and rapid economic development.

Biodiversity, the variety of life on Earth, is quite possibly the most amazing thing on the planet. It is the key to sustaining health, wealth, food, fuel and all of the vital services we depend on. Vikrama Simhapuri University has initiated 'Green, energy and Environmental Audit' of their institution campuses. In present survey, focus has been given on assessment of present status of diversity in the form of plants, insects and birds from the University main campus, Nellore & PG Centre, Kavali and efforts made by the University authorities for nature conservation. The review is the first stage in the development of a Green Action Plan for the university will contribute towards the implementation of "The strategy for the conservation and enhancement of biodiversity and Green initiatives". We thank University Officials for giving us the opportunity of preparing Green, Energy & Environmental Audit. We also thank Internal Quality Assurance Cell Team for supporting us. Our special thanks to Dr. A. Madhusudhana Reddy, Associate Professor, Department of Botany, Yogi Vemana University, Kadapa for supporting us for survey and identification of plant species in VSU campus. The team of "Green Energy and Environmental Audit" has been instrumental in the entire process of developing such a huge green space with high biodiversity and helping us with the data required for this report.

EXECUTIVE SUMMARY

There is a major concern towards the environmental degradation due to the rapid industrialization, anthropogenic activities at local, regional and global levels. This leads to a global environmental deterioration. Therefore, for sustainable future and to support natural resources, steps towards the stabilization of human population, adoption of environmentally sound and sustainable technologies, reforestation and ecological restoration are believed to be of paramount importance. To accomplish this task, academic institutions must initiate and support mobilization of internal and external resources and knowledge to meet the needs of environmental challenges. As an academic institution, Vikrama Simhapuri University (VSU) initiated some green initiatives to address fundamental problems associated with the environment deterioration. Further, we believe that as humans it is of profound responsibility to protect the earth's resources in perpetuity. Being one of the premier institutions of Higher Educational Institutes, VSU is aware of its responsibilities towards environmental issues and sustain environmental campaign through extension of activities in terms of education, research, policy formation and information.

This report is based on the approaches and interventions done on part of the University to address the green, energy and environmental concerns of the VSU campus. The current green, energy and environmental audit reflect our sustainable efforts on the campus. The audit was conducted by a team of faculty and students with support from various stake holders of VSU. Further, the VSU Clean and Green Committee and the VSU-NSS teams indeed the reflection of VSU endeavour to exercise leadership in promoting environmental sustainability and inculcate the habit of green initiatives among all students and each of us. This commitment of VSU has lead to actions whose reflection is visible remarkably on ground.

This initiative i.e. green, energy and environmental audit is significant for the institution, and also pave a way for other institutions to emulate and adopt as an audit model and thus, occupy a strategic position in the endeavours of sustainable environment for all.

GREEN, ENERGY AND ENVIRONMENTAL AUDIT

Green, Energy and Environmental Audit are a process of systematic identification, quantification, recording, reporting and analysis of components of environmental diversity of college. This 'Green, Energy and Environmental Audit' aims to analyze the green initiatives at VSU, Nellore and VSU PG Centre, Kavali, which will have an impact on the environment. Several, Green, Energy and Environmental Audit focuses on the utilization of renewable and non-renewable sources, rain water harvesting, Green Campus, Solid waste management, Water Management, & Energy Management etc. being implemented by the University Management.

Green, Energy and Environmental Audit are a valuable means for a University to determine the key element such as utilization of energy, water and plantation aspects. Further, the audit of energy and green or environment represents health consciousness and promotes environmental awareness, values and ethics. It is also one of the means to understand the Green impact on campus. As environmental sustainability is becoming an increasingly important issue for the nation, the role of higher educational institutions in relation to environmental sustainability is more prevalent. Hence, it is imperative that the University evaluate its own contributions towards a sustainable future.

ABOUT GREEN, ENERGY AND ENVRONMENTAL AUDIT

Assessment of environmental performance is a measure of Green auditing (Welford, 2002). Green space and well-being are positively correlated. It can be accomplished through the systematic way by considering the points like documentation, periodic assessment, and objective review by regulated entities of facility operations and practices to meet the standards of environmental requirements (EPA, 2003). The university campuses offer an integral environment for learning. Through improved air, water quality, buffering of noise pollution and mitigation of impacts from extreme events, green spaces can reduce environmental health risks associated with lifestyle. In general, it is the systematic examination of the interactions between any operation and its surroundings. Many aspects need to be considered to assess the green audit such as all emissions to air, land and water; legal constraints; the effects on the neighbouring community; landscape and ecology and the public's perception of the operating company in the local area. Further, the environmental components decide what kind of plants and animals are to be sustaining in the specific area. The V.S. University, Nellore & VSU PG Centre, Kavali have clay loamy soil. During

summer season, water scarcity in the region is an adverse factor. But still the efforts of university for the plantation and development of green spaces at both the Nellore and Kavali campuses are commendable. The main green spaces in the campus are medicinal plants garden, social forestry and other lawns which are properly grown conserving biodiversity. Even the construction of the buildings is well planned with plants in the middle of the building allowing enough air and light flow. Overall the distribution of species principally depends on the climatic conditions and presence of specific ecological parameters along with typical land-form and land-type. In the distribution of flora, the topography, rainfall, soil type etc. play crucial role for their distribution.

OBJECTIVES OF THE GREEN, ENERGY AND ENVIRONMENTAL AUDIT

1) To assess the green, energy and environmental audit in a systematic way
2) To evaluate the evidences for green energy and environmental audit by the auditor
3) To evaluate the auditor concerns assertions about economic actions and events
4) To ascertain the degree of correspondence between auditor assertions and established criteria.
5) To provide the results ascertained by the auditor to interested users

PROCEDURE FOLLOWED

Vikrama Simhapuri University, Nellore and VSU PG centre Kavali were constructed with least distortion to the original topography of the site. The buildings are two storied with enough ventilation and sunlight. The area details of the university main campus and VSU PG Centre are as follows.

Area	VSU Main Campus, Nellore	VSUPG Centre, Kavali
Area of Land (acres)	**83.3**	**79.8**
Area of Permanent Buildings	**7270 m^2**	**3755.8 m^2**
Area of Administration Block	**4331 m^2**	**1217.4 m^2**
Area of Academic Blocks along with Labs	**9856.78 m^2**	
Area of Library	**1426.43 m^2**	**367.9 m^2**
Area of Hostel Buildings	**3656.91 m^2**	**2044.38 m^2**

SATELLITE IMMAGE OF VSU, NELLORE CAMPUS

AERIAL VIEW OF VSU, NELLORE CAMPUS

SATELLITE IMMAGE OF VSU PG CENTER, KAVALI CAMPUS

AERIAL VIEW OF VSU PG CENTER, KAVALI CAMPUS

GREEN AUDIT FINDINGS

For Green Audit following major areas (including their sub-sections) were covered and compliance/ initiatives under these areas were verified/ validated.

a) Design of buildings with proper Daylight and Ventilation:

b) Water Efficiency & management

c) Wastewater Management

d) Indoor Air Quality

e) Energy Management and efficiency

f) Solid Waste Management

g) Transportation

h) Green Belt

i) Green Programs (Green initiatives)

a. Design of buildings with proper Daylight and Ventilation :

1. All Classrooms, Laboratories, Administrative offices, library, Seminar halls etc. have high ceiling, wide doors and large windows with proper ventilation.

2. Buildings are designed in such a way that corridors and classrooms receive ample sunlight. Curtains are provided for laboratory windows to avoid glare. Natural light in the classrooms was about 70-85 lux.

3. Ventilation in classrooms and laboratories is facilitated by windows and exhaust fans.

4. Cross ventilation is facilitated due to large windows on both sides of all classrooms, labs and administrative sections. Air conditioners are used in offices, seminar halls, research and computer laboratories and computer server rooms etc.

5. Exhaust fans are provided in washrooms, kitchens and sciences department laboratories.

b) Water Efficiency & Management

1. Major water source for university main campus is two big irrigation/open wells along with 4 bore wells, university post graduate centre has two bore wells and open well in the campus which is currently not used for water withdrawal.

2. One open well situated adjacent to herbal garden fitted with 7HP motor to lift and transfer water to SPSR Bhavan and Pinakini Boys Hostel. Second open well locaed close to APJ Abdul Kalam block fitted with 3.5HP motor is used for supporting water requirement of APJ Abdul Kalam Bhavan.

3. One bore well located in the boys hostel premises fitted with 5HP motor supports water requirement of Gents hostel and College Building. Second bore well present in ladies hostel fitted with 1HP motor supports water requirement of ladies hostel.

4. One bore well located in the women's hostel premises fitted with 2HP motor meets the water requirement of Swarnamukhi and Kaivalya Women's hostels. Rest 3 bore wells are used for watering plants.

5. The university main campus is situated very near to the Kakutur village tank with the water spread area of 120 acres. Tank water is used for filling the water in the aquaculture pond facility connected with the university campus area.

6. The daily water consumption for the entire campus when in full operation is 51 KL, which includes 25 KL consumption in academic area and 26 KL for gardening and administrative areas. Water collected in rainwater harvesting pits is used for gardening.

7. As per IS 1172 standards for non-residential institutions, water consumption should be maximum 45 L/person/day. Water consumption of the College works out to be 6.3 L/person/day, which is well under limit.

8. Water is pumped directly into overhead tanks of each building and then distributed to washrooms, basins, kitchens, laboratories and water purifiers/ coolers installed in the College building.

9. Rain Water Harvesting (RWH) system, comprised of rooftop and surface runoff, is provided in the campus. Through RWH, rain water collected is used for recharging ground water. Rain water collected is also stored in recharge pits which are used for gardening. Installation of rooftop RWH system is also planned for under-construction building.

10. 4 water coolers fitted with RO purifiers are provided in College building as a source of safe drinking water. Third party contractor is appointed by the

University their Maintenance and cleaning of the entire campuses of both main campus and PG centre.

11. Hostels, Restrooms, Laboratories of Chemistry, Marine biology, Zoology, Biotechnology and canteen are water intensive areas. Water conservation faucets (non□concussive taps, aerator taps) are fitted in some washrooms. Dual flushing systems are not provided in the washrooms.

12. Dry and wet mopping is practiced for floor cleaning. Floors are mopped once a day. University has appointed third-party contractor, Sulabh Enterprises for cleaning activities in both the campuses.

13. As informed by university electrical & water management team, tap water leakage is immediately attended to by the maintenance department for reducing the water wastage.

14. Drip irrigation system is established for watering/ irrigation of plants which leads to water conservation.

15. Signage boards on water conservation were displayed in washrooms, hostels, canteen, laboratories and on water purifiers.

Water quality of source water in the both campus areas is tested and results are given below table

S. No	Parameter	University Main Campus	University PG Centre
Physical Parameters			
1	Turbidity	1.5 NTU	1.2 NTU
2	TDS	196 ppm	210 ppm
Chemical Parameters			
3	pH	7.3	7.1
4	Total Hardness	132 mg/L	210 mg/L
5	Calcium (Ca)	55 mg/L	49 mg/L
6	Magnesium (Mg)	38 mg/L	29 mg/L
7	Total Alkalinity	86.5 mg/L	97.2 mg/L
6	Chloride	62 .5 mg/L	59.8 mg/L
7	Nitrate	0.7 mg/L	0.9 mg/L

10	Sulphate	46.5 mg/L	55.7 mg/L
Elemental Analysis			
11	Iron (Fe)	<0.05 mg/L	<0.05 mg/L
12	Arsenic (As)	<0.01 mg/L	<0.01 mg/L
13	Lead (Pb)	<0.01 mg/L	<0.01 mg/L
14	Zinc (Zn)	<0.05 mg/L	<0.05 mg/L
15	Chromium (Cr)	<0.05 mg/L	<0.05 mg/L

Open wells in the university campus

Bore wells in VSU. Nellore Campus

Large water tank near to University Main campus, Nellore

RO plant at VSU, Nellore campus

Bore wells at VSU PG center, Kavali Campus

At Ladies Hostel

at Gents Hostel

EUREKHA FORBES Aquaguard RO plant at VSU PG Center, Kavali

d) Indoor Air Quality

Indoor Air Quality (IAQ) refers to the air quality within & around buildings and structures, it relates to the health and comfort of building occupants. Common indoor pollutants are listed as below:

1. Carbon monoxide – Sources of carbon monoxide are incomplete combustion of fossil fuels.
2. Volatile organic compounds (VOCs) – VOCs are emitted by paints and lacquers, paint strippers, pesticides, office equipment such as copiers and printers, correction fluids and carbonless copy paper, graphics and craft materials including glues and adhesives, permanent markers, and photographic solutions etc.
3. Carbon dioxide – Due to human respiration, burning of dry waste materials etc.
4. Particulate matter – Due to construction and maintenance activities, vehicular pollution.
5. Nitrogen Oxides- Due to vehicular pollution.

- Science laboratories and kitchens in hostels and canteen use liquefied petroleum gas (LPG), a clean fuel.
- In classrooms and laboratories, the mode of ventilation is natural draft (through windows) and is enhanced by fans. Large windows and cross-ventilation are observed in corridors. Air conditioners are used in some offices and computer laboratories. ACs are serviced regularly to ensure indoor air quality.
- Wash rooms and science laboratories are provided with exhaust fans so that the fumes are safely discharged outside the building.
- Green belts have been set up in the both the main campus of university & PG Centre Kavali campus area.

Details of CO2 and CO emitters: Based on our calculation, the different sources of Carbon dioxide (CO_2) and Carbon monoxide (CO) emitters in our college are:

S.No	Item	VSU main Campus	VSUPGC, Kavali
1	Vehicles(Two/Four Wheelers & heavy)	65	38
2	Refrigerators & Deep freezes	21	10

3	Air conditions	29	18
4	Burning Pits	2	01
5	Water Coolers & RO Systems	10	02
6	Ice makers	02	-

On the days of data collection, there were 15 cars, 27 bikes and 20 scooters in the university main campus and 8 cars, 21 bikes and 9, in addition to the vehicles for pick up and drop of visitors and to deliver commodities to the canteen, which in turn proves that these vehicles may contribute moderate to high carbon emission. There are 21 refrigerators along with deep freezers, 29 air conditioners and 10 working water coolers in main campus. The students, teaching and non-teaching staff and the visitors also contribute to carbon dioxide emission. There is a burning pit near the canteen where all the wastes collected from the class rooms and labs which were not suitable for recycling are burnt. Plastic wastes with food particles from the canteen are handed over to the Grama Panchayat, Kakutur for further disposal.

e. Energy Management and Efficiency:

i. Electricity:

1. Common electricity meter is provided for the entire campus. Electricity is provided by Andhra Pradesh State Power Distribution Corporation Limited (APSPDCL). Electricity bills from 2017-22 were available for review (average consumption 15498 units/ month). Latest bills were available for review.

   The areas of major consumption of electricity are mentioned below:

Major Electrical Items used in campus	**VS University Main Campus, Nellore**	**VS University PG Centre, Kavali**
Lights & Tube lights	**92**	**46**
LED Bulbs	**147**	**115**
Solar Lights	**15**	**10**
Fans (ceiling fans & wall fans)	**247**	**98**
Refrigerators & Deep Freezers	**21**	**10**
Air Conditioners	**29**	**18**
Computers (desktops & laptops)	**275**	**130**
Printers & Scanners & Xerox Machines	**47**	**20**
Projectors	**10**	**06**
Smart Boards	**10**	**02**
Motor Pumps	**09**	**02**
Water Coolers	**08**	**03**
Water purifiers (RO Systems)	**02**	**01**
Major Laboratory Equipments	**58**	**22**

2. Conventional tube lights, LEDs & fans are installed in classrooms, laboratories, seminar halls and library. For efficient energy consumption and saving on electric bill, university has initiated the process of replacing incandescent bulbs and tube lights with LEDs.

3. University main campus and PG Centre have 31 air conditioners with two/ three/five -star ratings (6 five Star, 11 three star and 14 two star) [Standards set by Bureau of Energy Efficiency (BEE)].

4. An Uninterruptible Power Supply (UPS) system is provided in computer laboratories for computers and servers rooms. The UPS system is typically used to protect hardware viz. computers, data centres, library, internet and telecommunication equipment or other electrical equipment when an unexpected power disruption could cause serious work disruption or data loss.

5. Reflectors are not provided for lights in the library, seminar halls and auditorium. Reflectors can reduce the number of lights required and hence electricity consumption.

6. All computers have LED screens; computers are shut down by turning off the main switch when not in use.

7. Common switches are provided for some tube-lights & fans. To avoid wastage of energy due to common area illumination, it is recommended to have separate switches.

8. Tube-lights and fans are switched off by students and staff when not in use. Instructions regarding switching off the electrical appliance were seen in laboratory notice boards. However, signages are not provided near electrical switch boards. Signage can encourage & help users to switch off lights and fans to save electricity.

ii. On-Site Energy Generation (Usage of LPG/ Natural Gas & Solar Energy):

1. LPG cylinders are used mainly in canteen, hostels kitchens for cooking and in chemistry, botany, zoology, microbiology, marine biology and biotechnology laboratories. Inventory of cylinders usage was not available for review. 1 cylinder of 14 kg generates 649.5 MJ (Mega Joules) of energy. An average of 6 cylinders/week at Hostel and an average of six cylinders per two months at departments.

2. Storage facility for LPG cylinder is located on ground floor. All the commercial LPG gas cylinders were in vertical position with access control; however it is necessary to provide extra support system like chain in order to prevent cylinders from falling, movement or physical damage.

3. University main Campus has a diesel generator (DG) of capacity 125 KVA. DG set is used only in case of emergency when there is power cut-off. DG emissions are not monitored.

4. The university main campus approach roads have solar panel LED street lights for saving on electric bill.

5. Steps towards the installation of On grid Rooftop Solar System of 100 KWH capacity has been initiated at VSU with the support of SEMCORB Energy Pvt. Ltd under CSR scheme.

HT/LT Transformer

125 KV Generator

Solar panel LED lights in the common areas and roads in the campus

c) Wastewater Management

1. Wastewater is mainly generated from washing, toilet flushing, kitchens in hostels, canteen kitchen and laboratories. Sufficient washrooms are provided in the university main and PG centre campus admin, academic buildings and hostels.
2. Currently, sanitary wastewater generated is sent to municipal sewer line in both the campuses. Sewage treatment plant (STP) of 200 KLD capacity is under planning to construction for the treatment of sanitary wastewater generated in the campus. STP will comprise of primary and secondary treatment (biological treatment) followed by filtration.
3. Waste water generated from the RO systems and water coolers in the drinking water areas connected to near garden/plantation area and kitchen garden maintained in the university campus.

Grey water from Pinakini Boys Hostel and girls are directed through a underground a drainage system into a large soak pit constructed at a faraway place from the hostel blocks

Underground drainage system for disposing waste water into soak pits

f) Solid Waste Management

Solid waste generated from campus includes mainly paper waste, wet (food/ organic) waste and E-waste.

- Blue and Green covered/ pedal-pushed dustbins are placed in the both main campus and PG centre premises. Waste bins are provided on each floor, in staff rooms, class rooms, laboratories, washrooms, kitchen, hostels & canteen and in campus areas.
- Daily around 50-75 kg organic/ bio-degradable waste is generated in the both campuses which includes vegetable, food waste, horticultural waste. Quantity of horticulture waste varies significantly due to seasonal variation, e.g. around 50-60 kg of horticulture waste is generated daily in February- March due to leaf fall.
- Recently, university main campus had vermin composting unit for the treatment for the treatment of horticulture waste generated in the campus. The unit will be operational in 3-4 months.
- Biodegradable wet waste is mostly generated from the hostels, kitchens, canteen. The university has initiated the process of installing a composting unit of 25-30 kg/ day capacity for the treatment of canteen waste and some horticulture waste. Composting unit will be operational once the classes start working.
- In other areas like classrooms and administrative sections, mostly paper waste and plastic wrappers are generated.
- Segregation of wet and dry waste is practised within the campus. However, there is no signage for promoting segregation of wet and dry waste.
- Paper Waste Management: Being an academic institution, waste paper is one of the main solid wastes generated in the premises. College has taken steps to minimise and avoid paper usage.
- Prints and photocopies are taken on both sides of the paper to avoid excess paper usage. Rather than photocopy, digitalisation (scanning) is practised.
- All the internal circulars communicating to teaching and non-teaching staff are through SMS, e-mails and whatsapp messages only.
- University Library has an e-book facility having e-journals, and e□books available online through different portals such as INFLIBNET, National Digital Library. Two computer room are provided in the library to access online services.
- University has a Learning Management System (LMS) where notices are sent, exam results are displayed in the website and attendance is recorded digitally.

- Paper recycled is used for laboratory work. Remaining paper waste is sent to local vendor for recycling. The dissertation reports, journals and answer papers are stored as per the University rules and it is sent to vendor as and when required.
- The college encourages students to use eco-friendly material and recycle old papers/ scrap for decoration purposes during department functions and festivals.
- **E- Waste Management:** E- waste is broadly comprised of discarded computer monitors, motherboards, Key boards, scanners and chargers, compact discs, headphones, Printed Circuit Boards , Xerox machines etc. E- waste is collected & stored in the campus and sent to authorised vendor for recycling/ disposal under buy-back policy.
- **Plastic Waste:** University main campus and PG centre strictly follows the guidelines regarding plastic usage and usage of single use plastic e.g. carry-bags, glasses, spoons etc. are strictly prohibited.
- As per the university guidelines, Canteen Contractor is prohibited to use plastic carry bags, plastic paper, instead paper plates and wooden spoons are used for packing and serving.

g) Transportation:

- The location of university main campus and PG centre is quite enviable with bus service and public transportation facility. Most of the staff pool cars and university buses few staff members travel by private vehicles.

- University has vehicle-free campus. Dedicated area is available for parking has been allotted near the admin and academic blocks; vehicle movement and parking in the main campus is restricted and prohibited.

- University encourages the students and staff to use the university bus facility or public transport system to reduce carbon emissions in the campus areas.

h) Green Belt:

Committee inspecting the campus for compilation of quality audits

University main campus has an herbal garden. University has nearly 20 acre green belt area, having 382 variety of plants including trees shrubs and potted plants. List of few plants present in the campus is given in Annexure 1 & 2. Plantation improves aesthetics and helps as a buffer in reducing noise level, maintaining temperature of the area. Herbal garden has different specific types of plants planted with respect to their medicinal importance.

HERBAL GARDEN

Biodiversity Conservation is very crucial and important for a campus because eventually these spaces become lung spaces of that location or district or state. In the year 2017, Vikrama Simhapuri University with the support of university has set up a herbal Garden in 2.0 acres of extent to promote the herbal medicines through research in this area. This garden is to serve as a national repository of living medicinal plant specimens of Eastern Ghats towards ex-situ conservation and propagation of endemic and threatened species. Further to maintain live plant collections for the purpose of research, educational, display and aesthetics. Moreover it would serve as Centre of Excellence for conservation, research and education.

The Vikrama Simhapuri University Herbal garden is at present, species collected from different parts of Andhra Pradesh and elsewhere are being maintained in the herbal garden and in green house. This garden is currently harbouring indigenous and exotic taxa including endemic and threatened herbal species and spread over 2.0 acres. Being part of an academic institution one of the main objectives of the herbal garden is to impart education through first-hand field experience and every plant introduced in the garden is properly labelled, with its scientific name and the family to which it belongs and this is essential for taxonomic knowledge.

Taxonomy is important for all other allied/natural sciences. Therefore, the University herbal garden strives to impart the taxonomic knowledge through its various display sections and educational programmes. The garden presently represents most of the families that occur in the Eastern Ghats. The important families represented are mentioned in the taxonomic layout.

All the plants in the herbal garden are properly labelled with botanical names, local name, family to which the particular plant belongs and known uses. The garden is home for good

number of birds and butterflies and many other insects. Snakes are found in the garden which is also a natural habitat for viper, cobra and other reptiles.

The herbal garden is not only to protect and nurture plants but also to provide inspiration for protecting plant diversity in the world of growing environmental challenges. The garden is now attracting people from all walks of life. The efforts of the garden management are towards development of a range of projects covering science, sustainability, propagation of indigenous fruit crops, seed bank and herbarium. The education programmes are aimed at building awareness for the urgent need to protect our biodiversity from threats of land use changes, climate change, invasive species, over exploitation and pollution. The plant collections serve the purpose of display, education, research, conservation and enjoyment. With the committed efforts of the university administration, members of faculty of department of botany in the PG centre Kavali and department of Biotechnology, VS University main campus, research scholars and students, the dream of developing an excellent botanical garden and herbal gardens for the purpose of research and education has been fulfilled.

Annexure- 1

MEDICINAL PLANTS

It is observed that wide variety of medicinal plant species are gathered and planted in the campus. Few of them are ex-situ species planted in botanic garden. Total medicinal plants contribute 10% of the total plants. The following are the details of species grown here:

S.NO.	SCIENTIFIC NAME	COMMON NAME
1.	*Phyllanthus niruri*	Nela usiri
2.	*Solanum nigrum*	Kamanchi
3.	*Hydrocotyle* spp.	Babbasa
4.	*Ocimum* sp.	Agni tulasi
5.	*Stachytarpheta jamaicensis*	Eduru uttareni
6.	*Aloe vera*	Kalabandha
7.	*Feronia limonia*	Velaga
8.	*Terminalia arjuna*	Tella maddi
9.	*Ocimum tenuiflorum* var. Krishna tulasi	Krishna tulasi
10.	*Ocimum tenuiflorum*	Tulasi
11.	*Alpinia galanga*	Dhumparastramu
12.	*Euphorbia tirucalli*	Konda jamedu
13.	*Datura metel*	Thella ummettha
14.	*Datura fastuosa*	Nalla ummettha
15.	*Indigofera tinctoria*	Neeli
16.	*Cymbopogon flexuosus*	Nimma gaddi
17.	*Plumeria rubra*	Vada ganneru
18.	*Boerhavia diffusa*	Atika mamidi
19.	*Catharanthus roseus*	Billa ganneru (pink)
20.	*Catharanthus alba*	Billa ganneru (white)
21.	*Saussurea obvallata*	Brahma kamalam
22.	*Syzygium cuminii*	Neredu

23.	*Clitoria ternatea*	Shanku pushpin (white)
24.	*Tylophora asthmatica*	Asthma theega
25.	*Crotalaria verrucosa*	Giligicha
26.	*Asparagus racemosus*	Sathavari
28.	*Plumbago zeylanica*	Chitramulam
29.	*Decalepis hamiltonii*	Barre sugandhapala
30.	*Sauropus androgynus*	Multivitamin mokka
31.	*Paederia scandens*	Grandha Prasarini
32.	*Bauhinia acuminata*	Deva kanchana
33.	*Ocimum basillicum*	Sabja
34.	*Cheilocostus speciosus*	Chengalvacostu
35.	*Pterocarpus santalinus*	Red Sandal
36.	*Eclipta prostrata*	Guntagalagara
37.	*Achyranthes aspera*	Utthareni
38.	*Bryophyllum pinnatum*	Ranapala
39.	*Calotropis procera*	Jilledu
40.	*Azadirachta indica*	Neem
41.	*Clitoria ternatea*	Shanku pushpin (violet)
42.	*Tinospora cordifolia*	Thippa theega
43.	*Phyllanthus emblica*	Usirikaya
44.	*Rauvolfia tetraphylla*	Papataaku
45.	*Mirabilis jalapa*	Chandrakanta
46.	*Hemidesmus indicus*	Sugandhipala
47.	*Gloriosa superba*	Adavi naabhi
48.	*Morinda citrifolia*	Noni
49.	*Cissus quadrangularis*	Nalleru
50.	*Centella asiatica*	Saraswati Aaku
51.	*Holarrhena antidysenterica*	Kodisapala
52.	*Cheilocostus speciosus*	Chengalvacostu (white)

53.	*Aerva lanata*	Kondapindi
54.	*Mimosa pudica*	Atthi patthi
55.	*Saraca asoca*	Ashoka
56.	*Justicia gendarussa*	Sri gandham / chandanam
57.	*PouZolZia Zeylanica*	Bandi gurivinda
58.	*Curcuma aromtica*	Kasthuri pasupu
59.	*Bacopa monnieri*	Brahmi
60.	*Acorus calamus*	Vasa
61.	*Artemisia vulgaris*	Machapathri
62.	*Gymnema sylvestre*	Podapathri
63.	*Curculigo orchioides*	Nela thaadi
64.	*Psoralea corylifolia*	Bavanchalu
65.	*Andrographis paniculata*	Nela vemu
66.	*Abelmoschus moschatus*	Kasthuri benda
67.	*Aristolochia indica*	Nalla eswari
68.	*Chrysopogon ZiZanoides*	Vattiveru
69.	*Cymbopogon martinii*	Palmarosa
70.	*Curcuma pseudomontana*	Nalla pasupu

FLORAL BIODIVERSITY

Wide range of varieties are found in the campus. It observed that high number of Trees i.e., 30% and herbs i.e., 27% are found here. 11% shurbs, 9% grasses & cycads and 7% of medicinal Plants are seen. Though other species are in less number, this counts to high biodiversity of the campus.

Plant type	No. of varieties	No. of species found
Aquatic Plants	3	400
Creepers	4	1010
Climbers	24	4950
Medicinal Plants	29	9350
Flowering Plants	9	8950
Fruiting Plants	9	6500
Grasses & Cycads	38	18750
Herbs	115	52990
Palms	10	6400
Shrubs	45	19450
Trees	127	164290
Vines	2	150
Weeds	9	3700
	424	**296890**

PLANT HEIGHT:

Based on height the highest number of plants with 50 to 100 cms are 50.2% and more than 12 meters are 30%.Further very less height plants are 8 to 12 meters 0.7%. The following are the details:

Height	No. of species
Less than 50 cms	30
50 to 100 cms	213
Climbers	24
2 to 4 meters	5
4 to 6 meters	7
6 to 8 meters	5
8 to 12 meters	3
More than 12 meters	137
	424

Water Tolerance

It is observed that the water scarity considered during the plantation. 58% are normal water intake plants and 42% plants can tolerate less water also.

Water Tolerance	No. of species
Can tolerate less water	176
Normal	248

Estimated lifespan

Most of the plants i.e., 40% are very long life span plants, 1% plants lifespan is 1 to 2 years and 33% plants lifespan is 6 to 12 months. Hence the plants are also well planned as per the lifespan.

Lifespan	No. of species
Less than 6 months	91
6 – 12 months	138
1 – 2 years	21
More than 2 years	5
Very long life	169

FAUNAL BIODIVERSITY

Due to the high plantation wide variety of faunal species are found within the campus. Especially high number i.e., 43% varieties of butterflies are found. Similarly 17% varieties fo insects are found here. The following are the details:

SNo	Species	No. of varieties
1	Amphibians	6
2	Arthropods	9
3	Aves (Birds)	12
4	Insects	15
5	Butterflies	17
6	Reptiles	14
7	Mammals	8

LIST OF FLORAL SPECIES:

As per the findings of internal green audit conducted by the university, large trees include in the Annexure-2

Annexure- 2

S. NO	NAME OF THE SPECIES	HABIT
	ACANTHACEAE	
1.	*Asystasia gangetica* (L.) T. Anderson	Herb
2.	*Andrographis paniculata* (Burm.f.) Wall.	Herb
3.	*Blepharis repens* (Vahl) Roth.	Herb
4.	*Indoneesiella echioides* (L.) Sreemadh.	Herb
5.	*Lepidagathis cristata* Willd.	Herb
6.	*Rostellularia prostrata* R.B. Majumdar	Herb
7.	*Ruellia tuberosa* L.	Herb
	AIZOACEAE	
8.	*Trianthema portulacastrum* L.	Herb
	AMARANTHACEAE	
9.	*Achyranthes aspera* L.	Herb
10.	*Allmania nodiflora* (L.) R. Br.	Herb
11.	*Alternanthera sessilis* (L.) DC.	Herb
12.	*Amaranthus spinosus* L.	Herb
13.	*Amaranthus tricolor* L.	Herb
14.	*Amaranthus viridis* L.	Herb
15.	*Celosia argentea* L.	Herb
16.	*Digera muricata* (L.) Mart.	Herb
17.	*Gomphrena globosa* L.	Herb
18.	*Gomphrena serrata* L.	Herb
19.	*Pupalia lappacea* (L.) Juss.	Herb
20.	*Trichurus monsoniae* (L.f.) C. Towns	Herb
	AMARYLLIDACEAE	
21.	*Crinum asiaticum* L.	Herb
22.	*Zephyranthes rosea* Lindl.	Herb
	ANACARDIACEAE	

23.	*Mangifera indica* L.	Tree
24.	*Semecarpus anacardium* L.f.	Tree
	ANNONACEAE	
25.	*Annona squamosa* L.	Tree
26.	*Polyalthia longifolia* (Sonner) Thw.	Tree
	APIACEAE	
27.	*Centella asiatica* (L.) Urb.	Creeping herb
	APOCYNACEAE	
28.	*Adenium obesum* (Forssk) Roem. & Schult.	Shrub
29.	*Allamanda blanchetii* A. DC.	Shrub
30.	*Boucerosia lasiantha* Wight	Succulent herb
31.	*Boucerosia procumbens* (Gravely & Mayur.) Plowes	Succulent herb
32.	*Boucerosia umbellata* (Haw.) Wight & Arn.	Succulent herb
33.	*Calotropis gigantea* (L.) R. Br.	Shrub
34.	*Caralluma adscendens* var. *attenuata* (Wight) Grav. & Mayur.	Succulent herb
35.	*Caralluma adscendens* var. *fimbriata* (Wall.) Gravely & Mayur.	Succulent herb
36.	*Caralluma bhupinderiana* Sarkaria	Succulent herb
37.	*Caralluma stalagmifera* C.E.C. Fisch.	Succulent herb
38.	*Carissa spinarum* L.	Shrub
39.	*Cascabela thevetia* (L.) Lippold	Shrub
40.	*Catharanthus pusillus* (Murr.) G. Don	Herb
41.	*Catharanthus roseus* (L.) G. Don	Herb
42.	*Hemidesmus indicus* (L.) R. Br.	Twiner
43.	*Nerium indicum* Mill.	Shrub
44.	*Oxystelma esculentum* (L.f.) Sm.	Twiner

45.	*Pentatropis capensis* (L.f.) Bull	Twiner
46.	*Pergularia daemia* (Forssk.) Chiov.	Twiner
47.	*Plumeria rubra* L.	Tree
48.	*Plumeria alba* L.	Tree
49.	*Plumeria pudica* Jacq.	Shrub
50.	*Rauvolfia serpentina* (L.) Benth. ex Kurz.	Herb
51.	*Vincetoxicum indicum* (Burm.f.) Mabb.	Twiner
52.	*Wattakaka volubilis* (L. f.) Stapf	Twiner
	APONOGETONACEAE	
53.	*Aponogeton natans* (L.) Engl. & K. Krause	Herb
	ARACEAE	
54.	*Alocasia macrorrhizos* (L.) G. Don	Herb
55.	*Colocasia esculenta* (L.) Schott	Shrub
56.	*Caladium bicolor* (Aiton) Vent.	Herb
57.	*Rhaphidophora pertusa* (Roxb.) Schott	Shrub
	ARAUCARIACEAE	
58.	*Araucaria araucana* (Molina) K. Koch	Tree
	ARECACEAE	
59.	*Borassus flabellifer* L.	Tree
60.	*Caryota urens* L.	Tree
61.	*Cocos nucifera* L.	Tree
62.	*Dypsis lutescens* (H. Wendl.) Beentje & J. Dransf	Tree
63.	*Phoenix sylvestris* (L.) Roxb.	Tree
64.	*Phoenix dactylifera* L.	Tree
65.	*Roystonea regia* (Kunth) O.F. Cook	Tree
66.	*Rhapis excelsa* (Thunb.) A. Henry	Shrub
67.	*Wodyetia bifurcata* A.K. Irvine	Tree
	ASPARAGACEAE	
68.	*Asparagus racemosus* Willd.	Shrub
69.	*Chlorophytum laxum* R. Br.	Herb
70.	*Dracaena marginata* Aiton	Herb
71.	*Dracaena reflexa* Lam.	Herb
72.	*Drimia indica* (Roxb.) Jessop.	Herb
73.	*Sansevieria roxburghiana* Schult. & Schult.f.	Herb

74.	*Scilla hyacinthina* (Roth) J.F. Macbr.	Herb
	ASPHODELACEAE	
75.	*Aloe vera* (L.) Burm.f.	Herb
	ASTERACEAE	
76.	*Ageratum conyzoides* L.	Herb
77.	*Blumea mollis* Merr.	Herb
78.	*Chromolaena odorata* (L.) R.M. King & H. Rob.	Shrub
79.	*Eclipta alba* (L.) Hassk.	Herb
80.	*Emilia sonchifolia* (L.) DC.	Herb
81.	*Glossocardia bosvallea* (L.f.) DC.	Herb
82.	*Gymnanthemum extensum* (DC.) Steetz.	Shrub
83.	*Parthenium hysterophorus* L.	Herb
84.	*Pentanema indicum* (L.) Y. Ling	Herb
85.	*Pulicaria wightiana* (DC.) Clarke.	Herb
86.	*Tridax procumbens* L.	Herb
87.	*Vernonia albicans* DC.	Herb
88.	*Vernonia cinerea* (L.) Less.	Herb
	BIGNONIACEAE	
89.	*Dolichandrone falcata* Seem.	Tree
90.	*Millingtonia hortensis* L.	Tree
91.	*Tecoma stans* (L.) Kunth.	Tree
92.	*Tabebuia chrysantha* (Jacq.) G. Nicholson	Tree
93.	*Tabebuia rosea* (Bertol.) Bertero ex A. DC.	Tree
94.	*Spathodea campanulata* P. Beauv.	Tree
	BORAGINACEAE	
95.	*Coldenia procumbens* L.	Herb
96.	*Cynoglossum zeylanicum* Thunb. ex Brand	Herb
97.	*Heliotropium bracteatum* R. Br.	Herb
98.	*Heliotropium strigosum* willd.	Herb
99.	*Trichodesma indicum* (L.) R.Br.	Herb
	CACTACEAE	
100.	*Cereus pterogonus* Lem.	Succulent shrub

101.	*Opuntia stricta* (Haw.) Haw.	Succulent shrub
102.	*Opuntia dillenii* (Ker Gawl.) Haw.	Succulent shrub
103.	*Opuntia stricta* (Haw.) Haw.	Succulent shrub
	CANNACEAE	
104.	*Canna indica* L.	Shrub
	CASUARINACEAE	
105.	*Casuarina equisetifolia* L.	Tree
	CLEOMACEAE	
106.	*Cleome viscosa* L.	Herb
	CONVOLVULACEAE	
107.	*Evoluvlus alsinoides* (L.) L.	Herb
108.	*Evolvulus nummularius* (L.) L.	Herb
109.	*Ipomoea aquatica* Forssk.	Twiner
110.	*Ipomoea cairica* (L.) Sweet Hort.	Twiner
111.	*Ipomoea coptica* (L.) Roem. & Schult.	Twiner
112.	*Ipomoea marginata* (Desr.) Verdc.	Twiner
113.	*Ipomoea obscura* (L.) Ker.-Gawl.	Twiner
114.	*Ipomoea pes-caprae* (L.) R. Br.	Twiner
115.	*Merremia aegyptica* (L.) Urban	Twiner
116.	*Merremia tridentata* (L.) Hallier f.	Twiner
117.	*Rivea hypocrateriformis* (Desr.) Choisy	Twiner
	COMBRETACEAE	
118.	*Conocarpus erectus* L.	Tree
119.	*Terminalia arjuna* (Roxb. ex DC.) Wight & Arn.	Tree
120.	*Terminalia catappa* L.	Tree
121.	*Terminalia mantaly* H. Perrier	Tree
	COMMELINACEAE	
122.	*Commelina benghalensis* L.	Herb
123.	*Commelina erecta* L.	Herb
124.	*Commelina ensifolia* R. Br.	Herb

125.	*Commelina diffusa* Burm.f.	Herb
126.	*Cyanotis fasciculata* (Roth) Schult. & Schult.f.	Herb
127.	*Murdannia spirata* (L.) G. Brückn.	Herb
128.	*Tonningia axillaris* (L.) Kuntze	Herb
129.	*Tradescantia pallida* (Rose) D.R. Hunt	Herb
	COSTACEAE	
130.	*Costus speciosus* (J. Koenig) Sm.	Shrub
	CRASSULACEAE	
131.	*Kalanchoe blossfeldiana* Poelln.	Herb
	CUCURBITACEAE	
132.	*Coccinia grandis* (L.) Voigt.	Climber
133.	*Citrullus colocynthis* (L.) Schrad.	Climber
	CUPRESSACEAE	
134.	*Thuja occidentalis* L.	Tree
135.	*Cupressus sempervirens* L.	Tree
	CUSCUTACEAE	
136.	*Cuscuta reflexa* Roxb.	Parasite
	CYCADACEAE	
137.	*Cycas revoluta* Thunb.	Tree
	CYPERACEAE	
138.	*Abildgaardia triflora* (L.) Abeywick.	Herb
139.	*Bulbostylis barbata* (Rottb.) C.B. Clarke	Herb
140.	*Cyperus arenarius* Retz.	Herb
141.	*Cyperus articulatus* L.	Herb
142.	*Cyperus corymbosus* Rottb.	Herb
143.	*Cyperus compressus* L.	Herb
144.	*Cyperus exaltatus* Retz.	Herb
145.	*Cyperus flavidus* Retz.	Herb
146.	*Cyperus rotundus* L.	Herb
147.	*Fimbristylis cymosa* R. Br.	Herb
148.	*Fimbristylis dichotoma* (L.) Vahl	Herb
149.	*Fimbristylis miliacea* (L.) Vahl	Herb
150.	*Fimbristylis ovata* (Burm.f.) J. Kern	Herb
151.	*Fuirena ciliaria* (L.) Roxb.	Herb

152.	*Kyllinga brevifolia* Rottb.	Herb
153.	*Kyllinga bulbosa* P. Beauv.	Herb
154.	*Pycreus polystachyos* (Rottb.) P. Beauv.	Herb
155.	*Schoenoplectiella articulata* (L.) Lye	Herb
	ELATINACEAE	
156.	*Bergia ammannioides* Roxb.	Herb
	EUPHORBIACEAE	
157.	*Acalypha alnifolia* Willd.	Herb
158.	*Acalypha indica* L.	Herb
159.	*Croton bonplandianum* Bail.	Herb
160.	*Codiaeum variegatum* (L.) Rumph. ex A. Juss.	Succulent shrub
161.	*Euphorbia heterophylla* L.	Herb
162.	*Euphorbia milii* Des Moul.	Succulent shrub
163.	*Euphorbia hirta* L.	Herb
164.	*Euphorbia rosea* Retz.	Herb
165.	*Jatropha glandulifera* Roxb.	Shrub
166.	*Jatropha gossypiifolia* L.	Shrub
167.	*Pedilanthus tithymaloides* (L.) Poit.	Shrub
168.	*Tragia involucrata* L.	Shrub
169.	*Tragia plukenetii* Radcl.-Sm.	Shrub
	FABACEAE	
170.	*Abrus precatorius* L.	Twiner
171.	*Acacia aurculiformis* A. Cum ex. Benth.	Tree
172.	*Acacia leucophloea* (Roxb.) Willd.	Tree
173.	*Acacia nilotica* (L.) Del.	Tree
174.	*Aeschynomene aspera* L.	Herb
175.	*Aeschynomene indica* L.	Herb
176.	*Albizia lebbeck* (L.) Willd	Tree
177.	*Albizia saman* (Jacq.) F. Muell.	Tree
178.	*Alysicarpus bupleurifolius* (L.) DC.	Herb
179.	*Alysicarpus hamosus* Edgew.	Herb
180.	*Atylosia scarabaeoides* (L.) Benth.	Twiner

181.	*Bauhinia acuminata* Vell.	Tree
182.	*Bauhinia purpurea* L.	Tree
183.	*Bauhinia racemosa* Vahl	Tree
184.	*Caesalpinia pulcherrima* (L.) Sw.	Shrub
185.	*Canavalia gladiata* (Jacq.) DC.	Twiner
186.	*Cassia auriculata* L.	Shrub
187.	*Cassia fistula* L.	Tree
188.	*Cassia occidentalis* L.	Shrub
189.	*Cassia senna* L.	Herb
190.	*Clitoria ternatea* L.	Twiner
191.	*Crotalaria angulata* Mill.	Herb
192.	*Crotalaria hebecarpa* (DC.) Rudd.	Herb
193.	*Crotalaria medicaginea* var. *medicaginea* Lam.	Herb
194.	*Crotalaria ramosissima* Roxb.	Herb
195.	*Delonix regia* (Hook.) Rafin.	Tree
196.	*Desmodium triflorum* (L.) DC.	Herb
197.	*Dichrostachys cinerea* (L.) Wight & Arn.	Tree
198.	*Indigofera linifolia* (L.f.) Retz	Herb
199.	*Indigofera linnaei* Ali	Herb
200.	*Leucaena leucocephala* (Lam.) Dewit	Tree
201.	*Macroptilium atropurpureum* (DC.) Urb.	Herb
202.	*Mimosa pudica* L.	Herb
203.	*Neptunia triquetra* (Vahl) Benth.	Herb
204.	*Peltophorum pterocarpum* (DC.) Heyne	Tree
205.	*Pongamia pinnata* (L.) Pierre	Tree
206.	*Prosopis chilensis* (Molina)Stuntz	Tree
207.	*Pterocarpus santalinus* L.f.	Tree
208.	*Rhynchosia capitata* DC.	Twiner
209.	*Rhynchosia minima* (L.) DC.	Twiner
210.	*Saraca asoca* (Roxb.) J.J.de Wilde	Tree
211.	*Senna uniflora* (Mill.) H.S. Irwin & Barneby	Herb
212.	*Stylosanthes fruticosa* (Retz.) Alston	Shrub
213.	*Stylosanthes hamata* (L.) Taub.	Herb

214.	*Tephrosia pumila* (Lam.) Pers.	Herb
215.	*Tephrosia purpurea* (L.) Pers.	Herb
216.	*Vigna radiata* (L.) Wilczek	Climber
217.	*Vigna trilobata* (L.) Verdc.	Climber
	GENTIANACEAE	
218.	*Enicostemma axillare* (Lam.) Rayn	Herb
	HYDROCHARITACEAE	
219.	*Halophila ovalis* (R.Br.) Hook.f.	Herb
220.	*Hydrilla verticillapa* (L.f.) Royle	Herb
221.	*Ottelia alismoides* (L.) Pers.	Herb
222.	*Vallisnaria spiralis* Roxb.	Herb
	HYPOXIDACEAE	
223.	*Curculigo orchioides* Gaertn.	Herb
	LAMIACEAE	
224.	*Gmelina arborea* Roxb. ex Sm.	Tree
225.	*Gmelina asiatica* L.	Tree
226.	*Hyptis suaveolens* (L.) Poit.	Shrub
227.	*Ocimum americanum* L.	Herb
228.	*Ocimum basilicum* L.	Herb
229.	*Ocimum sanctum* L.	Herb
230.	*Leonotis nepetiifoila* (L.) R. Br.	Shrub
231.	*Leucas aspera* (Willd.) Link	Herb
232.	*Leucas cephalotes* (Roth.) Spreng.	Herb
	LAURACEAE	
233.	*Cassytha filiformis* L.	Parasite
	LEMNACEAE	
234.	*Lemna aequinoctialis* Welw.	Herb
	LYTHRACEAE	
235.	*Ammannia baccifera* Roth.	Herb
236.	*Lawsonia inermis* L.	Tree
	MALVACEAE	
237.	*Abutilon hirtum* (Lam.) Sweet.	Shrub
238.	*Abutilon indicum* (L.) Sweet.	Shrub

239.	*Hibiscus rosa-sinensis* L.	Shrub
240.	*Hibiscus vitifolius* L.	Shrub
241.	*Malvastrum coromandelianum* (L.) Garcke	Shrub
242.	*Sida acuta* Burm.f.	Herb
243.	*Sida cordata* (Burm.f) Borssum	Herb
244.	*Sida cordifolia* L.	Herb
245.	*Thespesia populnea* (L.) Corr.	Tree
246.	*Urena lobata* L.	Shrub
	MELIACEAE	
247.	*Azadirachta indica* A. Juss.	Tree
248.	*Melia azedarach* L.	Tree
249.	*Swietenia mahagoni* (L.) Jacq.	Tree
	MENISPERMACEAE	
250.	*Cocculus hirsutus* (L.) Diels	Twiner
251.	*Tinospora cordifolia* (Willd.) Hook.f. & Thoms.	Twiner
	MENYANTHACEAE	
252.	*Nymphoides hydrophylla* (Lour.) Kuntze	Herb
	MAGNOLIACEAE	
253.	*Magnolia champaca* (L.) Baill. ex Pierre	Tree
	MORACEAE	
254.	*Artocarpus heterophyllus* Lam.	Tree
255.	*Ficus benghalensis* L.	Tree
256.	*Ficus benjamina* L.	Tree
257.	*Ficus hispida* L.f.	Tree
258.	*Ficus racemosa* L.	Tree
259.	*Ficus religiosa* L.	Tree
260.	*Ficus variegate* Blume	Tree
261.	*Morus alba* L.	Tree
	MORINGACEAE	
262.	*Moringa pterigosperma* Gaertn.	Tree
	MOLLUGINACEAE	
263.	*Glinus oppositifolius* (L.) A. DC.	Herb

264.	*Mollugo nudicaulis* Lam.	Herb
265.	*Mollugo pentaphylla* L.	Herb
	MUNTINGIACEAE	
266.	*Muntingia calabura* L.	Tree
	MYRTACEAE	
267.	*Psidium* guajava L.	Tree
268.	*Syzygium cumini* (L.) Skeels	Tree
	NYMPHAEACEAE	
269.	*Nelumbo nucifera* Gaertn.	Aquatic herb
270.	*Nymphaea nouchali* Burm.f.	Aquatic herb
271.	*Nymphaea pubescens* Willd.	Aquatic herb
272.	*Nymphaea rubra* Roxb. ex Andrews	Aquatic herb
	NYCTAGINACEAE	
273.	*Boerhavia diffusa* L.	Herb
274.	*Boerhavia erecta* L.	Herb
275.	*Bougainvillea glabra* Choisy	Herb
276.	*Bougainvillea spectabilis* (pink)	Shrub
	OLEACEAE	
277.	*Jasminum flexile* Vahl	Shrub
278.	*Nyctanthes arbor-tristis* L.	Tree
	ONAGRACEAE	
279.	*Ludwigia adscendens* (L.) H. Hara	Herb
280.	*Ludwigia octovalvis* (Jacq.) P.H. Raven	Herb
281.	*Ludwigia perennis* L.	Herb
	OXALIDACEAE	
282.	*Biophytum sensitivum* (L.) DC.	Herb
	PASSIFLORACEAE	
283.	*Passiflora foetida* L.	Climber
	PEDALIACEAE	
284.	*Martynia annua* L.	Herb
285.	*Pedalium murex* L.	Herb

	PHYLLANTHACEAE	
286.	*Flueggea leucopyrus* Willd.	Shrub
287.	*Phyllanthus amarus* Schumach. & Thonn.	Herb
288.	*Phyllanthus emblica* L.	Tree
289.	*Phyllanthus maderaspatensis* L.	Herb
290.	*Phyllanthus reticulatus* Poir.	Herb
291.	*Phyllanthus rotundifolius* Klein ex Willd.	Herb
292.	*Phyllanthus virgatus* Forst.f.	Herb
293.	*Ricinus communis* L.	Shrub
294.	*Sauropus bacciformis* (L.) Airy Shaw	Herb
	PLUMBAGINACEAE	
295.	*Plumbago zeylanica* L.	Herb
	PLANTAGINACEAE	
296.	*Bacopa monnieri* (L.) Wettst.	Herb
	PONTEDERIACEAE	
297.	*Eichhornia crassipes* (Mart.) Solms	Herb
298.	*Monochoria vaginalis* (Burm.f.) C. Presl	Herb
	PORTULACACEAE	
299.	*Portulaca oleracea* L.	Herb
300.	*Portulaca quadrifida* L.	Herb
	POLYGALACEAE	
301.	*Polygala arvensis* Willd.	Herb
	POLYGONACEAE	
302.	*Antigonon leptopus* Hook. & Arn.	Creeper
	POACEAE	
303.	*Alloteropsis cimicina* (L.) Stapf	Herb
304.	*Andropogon pumilus* Roxb.	Herb
305.	*Apluda mutica* L.	Herb
306.	*Aristida adscensionis* L.	Herb
307.	*Aristida hystrix* L.f.	Herb
308.	*Aristida funiculata* Trin & Rupr.	Herb
309.	*Aristida setacea* Retz.	Herb
310.	*Brachiaria distachya* (L.) Stapf	Herb

311.	*Brachiaria ramosa* (L.) Stapf	Herb
312.	*Brachiaria remota* (Retz.) Haines	Herb
313.	*Cenchrus biflorus* Roxb.	Herb
314.	*Cenchrus ciliaris* L.	Herb
315.	*Chloris barbata* Sw.	Herb
316.	*Chloris quinquesetica* Bhide	Herb
317.	*Chrysopogon fulvus* (Spr.) Chiov.	Herb
318.	*Chrysopogon zizanioides* (L.) Roberty	
319.	*Coelachyropsis lagopoides* Bor	Herb
320.	*Cynodon barberi* Rang. & Tadul.	Herb
321.	*Cynodon dactylon* (L.) Pers.	Herb
322.	*Cymbopogon coloratus* (Hook.f.) Stapf	Herb
323.	*Dactyloctenium aegyptium* (L.) Beauv.	Herb
324.	*Dichanthium annulatum* (Forssk.) Stapf	Herb
325.	*Dichanthium caricosum* (L.) A. Camus	Herb
326.	*Digitaria bicornis* (Lam.) Roem & Schult.	Herb
327.	*Digitaria ciliaris* (Retz.) Koeler	Herb
328.	*Echinochloa colona* (L.) Link	Herb
329.	*Echinochloa crusgalli* (L.) Beauv.	Herb
330.	*Enteropogon monostachyos* (Vahl) Schum. ex Engl.	Herb
331.	*Eragrostiella bifaria* (Vahl) Bor	Herb
332.	*Eragrostis nutans* (Retz.) Steud	Herb
333.	*Eragrostis pilosa* (L.) Beauv.	Herb
334.	*Eragrostis tenella* (L.) P. Beauv. ex Roem. & Schult.	Herb
335.	*Eragrostis unioloides* (Retz.) Nees ex Steud.	Herb
336.	*Eragrostis viscosa* (Retz.) Trin.	Herb
337.	*Heteropogon contortus* (L.) Beauv.	Herb
338.	*Imperata cylindrica* (L.) P. Beauv.	Herb
339.	*Iseilema anthephoroides* Hack.	Herb
340.	*Iseilema prostratum* (L.) Andersson	Herb
341.	*Melanocenchris jacquemontii* Jaub. & Spach	Herb
342.	*Melanocenchris monoica* (Rottl.) Fischer	Herb

343.	*Oropetium thomaeum* (L.f.) Trin.	Herb
344.	*Panicum notatum* Retz.	Herb
345.	*Panicum repens* L.	Herb
346.	*Panicum trypheron* Schult.	Herb
347.	*Perotis indica* (L.) O. Ktze.	Herb
348.	*Saccharum spontaneum* L.	Herb
349.	*Setaria pumila* (Poir.) Roem. & Schult.	Herb
350.	*Setaria verticillata* (L.) Beauv.	Herb
351.	*Sporobolus coromandelianus* (Retz.) Kunth	Herb
352.	*Trachys muricata* (L.) Pers. ex Trin.	Herb
353.	*Vetiveria zizanioides* (L.) Nash	Herb
	RHAMANACEAE	
354.	*Ziziphus mauritiana* Lam.	Tree
355.	*Ziziphus oenopolia* (L.) Mill.	Tree
	RUBIACEAE	
356.	*Catunaregum spinosa* (Thumb.) Tirv.	Shrub
357.	*Canthium parviflorum* Lam.	Shrub
358.	*Dentella repens* (L.) J.R. Forst. & G. Forst.	Herb
359.	*Hedyotis aspera* Roth.	Herb
360.	*Hedyotis corymbosa* (L.) Lam.	Herb
361.	*Hedyotis puberula* (G. Don.) Arn.	Herb
362.	*Ixora arborea* G. Lodd.	Shrub
363.	*Ixora chinensis* Lam.	Shrub
364.	*Ixora coccinea* L.	Shrub
365.	*Spermacoce hispida* L.	Herb
366.	*Spermacoce pusilla* Wall.	Herb
	SAPINDACEAE	
367.	*Cardiospermum halicacabum* L.	Twiner
368.	*Dodonaea viscosa* Jacq	Shrub
	SAPOTACEAE	
369.	*Mimusops elengi* L.	Tree
	SCROPHULARIACEAE	

370.	*Sopubia delphinifolia* (L.) G. Don.	Herb
371.	*Striga angustifolia* (D. Don) C.J. Saldanha	Herb
372.	*Striga asiatica* (L.) O. Ktze.	Herb
373.	*Striga densiflora* (Benth.) Benth.	Herb
374.	*Limnophila indica* (L.) Druce	Herb
375.	*Lindernia antipoda* (L.) Alston	Herb
376.	*Scoparia dulcis* L.	Herb
	SOLANACEAE	
377.	*Physalis minima* L.	Herb
	STERCULIACEAE	
378.	*Waltheria indica* L.	Herb
	TILIACEAE	
379.	*Corchorus capsularis* L.	Herb
380.	*Corchorus olitorius* L.	Herb
381.	*Corchorus trilocularis* L.	Herb
382.	*Triumfetta pentandra* A. Rich	Herb
383.	*Triumfetta rhomboidea* Jacq.	Herb
	TURNERACEAE	
384.	*Turnera ulmifolia* L.	Herb
	TYPHACEAE	
385.	*Typha angustata* Bory & Chaub.	Shrub
	VERBENACEAE	
386.	*Duranta erecta* L.	Herb
387.	*Lantana camara* L.	Shrub
388.	*Phyla nodiflora* (L.) Greene	Herb
389.	*Stachytarpheta jamaicensis* (L.) Vahl.	Herb
390.	*Tectona grandis* L.f.	Tree
	VITACEAE	
391.	*Cissus quadrangularis* L.	Climber
	VIOLACEAE	
392.	*Hybanthus enneaspermus* (L.) F.V. Muell	Herb

Enumeration of Plants in VSU College, Kavali

S. No.	Name of the plant	Family	Local (Telugu) Name	Habit
1	*Abelmoschus moschatus* Medic.	Malvaceae	Kasturi benda	**S**
2	*Abrus precatorius* L.	Fabaceae	Guruvinda, guruginja	**C**
3	*Abutilon crispum* (L.) Medik.	Malvaceae		**SS**
4	*Abutilon indicum* (L.) Sweet	Malvaceae	Thutturu benda, Duvvena kayalu	**S**
5	*Acacia auriculifarmis* A.Cunn. Ex Benth.	Mimosaceae	Australia thumma	**T**
6	*Acacia leucophloea* (Roxb.) Willd.	Mimosaceae	Tella thumma	**T**
7	*Acacia nilotica* (L.) Willd. ex Del.subsp. indica	Mimosaceae	Nalla thumma	**T**
8	*Acalypha ciliata* Forssk.	Euphorbiaceae	Nugu kuppinta	**SS**
9	*Acalypha indica* L.	Euphorbiaceae	Pippintaku, Kuppintaku	**H**
10	*Acalypha wilkesiana* Müell.-Arg.	Euphorbiaceae		**S**
11	*Achyranthes aspera* L. var.aspera Wt.	Amaranthaceae	Uttareni	**H**
12	*Aegle marmelos* (L.) Corr.	Rutaceae	Maaredu	**T**
13	*Aerva lanata* (L.) Juss.ex Schult.	Amaranthaceae	Kondapindi	**H**
14	*Aeschynomene aspera* L.	Fabaceae	Neetijeeluga	**H**
15	*Agave americana* L.	Agavaceae	Kittanara	**H**
16	*Ageratum conyzoides* L.	Asteraceae	vasavi	**H**
17	*Albizia lebbeck* (L.) Willd.	Mimosaceae	Dirisena, Siresha puspam	**T**
18	*Albizia saman* (Jacq.) Merr.	Mimosaceae	Nidraganneru	**T**
19	*Allamanda cathartica* L.	Apocynaceae	Allenandatheega	**C**
20	*Allophyllus serratus* (Roxb.) Kurz.	Sapindaceae	Chinna Sali kunkudu	**S**
21	*Aloe vera* (L.) Burm.f.	Liliaceae	Kalabanda	**H**
22	*Alternanthera paranychoides* A.St.Hil.	Amaranthaceae		**H**
23	*Alternanthera pungens* Kunth.	Amaranthaceae	Mullaponnaganti	**H**
24	*Alternanthera tenella* Colla	Amaranthaceae		**H**
25	*Alysicarpus vaginalis* (L.) DC.	Fabaceae	Baramthalu chettu	**H**
26	*Alysicarpus monilifer* (L.) DC.	Fabaceae	Amera	**H**
27	*Amaranthus spinosus* L.	Amaranthaceae	Mullathotakoora, Doggali	**H**
28	*Amaranthus tricolor* L.	Amaranthaceae	Perugu thotakoora	**H**
29	*Amaranthus viridis* L.	Amaranthaceae	Chilaka thotakoora, Kodijuttuaku	**H**
30	*Ammannia baccifera* L.	Lythraceae	Agnivendram	**H**
31	*Andrographis echioides* (L.) Nees	Acanthaceae	Deepala chettu	**H**
32	*Andrographis paniculata* L.	Acanthaceae	Nelavemu	**H**

33	*Anisomeles indica* (L.) Kuntze	Lamiaceae	Magabeera	**SS**
34	*Anisomeles malabarica* L.	Lamiaceae	Aadabeera	**SS**
35	*Annona squamosa* L.	Annonaceae	Seeta phalam	**T**
36	*Antigonum leptopus*Hook. & Arn.	Polygonaceae	Yerra battanitheega	**C**
37	*Araucaria columnaris* (Forst.) Hk.	Araucariaceae	Christmas tree	**T**
38	*Aristalochia bracteolata* Lam.	Aristalochiaceae	Gadidhagadapa, Thellaeswari	**H**
39	*Aristalochia indica* L.	Aristalochiaceae	Nallaeswari	**H**
40	*Aristida adscensionis* L.	Poaceae	Cheeprupulla, Porakagaddi	**H**
41	*Artemesia pallens* Wall. ex DC.	Asteraceae	Machipathri	**H**
42	*Artocarpus heterophyllus* Lam.	Moraceae	Panasa	**T**
43	*Asclepias curassavica* L.	Apocynaceae	Jilledu Mandara, Agni Jilledu,	**H**
44	*Asparagus racemosus* (Kunth) Jessop	Liliaceae	Pillitheegalu, Sathavari	**C**
45	*Asparagus spinosus* (Kunth) Jessop	Liliaceae	Laavu Pilli Gaddalu	**H**
46	*Asystasia gangetica* (L.) T.Anderson	Acanthaceae	Podabeera	**H**
47	*Azadirachta indica* A. Juss.	Meliaceae	Vepa	**T**
48	*Azima tetracantha* Lam.	Salvadoraceae	Paalakaya	**S**
49	*Bambusa vulgaris* Schrad.	Poaceae	Veduru	**S**
50	*Barleria prionitis* L.	Acanthaceae	mulla gorinta	**H**
51	*Basella alba* L. var. *rubra*	Basellaceae	bachhali aku	**C**
52	*Bauhinia purpurea* L.	Caesalpiniaceae	Devakanchanam	**T**
53	*Blepharis madaraspatensis* (L.) Heyne ex Roth.	Acanthaceae		**H**
54	*Blepharis repens* (Vahl.) Roth	Acanthaceae		**H**
55	*Boerhavia diffusa* L.	Nyctaginaceae	Atikamamidi, Punarnava	**H**
56	*Boerhavia erecta* L.	Nyctaginaceae	Punarnava	**H**
57	*Bougainvillea spectabilis* Willd.	Nyctaginaceae	Kagithala puvvu	**SS**
58	*Brachiaria mutica* (Forssk.) Stapf	Poaceae		**H**
59	*Brachiaria ramosa (*L.)	Poaceae	Eduguru gaddi	**H**
60	*Brachiaria reptans* (L.) Gard & Hubb.	Poaceae		**H**
61	*Bryophyllum pinnatum* (Lam.) Oken	Crassulaceae		**H**
62	*Bulbostylis barbata* (Rottb.) Kunth	Cyperaceae		**SS**
63	*Caesalpinia pulcherrima (*L.) Sw	Caesalpiniaceae	Chinna turayi, Pydi thangedu	**SS**
64	*Caeslapinia bonduc* (L.) Roxb.	Caesalpiniaceae	Gachakaya	**SS**
65	*Calotropis gigantea* (L.) R.Br.	Asclepiadaceae	Tella Jilledu	**S**
66	*Calotropis procera* (Ait.) R.Br.	Asclepiadaceae	Erra Jilledu	**S**

67	*Canna indica* L.	Cannaceae	Metta tamara	**H**
68	*Canthium dicoccum* (Gaertn.) Teijsm.& Binn.	Rubiaceae	Nalla balusu	**T**
69	*Capparis zeylanica* L.	Capparaceae	Aridonda, Tella uppi	**C**
70	*Caralluma indica* (Wight & Arn.)	Asclepiadaceae	Kundelu kommulu	**H**
71	*Cardiospermum helicacabum* L.	Sapindaceae	Budda kakara	**C**
72	*Cardiospermum canescens* Wall.	Sapindaceae	Chinna buddabusara	**C**
73	*Carissa spinarum* L.Mnt. Var.spinarum	Apocynaceae	Chinna kalivi	**S**
74	*Cassia absus* L.	Caesalpiniaceae	Chanupala vithulu	**SS**
75	*Cassia fistula* L.	Caesalpiniaceae	Seema rela	**T**
76	*Cassytha filiformis* L.	Lauraceae	Pasi teega, Seethammavari savaralu	**P**
77	*Casuarina equisetifolia* Forst. & Forst f.	Casuarinaceae	Sarugudu	**T**
78	*Catharanthus roseus* (L.) G.Don	Apocynaceae	Billa ganneru	**H**
79	*Catunaregam spinosa* (Thunb.) Tirven.	Rubiaceae	Chinna manga	**S**
80	*Celosia argentea* L. var. argentea	Amaranthaceae	Gurugaku, Tella Kodijuttu	**H**
81	*Celosia polygonoides* Retz.	Amaranthaceae	Eluka uttareni	**H**
82	*Centella asiatica* (L.) Urban	Apiaceae	Saraswathiaku, Mandukaparni	**H**
83	*Ceropegia adscendens* Var. *attenuata* Roxb.	Asclepiadaceae		**H**
84	*Ceropegia indica* (Wight & Arn.) Bruyns	Asclepiadaceae		**H**
85	*Chloris barbata* Sw.	Poaceae	Uppu gaddi, Jada kunchula gaddi	**H**
86	*Chlorophytum laxum* R.Br.	Liliaceae		**H**
87	*Cissus quadrangularis* L.	Vitaceae	Nalleru	**C**
88	*Cissus triangularis* L.	Vitaceae		**C**
89	*Citrullus colocynthis* (L.) Schrad.	Cucurbitaceae	Verri pucchakaya	**C**
90	*Citrus aurantifolia* (Christm.)	Rutaceae	Nimma	**T**
91	*Cleome gynandra* L.	Cleomaceae	Vominta	**H**
92	*Cleome viscosa* L.	Cleomaceae	Kukka vaminta	**H**
93	*Clitoria ternata* L.	Fabaceae	Sankhupushpi	**C**
94	*Coccinia grandis* L.	Cucurbitaceae	Donda	**C**
95	*Cocculus hirsutus* (L.) W.Theob.	Menispermaceae	Dusara teega	**C**
96	*Cocos nucifera* L.	Arecaceae	Kobbari, tenkaya	**T**
97	*Codiaeum variegatum* (L.) A.Juss.	Euphorbiaceae		**S**
98	*Coldenia procumbens* L.	Boraginaceae	Chepputhattaku	**H**
99	*Commelina benghalensis* L.	Commelinaceae	Vennedra, Venna veduru	**H**

100	*Commelina diffusa* Burm.f.	Commelinaceae		**H**
101	*Commelina longifolia* Lam.	Commelinaceae		**H**
102	*Conocarpus erectus* L.	Combretaceae	Button chettu	**T**
103	*Convolvulus arvensis* L.	Convolvulaceae	Savarala teega	**H**
104	*Corchorus olitorius* L.	Tiliaceae	Janumu, Parinthakoora	**H**
105	*Corchorus trilocularis* L.	Tiliaceae	Bankaku	**H**
106	*Costus speciosus* (Koen.) Smith	Costaceae	Bomma-kachika, vana vasa	**SS**
107	*Crinum asiaticum* L.	Amaryllidaceae	Chengalva	**H**
108	*Crossandra infundibuliformis* (L.) Nees	Acanthaceae	Kanakambaram	**H**
109	*Crotalaria angulata* Mill.	Fabaceae		**H**
110	*Crotalaria hirta* Willd.	Fabaceae		**H**
111	*Croton bonplandianum* Baill.	Euphorbiaceae	Galivana mokka	**H**
112	*Cucumis melo* L.	Cucurbitaceae	Budama teega	**C**
113	*Cucumis sativus* L.	Cucurbitaceae	Dosakaya	**C**
114	*Cucurbita pepo* L.	Cucurbitaceae	Pottigummadi	**C**
115	*Cuscuta reflexa* Roxb.	Convolvulaceae	Sitamma pogunalu	**P**
116	*Cyanotis cristata* (L.) D.Don	Commelinaceae	Netha kina	**H**
117	*Cyanotis fasciculata* (B.Heyne ex Roth) Schult. and Schult.f.	Commelinaceae	Golla gundi	**H**
118	*Cycas circinalis* L.	Cycadaceae	Perita	**T**
119	*Cycas sphaerica* Roxb.	Cycadaceae	Kodhada chettu	**T**
120	*Cymbopogon citratus* (DC.) Stapf	Poaceae	Nimma gaddi, Chippara gaddi	**H**
121	*Cynodon dactylon* (L.) Pers.	Poaceae	Garika	**H**
122	*Cyperus pangorei* Rottb.	Cyperaceae		**H**
123	*Cyperus pumilus* L.	Cyperaceae		**H**
124	*Cyperus rotundus* L. *tuberosus*	Cyperaceae	Thunga mustalu	**H**
125	*Dactyloctenium aegyptium* (L.) Willd.	Poaceae	Nela ragi	**H**
126	*Datura fastuosa* L.	Solanaceae		**S**
127	*Datura innoxia* Mill.	Solanaceae	Karu ummetta, Tella ummettu	**S**
128	*Datura metal* L.	Solanaceae	Chinna ummetta	**S**
129	*Delonix regia* (Boj. ex Hook.) Rafin.	Caesalpiniaceae	Turayi	**T**
130	*Dendropthoe falcata* (L.f.) Ett. Var. *falcata*	Loranthaceae	Kukkanaluka, Badanika	**C**
131	*Desmodium pulchellum* (L.) Benth.	Fabaceae	Deyyapu mokku, Nemalipinchamu	**S**
132	*Dichrostachys cinerea* (L.) Wighth & Arn	Mimosaceae	Veluturu	**T**
133	*Dieffenbachia camilla*	Araceae		**S**
134	*Digera muricata* (L.) Mart.	Amaranthaceae	Chenchalicettu	**H**
135	*Digitaria sanguinalis* (Persl)	Poaceae		**H**

	Miq.			
136	*Dioscorea bulbifera* L.	Dioscoreaceae	Chedupaddudumpa	**C**
137	*Dioscorea oppositifolia* L.	Dioscoreaceae	Adavi dumpatheega	**C**
138	*Diospyros ferrea* (Willd.) Bakh.	Ebenaceae	Pisinika	**C**
139	*Diplocyclos palmatus* L.	Cucurbitaceae	Linga donda	**C**
140	*Dodonoea viscosa* (L.) Jacq	Sapindaceae	Bandaru, Banderu	**S**
141	*Dolichandrone falcata* var. *falcata*	Bignoniaceae	Neeruddi	**S**
142	*Dracaena braunii* Engl.	Agavaceae		**SS**
143	*Duranta repens* L.	Verbenaceae	Damayanti	**SS**
144	*Ecbolium viride* (Forssk.) Alston	Acanthaceae	Neelambaramu	**H**
145	*Echinochloa crus-galli* (L.) P.Beauv.	Poaceae	Pedda windu	**H**
146	*Eclipta prostrata* L.	Asteraceae	Guntakalagara, Kaatukaaku	**H**
147	*Ehretia microphylla* L.	Cordiaceae	Bavanaburei	**S**
148	*Elytraria acaulis* (L. f.) Lindau	Acanthaceae	Yeddu adugu	**H**
149	*Enicostemma littorale* L.	Gentianaceae	Nela gulimidi	**H**
150	*Eragrostis minor* Host	Poaceae		**H**
151	*Eragrostis tenella* (L.) P.Beauv. ex Roem. & Schult.	Poaceae	Chinna Garikagaddi	**H**
152	*Eriocaulon cinereum* R.Br.	Eriocaulaceae		**H**
153	*Ervatamia divaricata* (L.) Burkill.	Apocynaceae	Garudavardanam	**S**
154	*Eucalyptus globulus* Labill.	Myrtaceae	Neelagiri, Jamail	**T**
155	*Euphorbia antiquorum* L.	Euphorbiaceae	Bonta Jemudu	**S**
156	*Euphorbia heterophylla* L.	Euphorbiaceae		**S**
157	*Euphorbia hirta* L.	Euphorbiaceae	Nanubalu, Patchabottu	**H**
158	*Euphorbia microcarpa*(Prokh.) Krylov.	Euphorbiaceae		**H**
159	*Euphorbia milii* Des Moul.	Euphorbiaceae	Mullakuchu chettu	**H**
160	*Euphorbia pulcherrima* Willd. ex	Euphorbiaceae	Yerrakula jamudu	**S**
161	*Euphorbia tirucalli* L.	Euphorbiaceae	Kada jemudu, Katimandu	**S**
162	*Evolvulus alsinoides* L.	Convolvulaceae	Vishnukranthamu	**H**
163	*Evolvulus nummularius* L.	Convolvulaceae	Eluka Cheviaku	**H**
164	*Ficus benghalensis* L.	Moraceae	Marri	**T**
165	*Ficus microcarpa* L.f. 1782	Moraceae		**H**
166	*Ficus religiosa* L.	Moraceae	Raavi	**T**
167	*Fimbristylis aestivalis* (Retz.) Vahl	Cyperaceae		**H**
168	*Fimbristylis ferruginea* (L.) Vahl	Cyperaceae		**H**
169	*Garcinia gummi-gutta* (L.) Robs.	Malphigiaceae	Thamala	**T**
170	*Gisekia pharnaceoides* L.	Molluginaceae	Isaka danthi	**H**

171	*Glinus lotoides* L.	Molluginaceae	Chadarasi koora, Tella puni	**H**
172	*Gloriosa superba* L.	Cochlaceae	Nabhi, Agni sikha	**C**
173	*Gmelina asiatica* L.	Verbenaceae	Gummudu	**S**
174	*Gomphrena globosa* L.	Amaranthaceae	Bondu malli	**H**
175	*Gomphrena serrata* L.	Amaranthaceae	Thella pogadabanti	**H**
176	*Gymnema sylvestre* R.Br.	Asclepiadaceae	Podapathri	**C**
177	*Hedyotis aspera* L.	Rubiaceae	Sanna parapatamu	**H**
178	*Hedyotis tuberella* L.	Rubiaceae		**H**
179	*Heliotropium indicum* L.	Boraginaceae	Naga danthi	**H**
180	*Hemidesmus indicus* (L.) R. Br. ex Schult.	Periplocaceae	Sugandhapala	**H**
181	*Hemidesmus indicus* var. *pubescens* Hook..	Periplocaceae	Pedda sugandhapala	**C**
182	*Hibiscus micranthus* L.f.	Malvaceae	Chukkamalli	**H**
183	*Hibiscus rosa-sinensis* L.	Malvaceae	Mandara	**S**
184	*Hibiscus lobatus* Kuntz.	Malvaceae	Atakanara, Tella benda	**H**
185	*Hybanthus enneaspermus* (L.) F.Muell.	Violaceae	Ratna purusha	**H**
186	*Hyptis suaveolens* (L.) Poit.	Lamiaceae	Kukka tulasi	**SS**
187	*Indigofera linifolia* (L.f.) Retz.	Fabaceae	Gudlaku	**H**
188	*Indigofera linnaei* Ali	Fabaceae	Yerra palleru, Cheragadam	**H**
189	*Indigofera tinctoria* L.	Fabaceae	Neeli	**SS**
190	*Indigofera trifolia* L.	Fabaceae	Baragadam, Miripindi	**SS**
191	*Ipomoea carnea* Jacq.	Convolulaceae	Thutukada	**C**
192	*Ipomoea cornata* L.	Convolvulaceae		**C**
193	*Ipomoea quamoclit* L.	Convolvulaceae	Kasiratnalu	**C**
194	*Ixora coccinia* L.	Rubiaceae	Rama banam, Nooru varahalu	**S**
195	*Jasminum olitorius* Wight	Oleaceae	Adavi sannajaji	**C**
196	*Jatropha curcas* L.	Euphorbiaceae	Adavi amudam, Pedda	**S**
197	*Justicia prostrata* Gamble	Acanthaceae		**H**
198	*Justisia adathoda* L.	Euphorbiaceae	Addasaramu	**S**
199	*Lannea coromandelica* (Houtt.) Merr.	Anacardiaceae	Gumpina	**T**
200	*Lantana camara* var. *aculeata* (L.) Moldenke	Verbenaceae	Pulikampa	**S**
201	*Lawsonia inermis* L.	Lythraceae	Gorinta	**S**
202	*Lepidagathis cristata* Willd.	Acanthaceae	Nakka pintuka	**H**
203	*Leucaena leucocephala* (Lam.) de Wit	Mimosaceae	Chandra chettu	**T**
204	*Limonia acidissima* L.	Rutaceae	Velaga	**T**
205	*Ludwigia perennis* L.	Onagraceae	Lavanga kaaya	**H**

206	*Lycopersicon esculentum* Miller	Solanaceae	Ramamulaga pandu	**H**
207	*Malvastrum coromandelianum* (L.) Garcke	Malvaceae		**H**
208	*Mangifera indica* L.	Anacardiaceae	Mamidi	**T**
209	*Melochia corchorifolia* L.	Sterculiaceae	Ganugapindikura	**H**
210	*Merremia aegyptia* L.	Convolvulaceae	Elukajemuda	**C**
211	*Merremia emarginata* (Burm. f.) Hallier f.	Convolvulaceae	Nallakulatheega	**H**
212	*Merremia tridentata* (L.) Hallier f.	Convolvulaceae	Mududantla aku	**H**
213	*Michelia champaca*	Magnoliaceae	Chettusampanga	**T**
214	*Micrococca mercurialis* (L.)Benth.	Euphorbiaceae		**H**
215	*Millingtonia hortensis* L. f.	Bignoniaceae	Kada malle, Manu sampenga	**T**
216	*Mimosa pudica* L.	Mimosaceae	Atti patti	**SS**
217	*Mollugo nudicaulis* Lam.	Molluginaceae	Peddaparapatakam	**H**
218	*Mollugo oppositifolia* L.	Molluginaceae	Chayuntarashi	**H**
219	*Mollugo pentaphylla* L.	Molluginaceae	Verri chatarasi	**H**
220	*Momordica charantia* L.	Cucurbitaceae	Kakara	**C**
221	*Monstera deliciosa* Liebm.	Araceae		**H**
222	*Monsua allicea*	Bignoniaceae	Tellagaddaku	**C**
223	*Moringa oleifera* Lam.	Moringaceae	Munaga	**T**
224	*Morus alba* L.	Moraceae	Pattu prugulu chettu	**SS**
225	*Murraya koenigii* (L.) Spreng.	Rutaceae	Karivepaku	**T**
226	*Musa paradisiaca* L.	Musaceae	Arati	**T**
227	*Neolamarckia cadamba* (Roxb.) Bosser	Rubiaceae	Kadamba	**T**
228	*Nerium oleander* L.	Apocynaceae	Erra ganneru	**S**
229	*Ocimum basilicum* L.	Lamiaceae	Sabja	**H**
230	*Ocimum gratissimum* L.	Lamiaceae	Rama tulasi	**H**
231	*Ocimum tenuiflorum* L.	Lamiaceae	Vishnu tulasi	**H**
232	*Oldenlandia corymbosa* L.	Rubiaceae	Vernnela-vemu	**H**
233	*Oldenlandia umbellata* L.	Rubiaceae	Parapatakamu	**H**
234	*Opuntia dillenii* (Ker Gawl.) Haw.	Cactaceae	Nagajamudu	**S**
235	*Oxalis corniculata* L.	Oxalidaceae	Pulichinta	**H**
236	*Panicum psilopodium* Trin.	Poaceae	Pattu pullu	**H**
237	*Parthenium hysterophorus* L.	Asteraceae	Vayyaribhama	**H**
238	*Paspalidium flavidum* (Retz.) A.Camus	Poaceae	Udagaddi	**H**
239	*Passiflora edulis* L.	Passifloraceae	Jukamalli	**C**
240	*Pavonia odorata* Willd.	Malvaceae	Chittibenda	**H**
241	*Pavonia zeylanica* (L.) Cav.	Malvaceae	Karubenda	**H**
242	*Pedalium murex* L.	Pedaliaceae	Yenugu palleru	**H**
243	*Peltophorum pterocarpum* (DC.)	Caesalpiniaceae	Kondachintha	**T**

244	*Pergularia daemia* (Forssk.) Chiov.	Asclepiadaceae	Dustapu theega	**C**
245	*Perotis indica* (L.) Ktze.	Poaceae	Nakka thokagaddi, Nakka peechu	**H**
246	*Phyla nodiflora* (L.) Greene	Verbenaceae	Bokkenaku, Gaja pippalakada	**H**
247	*Phyllanthus amarus* Schumach. & Thonn.	Euphorbiaceae	Nela usuri	**H**
248	*Phyllanthus emblica* L.	Euphorbiaceae	Usiri	**T**
249	*Phyllanthus maderaspatensis* L.	Euphorbiaceae	Nalla usuri, Kukka usuri	**H**
250	*Phyllanthus reticulatus* Poir.	Euphorbiaceae	Nallapurugudu	**SS**
251	*Phyllanthus virgatus* G.Forst.	Euphorbiaceae	Gadavusuri	**H**
252	*Physalis minima* L.	Solanaceae	Budda budama	**H**
253	*Piper betel* L.	Piperaceae	Thamalapaku	**C**
254	*Pithecalobium dulce* (Roxb.) Benth.	Mimosaceae	Chema chinta	**T**
255	*Plectranthus amboinicus* (Lour.) Spreng.	Lamiaceae	Vamakku	**SS**
256	*Plumbago zeylanica* L.	Plumbaginaceae	Chitramulam	**SS**
257	*Plumeria rubra* L.	Apocynaceae	Deva ganneru	**T**
258	*Polyalthia longifolia* (Sonner) Thw.	Annonaceae	Naramamidi, Asoka	**T**
259	*Pongamia pinnata* (L.) Pierre	Fabaceae	Ganuga/Kamu	**T**
260	*Portulaca grandiflora* L.	Portulacaceae	Peddapayalaku	**H**
261	*Portulaca oleracea* L.	Portulacaceae	Payalaku	**H**
262	*Pouzolzia zeylanica* (L.) Benn	Urticaceae	Eddumuthi dumpa	**S**
263	*Prosopis chilensis* (Molina) Stuntz	Mimosaceae	Kara tumma, Kanche	**T**
264	*Pseudobrachiaria deflexa* (Schum.) Laun. In Mitt.	Poaceae		**H**
265	*Psidium guajava* L.	Myrtaceae	Jama	**T**
266	*Psilotrichum elliotii* Baker & Clarke	Amaranthaceae	Chinnakattula chettu	**H**
267	*Pterocarpus santalinus* L. f.	Fabaceae	Erra chandanam	**T**
268	*Punica granatum* L.	Punicaceae	Danimma	**T**
269	*Pupalia lappacea* (L.) Juss.	Amaranthaceae	Thella uttareni	**H**
270	*Putranjiva roxburghii* Wall.	Euphorbiaceae	Puttaranjivi	**S**
271	*Rhinacanthus nasutus* L.	Acanthaceae	Nagamalliakku	**S**
272	*Rhynchosia heynei* Wt. & Arn.	Fabaceae	Teega kandi	**SS**
273	*Ricinus communis* L.	Euphorbiaceae	Aamudam	**S**
274	*Rivea hypocrateriformis* Choisy	Convolvulaceae	Pedda boddithеega	**C**
275	*Rivea ornata* (Roxb.)	Convolvulaceae	Boddithеega	**C**
276	*Rosa centifolia* L.	Rosaceae	Roja	**SS**
277	*Rostellularia patula* L.	Acanthaceae		**H**
278	*Rungia repens* (L.) Nees	Acanthaceae	Kharmor	**SS**

279	*Sansveria roxburghiana* (Schult. & Schult.f.) Kuntze.	Agavaceae	Saga	**H**
280	*Santalum album* L.	Santalaceae	Chandanam, Gandam	**T**
281	*Sapindus emarginatus* Vahl.	Sapindaceae	Kunkudu, Ritta kaya	**T**
282	*Saraca asoca* (Roxb.) de Wilde	Caesalpiniaceae	Ashoka chettu	**T**
283	*Sarcostemma secamone* (L.) Bennet	Asclepiadaceae	Palatheega, Vanthulatheega	**C**
284	*Scilla hyacinthina* (Roxb.) Macbr.	Liliaceae	Adavi thellagadda	**H**
285	*Senna tora* (L.) Roxb.	Fabaceae	Peddakasinda, Tagirisa	**H**
286	*Sesamum alatum* Thonn	Pedaliaceae	Adavinuvvulu, Pichinuvvulu	**H**
287	*Sida acuta* Burm.f.	Malvaceae	Medabirusaku	**H**
288	*Sida cordata* (Burm.f.) Borss.Waalk.	Malvaceae	Gayapaku	**H**
289	*Sida cordifolia* L.	Malvaceae	Bala, Chirubenda	**H**
290	*Sida linifolia* L.	Malvaceae		**H**
291	*Sida rhombifolia* L.	Malvaceae	Guba thada, Athibala	**H**
292	*Solanum nigrum* L.	Solanaceae	Kamanchi, Kasaka	**H**
293	*Solanum surattense* Burm. f.	Solanaceae	Errivanga, Vakudu, Nelamuluka	**H**
294	*Solanum torvum* Sw.	Solanaceae	Vushti	**H**
295	*Spermacoce hispida* L.	Rubiaceae	Madanakattaku	**H**
296	*Spermacoce stricta* (Wall.) DC.	Rubiaceae	Tsukka-kada, Pachanuri	**H**
297	*Stachytarpheta jamaicensis* (L.) Vahl	Verbenaceae	Ceemal-nayurur	**H**
298	*Synedrella nodiflora* L.	Asteraceae	Pacha chettu	**H**
299	*Syzygium cumini* (L.) Skeels	Myrtaceae	Neredu	**T**
300	*Talinum portulacifolium* (Vahl.)Willd.	Portulacaceae	Seema bacchali	**H**
301	*Tamarindus indica* L.	Caesalpiniaceae	Chinta	**T**
302	*Tecoma stans* (L.) Kunth	Bignoniaceae	Swarna ganneru	**S**
303	*Tectona grandis* L. f.	Verbenaceae	Teku	**T**
304	*Tephrosia purpurea* (L.) Pers.	Fabaceae	Vempali	**H**
305	*Tephrosia strigosa* (Dalz.) Sant. & Mahes.	Fabaceae		**H**
306	*Tephrosia villosa* L.	Fabaceae	Nugu vempali	**H**
307	*Terminalia arjuna* (Roxb. DC.)	Combretaceae	Tella maddi	**T**
308	*Terminalia catappa* L.	Combretaceae	Nattu badam, Tapasataruvu	**T**
309	*Thespesia populnea* L.	Malvaceae	Gangaravi, Gangireni	**T**
310	*Thuja orentalis* L.	Cupressaceae	Thuja	**S**
311	*Thunbergia fragrans* Roxb.	Acanthaceae	Idratheega	**C**

312	*Tinospora cardifolia* L.	Menispermaceae	Tippa teega, dussiramu	**H**
313	*Tradescantia bracteata* L.	Commelinaceae		**H**
314	*Tradescantia spathacea* Sw.	Commelinaceae		**H**
315	*Trianthema decandra* L.	Aizoaceae	Thella galijeru	**H**
316	*Trianthema portulacastrum* L.	Aizoaceae	Nadaraku, Yerra galijeru	**H**
317	*Tribulus terrestris* L.	Zygophyllaceae	Sanna Palleru	**H**
318	*Trichodesma indicum* (L.) Lehm.	Boraginaceae	Guvvagutti, Adhopushpi, Neeli Nakshathralu	**H**
319	*Trichosanthes tricuspidata* Lour.	Cucurbitaceae	Avaduta	**C**
320	*Tridax procumbens* L.	Asteraceae	Gaddi chamanthi	**H**
321	*Tylophora indica* L.	Asclepiadaceae	Kakkupala, Meka meyyani aaku,Verri pala	**C**
322	*Typhonium trilobatum* (L.) Schott.	Araceae	Chema kachu	**H**
323	*Vanda tesellata* (Roxb.)Hook. Ex G. Don	Orchidaceae	Kanapabadanika, chittiveduri	**E**
324	*Vernonia cinerea* (L.) Less.	Asteraceae	Sahadevi	**H**
325	*Vernonia amygdalina* Del.	Asteraceae	Sugar plant	**SS**
326	*Vetiveria zizanoides* (L.) Nash.	Poaceae	Vetiverlu	**S**
327	*Vitex negundo* L.	Verbenaceae	Vavili	**T**
328	*Waltheria indica* L.	Sterculiaceae	Nalla benda	**H**
329	*Ziziphus jujuba* Mill.	Rhamnaceae	Badari	**S**
330	*Ziziphus mauritiana* Lam.	Rhmnaceae	Regu chettu	**T**
331	*Ziziphus rugosa* Lam.	Rhamnaceae	Kondaregu, Peddaregu	**S**
332	*Zizyphus oenoplia* (L.) Mill	Rhamnaceae	Pariki	**S**
333	*Zizyphus xylopyrus* (Retz.) Wild.	Rhamnaceae	Gotti, Gotiki	**T**
334	*Zornia diphylla* var. *glochidiata* DC	Fabaceae	Nela bariki	**H**
335	*Zephyranthes ajax* Spr.	Amaryllidaceae	Pudaka valli, Vurumu poolu	**H**

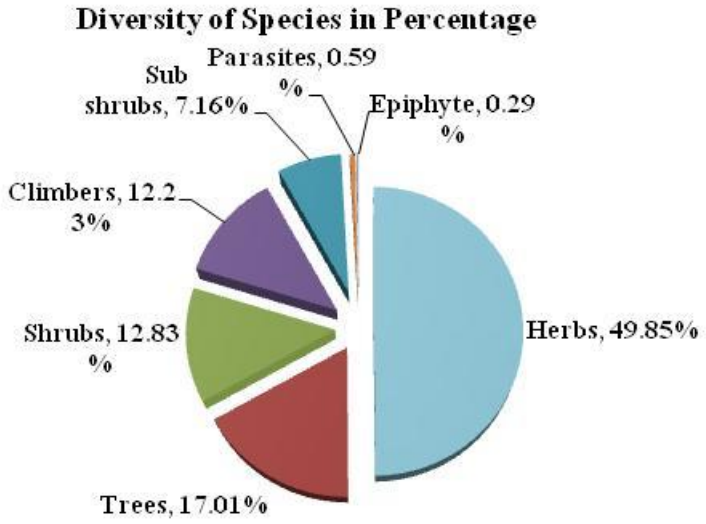

Fig.1. Diversity of Plant Species according to their habits

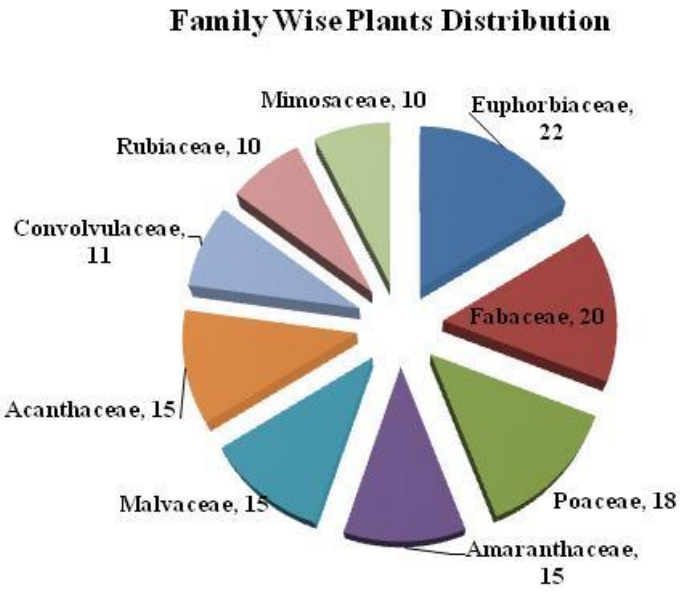

Fig.2. Family wise Distribution of Flora in VSU College, Kavali Campus

LIST OF FAUNAL SPECIES

SNO	Species Type	Common Name	Scientific Name
1	Amphibian	Indian Bull Frog	*Rana tigrina*
2	Amphibian	Indian pond frog	*Euphlyctishexadactylus*
3	Amphibian	Common Indian Toad	*Bufo melanostictus*
4	Amphibian	Common Tree Frog	*Polypedates maculates*
5	Amphibian	Indian Bull frog	*Hoplobratrachus tigerinus*
6	Amphibian	Jerdons Bull Frog	*Hoplobatrachus crassus*
7	Arthropoda	Honey Bee	*Apis mellifera*
8	Arthropoda	Centipede	*Scolopendra Hardwickei*
9	Arthropoda	Crimson Rose Butterfly	*Pachliopta hector*
10	Arthropoda	Painted Grasshopper	*Poecilocerus pictus*
11	Arthropoda	Lychee Shield Bug	*Chrysocorisstolli*
12	Arthropoda	Cockroach	*Periplaneta americana*
13	Arthropoda	Ant	*Oecophyllas maragdina*
14	Arthropoda	House fly	*Musca domestica*
15	Arthropoda	Mosquito	*Anopheles*
16	Arthropoda	Mosquito	*Culex*
17	Arthropoda	Scorpion	*Centruroides vittatus*
18	Annelida	Earth worm	*Lumbricus terrestris*
19	Aves (Birds)	Kaki	*Corvus splendens*
20	Aves (Birds)	Palapitta	*Coracias benghalensis*
21	Aves (Birds)	Ramachiluka	*Psittacula krameri*
22	Aves (Birds)	Gudla Guba	*Athene brama*
23	Aves (Birds)	Vadrangagipitta	*Micropternusbrachyurus*
24	Aves (Birds)	Pichuka	*Passer domesticus*
25	Aves (Birds)	Gorinka	*Acridotheres tristis*
26	Aves (Birds)	Rose ringed Parakeet	*Psittaculakramerimanillensis*
27	Aves (Birds)	Common Myna	*Acridotheres tristis*
28	Aves (Birds)	Common Jungle Crow	*Corvus macrorhynchus*
29	Aves (Birds)	Great Erget	*Ardea alba*

30	Aves (Birds)	Common tailor bird	*Orthotomus sutorius*
31	Aves (Birds)	Pigeon	*Columba livia*
32	Insect	Common Nawab	*Polyura athamas*
33	Insect	Common Emigrant	*Catopsilia pomona*
34	Insect	Common Brush brown	*Mycalesis perseus*
35	Insect	Common Mormon	*Papiliopolytes*
36	Insect	Common tiger	*Danaus genutia*
37	Insect	Ant	*Solenopsis*
38	Insect	Striped Tiger	*Danaus genutia*
39	Insect	Fruit fly	*Drosophila melanogaster*
40	Insect	Blue tiger	*Tirumala limniace*
41	Insect	Crimson Tip	*Colotisdanae*
42	Insect	Great Eggfly	*Hypolimnasbolina*
43	Insect	Common Leopard	*Phalantaphalantha*
44	Insect	Midatha	*Caelifera.L*
45	Insect	Black Garden ant	*Lasiusniger*
46	Insect	Danaid Eggfly	*Hypolimnasmisippus*
47	Insect	Lesser Grass Blue	*Zizinaotis*
48	Insect	Common Pierrot	*Castaliusrosimon*
49	Insect	Boddinka	*Periplaneta americana*
50	Insect	Bee fly	*Bombyliidae*
51	Insect (Butterfly)	Common jay	*G. doson*
52	Insect (Butterfly)	Common rose	*Pachlioptaa ristolochiae*
53	Insect (Butterfly)	Common merun	*P. memnon*
54	Insect (Butterfly)	The black tail	*P. liomedon*
55	Insect (Butterfly)	Common albatross	*Appias albino*
56	Insect (Butterfly)	Common emigrant	*Catopsilia crocale*
57	Insect (Butterfly)	Common gull	*Cepora nerissa*
58	Insect (Butterfly)	Common jezebel	*Delias eucharis*
59	Insect (Butterfly)	Common grass yellow	*Eurema hecabe*
60	Insect (Butterfly)	Small grass yellow	*Eurema brigitta*
61	Insect (Butterfly)	Three spot grass yellow	*Euremablanda*

62	Insect (Butterfly)	Common wanderer	*Valeria valeriaanais*
63	Insect (Butterfly)	Plain tiger	*Danaus chrysippus*
64	Insect (Butterfly)	Blue tiger	*Tirumala limniace*
65	Insect (Butterfly)	Rustic	*Cuphaerymanthis*
66	Mammal	Monkey	*Macaca fascicularis*
67	Mammal	Eluka	*Mus musculus*
68	Mammal	kundelu	*Lepus nigricollis*
69	Mammal	Gabbilam	*Microchiropeta L.*
70	Mammal	Adavi Pandi	*Wild Boar Herpestes.L*
71	Mammal	Pandi Kokku	*Field Bandicoot*
72	Mammal	Chunchu	*Common Shrew*
73	Mammal	Squirrel	*Funambulus palmarum*
74	Mammal	Dog	*Canis familiaris*
75	Mammal	Deer (Krihna jinka)	*Axis axis*
76	Reptiles	Wall lizard	*Hemidactylus flaviviridis*
77	Reptiles	Chameleon	*Chameleo zeylanicus*
78	Reptiles	House Lizard	*Hemidactylus frenatus*
79	Reptiles	Garden lizard	*Calotes versicolor*
80	Reptiles	Termite Gecko	*Hemidactylus triedrus*
81	Reptiles	Common Garden Lizard	*Calotes versicolor*
82	Reptiles	Common Skink	*Mabuyacarinata*
83	Snake	Common Indian Krait	*Bungarus caeruleus*
84	Snake	Russelle's Kukri Snake	*Oligodontae niolatus*
85	Snake	India Rat Snake	*Ptyasmucosus*
86	Snake	Indian Cobra	*Naja naja*

Plant diversitgy of VSU, Nellore Campuis















Flowering Plants of VSU, Nellore Campus














Green, Energy and Environmental Audit of the VS University …… 67

Insect Biodiversity of VSU, Nellore Campus













i) Green Programs (Green initiatives)

Due to minimum consideration for environment & sustainability, the world is facing problems of ozone depletion, climate change, water scarcity and sustainable resource management. The university organizes massive plantation programmes, awareness programmes , guest lectures on environmental conservation, biodiversity etc. every year.

Green Steps taken by the University:

University campuses were audited with respect to Green Audit Checklist developed by Hym International certifications Pvt. Ltd, Hyderabad Based on the data available for review, it is understood that since 5 years (2017-2021) university is actively taking initiatives in environment related activities. University has taken green initiatives by installing a renewable energy system, rainwater harvesting system, vermi composting, kitchen gardening, establishing Green Club, recycling process, promoting eco-friendly activities etc.

1. Buildings are specifically designed with wide windows and wide passages to utilise sunlight, and for ventilation.
2. University has more number of trees, shrubs and potted plants present in the campus.
3. University has initiated setting up a rooftop solar system of 100 KWH capacity in the main campus and Solar Water heaters for Women's hostel with the support of SEMCORB Energy Pvt. Ltd under CSR scheme
4. University has e-book facility in the library.
5. Understanding the importance of efficient energy use, university has initiated the process of replacing all incandescent lights with LEDs.
6. Solar lights are installed inside the womens hostel premises and also on University approach road.
7. For e-waste management, university has tied-up with E-waste recycler/ disposer.
8. University established an 'Green Clubs' and 'Extension activities Committees' in which students and staff involved in different environmental activities such as guest lecture programmes, green awareness camps, conferences, cleanliness drives in association with NSS etc.

OBSERVATIONS

1. Biodiversity: The university campus at Nellore and Kavali comprises of around 424 species of plants and 115 faunal species.
2. Green spaces: From 2017 to 2021, due to huge plantation at the VSU, Nellore and VSUPG Centre, Kavali the area of green space is increased tremendously.
3. Organic manure/fertilizers: One of the best initiatives to improve plantation is through organic farming. Farmers from Buranpur, Nellore district voluntarily supply organic manure to sustain plantation programmes organized by University via Clean and Green initiatives in association with NSS cell of the University.
4. Transportation: The fuel used for transportation of various plantation requirements is 2712 Litres per year. It is observed that the lawn maintenance is properly done and lawn mowing is high in October and November months. The fuel consumption is less than previous year.
5. Wide range of varieties are found in the campus. It observed that high number of Trees i.e., 30% and herbs i.e., 27% are found here. 11% shurbs, 9% grasses & cycads and 7% of medicinal Plants are seen. Though other species are in less number, this counts to high biodiversity of the campus.
6. Based on height the highest number of plants with 50 to 100 cms are 50.2% and more than 12 meters are 30%. Further very less height plants are 8 to 12 meters 0.7%.
7. It is observed that the water scarity considered during the plantation. 58% are normal water intake plants and 42% plants can tolerate less water also.
8. Most of the plants i.e., 40% are very long life span plants, 1% plants lifespan is 1 to 2 years and 33% plants lifespan is 6 to 12 months. Hence the plants are also well planned as per the lifespan.
9. Biodiversity of fauna: Increase in the plantation from 2017 to 2021 lead to the increase in the biodiversity of fauna. It is observed that a wide variety of butterflies followed by insects have been increased during the asessment year.
10. Water sources: The University at both the campuses has rainwater harvesting systems to avoid scarcity during summer season.
11. Medicinal plants: The University allocated a green space at VSU, Nellore to promote plnattaion of medicinal plants. So far, 70 species of medicinal plants have been planted at herbal garden and to promote green initiatve, the plants are distributed to

the local communitys as a part of environmental sustanability.

12. Involvement of students: Students of Clean and Green Committee in assoication with VSU NSS Cell are regularly involved in the plantation programmes conducted by the unversity.

RECOMMENDATIONS

1. **Plantation**:

   A)University Campus need more vegetation to increase carbon balance. Improve the beautification of the campus by planting more number of ornamental plants and enhancing the area for lawn. Further, plantation of avenue trees can be planned on eitherside of the approachable roads. Number of medicinal and aquatic plants in the herbal garden at VSU, Nellore and Botanical Garden at VSU, Kavali. Plan for plants that require less water to address the water problem.

   B)Proper enumeration of species is to be done for the documentation of biodiversity in the VSU PG center also and geotagging of the plants to be done in both the campuses for better monitering purpose.

1. C)University must conduct quality audits every year for improvement especially green spaces and better conservation and to track the flora and fauna species

2. **Waste Management:**
   a) Sorting and composting of solid waste collected in the campus can be scaled up for increaed production of compost to meet the requirement in the campus.
   b) Stepping up a little further an initiative can be undertaken wherein University can tie up with an organisation and students can be encouraged to collect dry waste and electronic waste such as newspapers, old computers and others and hand over to organisation on a weekly or monthly basis thereby making a waste reduction approach in the community. This has benefits such as awareness, eco-friendly habits in becoming a responsible citizen.
   c) Waste water recycling unit can be established for recycling grey water for gardening purpose.

3. **Energy & Water Conservation**
   A) Increase the number of roof top solar panels to increase the share of renewable energy resources
   B) Construct more number of rain water harvesting systems near bulding areas or farm ponds to recharge ground water levels.

C) Water in the large water tank available infornt of the University premises can be used for plantation to avoid water scarcity during summer season. Further, use drip irrigation and sprinklers for watering plants.

4. **Students activity**:

Initiate clean and green activities by increasing the students participation. This enables them to understand plant species and their conservation.

5. Others

a) Measures to be taken to increase the usage of bicycles inside the university campus

b) Local and national language can be included in all signages