GOVERNMENT COLLEGE KATTAPPANA

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(Affiliated to Mahatma Gandhi University, Kottayam)

ENVIRONMENTAL AUDIT REPORT

INTERNAL QUALITY ASSURANCE CELL

2015 - 16

INTRODUCTION

The campus environmental audit is a common tool that many colleges and universities have employed in recent years. A campus environmental audit is both a summary and a report card for a campus and a way to evaluate where and how resources are being used. An environmental audit is also the first step in being able to quantify whether or not current and future environmental efforts are actually making a difference. As such, an environmental audit is the beginning of the sustainability planning process. The results can be used to quantify what kind of impacts the campus community has okottan the environment and what steps the college can take to reduce these impacts.

The information from an environmental audit can be a starting point for researching pollution issues at any institution. An assessment of waste generation and energy consumption can highlight areas for potential intervention and provide a baseline for comparing subsequent increases or decreases in a specific waste stream. Performing an audit can also help facilitate the intervention process.

The Internal Quality Assurance Cell (IQAC) of Government College Kattappana has ventured to undertake an environmental audit of the college with the following objectives.

- To collect baseline environmental data about the college and campus
- To study and document the current practices regarding solid waste management, water and wastewater management and e-waste management
- To study the energy usage of the college
- To document the environmental friendly practice
- To promote environmental awareness

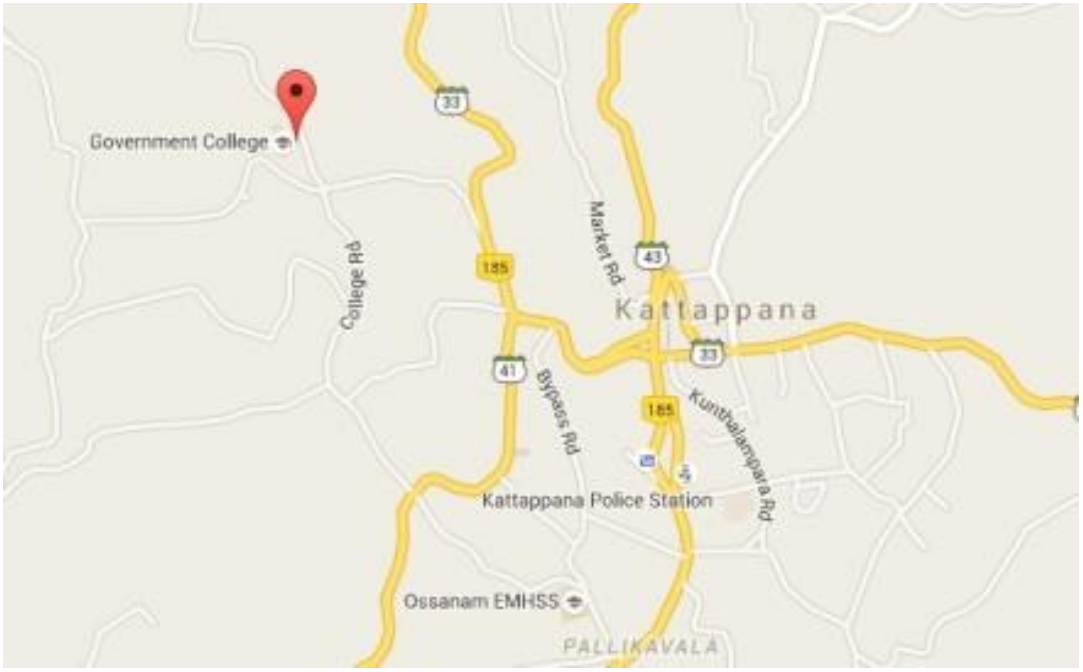
BASIC INFORMATION

Name of the institution	Government College Kattappana
Year of establishment	1977
Campus area	18.7 acres
Location	Vellayankudy – ITI Junction road, Kattappana
District and state in which the campus is situated	Idukki, Kerala
Name of local body in which the campus is situated	Kattappana Municipality
Coordinates	09.761N 77.105 E
Average height of campus above sea level	890 m
Access	Road – About 500 m from NH185, Thodupuzha- Puliyanmala Highway
Total built up area	7360 sq. meters
No. of programmes of study	7 Undergraduate – 5 Post graduate – 2
Total Number of students (sanctioned)	612
Total number of teaching staff	32
Total number of non-teaching staff	23

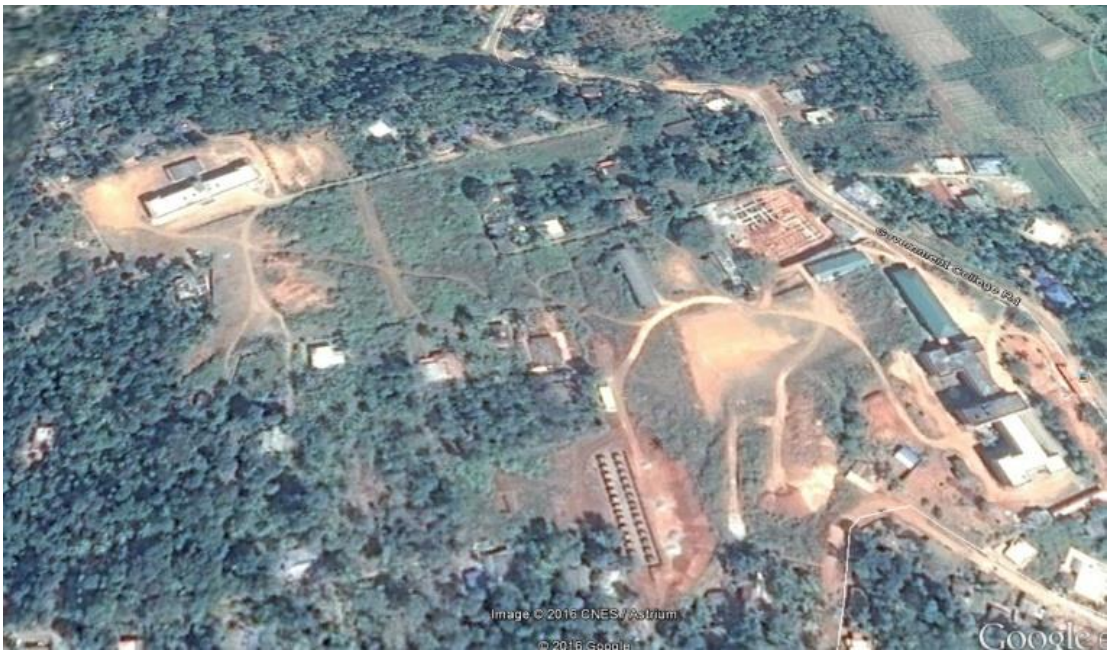
DETAILS OF BUILDINGS

Administrative and academic buildings	▪ Main building (administrative cum academic) o Three floors ▪ New academic block o Two floors
Hostels	▪ Men's Hostel o In the campus of College o Inmates: 35 o Two floors
Auditorium	▪ Seating Capacity: 300 ▪ Single floor
Canteen	▪ Seating Capacity: 50 ▪ Single floor
Other	▪ ASAP Skill park ▪ Canteen
Buildings under construction	▪ Women's hostel ▪ Library Block ▪ Staff Quarters
Rest room facilities	▪ Ladies rest room ▪ Boys Toilet
Sports facilities	▪ College ground – multipurpose ▪ Volleyball court
Parking facility	▪ Parking facility for staff
Water resources	▪ Open wells – 1 ▪ Bore wells – 3 ▪ Water harvesting facility o 10000 liters capacity
Other	▪ Dust bins and waste disposal pit ▪ Water taps

LOCATION MAP OF THE COLLEGE CAMPUS (COURTESY: GOOGLE MAPS)



SATELLITE MAP OF THE COLLEGE CAMPUS (COURTESY: GOOGLE EARTH)



SOLID WASTE MANAGEMENT

BIO DEGRADABLE WASTE

Main sources of bio-degradable waste in the campus	▪ Food waste ▪ Waste paper, card board etc. ▪ Paper carry bags and cartons ▪ Yard waste
Amount of bio-degradable waste generated per day	10-20 kg
Amount of bio-degradable waste generated per capita (one year)	~4 kg
Methods for collection of bio-degradable waste	▪ Waste bins have been placed in various places in the campus such as class rooms, portico and corridors. ▪ Waste pits have been constructed to collect food waste from students who bring meals to the college. ▪ Sweepers and sanitation workers have been employed.
Measures taken for disposal of bio-degradable waste	▪ Waste paper, cartons etc. are auctioned as per government rules ▪ Yard waste is used in the vegetable garden ▪ Students are instructed not to throw away solid waste in campus
Whether bio-degradable waste is disposed in the campus itself	Yes

Whether bio-degradable waste is disposed outside the campus	No
Methods of disposal for bio-degradable waste outside the campus	NA
Whether recycle mechanism available for bio-degradable waste	No

NON-BIODEGRADABLE WASTE

Sources of non-biodegradable waste in the campus	▪ Plastic carry bags ▪ Plastic bottles ▪ Packing materials of equipment purchased ▪ Waste chalk, pens, pencils and other stationery ▪ Chemicals and consumables from laboratories
Amount of non-biodegradable waste generated per year	70-80 kg
Methods for collection of non-biodegradable waste	▪ Waste bins have been placed in various places in the campus such as class rooms, portico and corridors. ▪ Sweepers and sanitation workers have been employed.
Measures taken for disposal of non-biodegradable waste	▪ Packing material, stationary etc. are auctioned as per government rules so as to avoid accumulation of non-degradable waste in the campus ▪ Chemical waste is disposed as per the existing regulations ▪ Use of plastic carriage bags are minimized ▪ Use of non-degradable cups and bottles are discouraged

Whether recycle mechanism available for non-biodegradable waste	No
Whether any hazardous chemical or biological waste is produced?	No
Whether hazardous chemical and biological waste is properly disposed?	NA

E-WASTE

Sources of e-waste in the campus	▪ Unserviceable computers, UPS, printers etc. ▪ Consumables such as cartridges, toners etc. ▪ Electronic components from laboratories ▪ Damaged computer parts such as keyboards, monitors etc. ▪ Replaced electronic boards of equipment ▪ Renovation of electric wiring
Methods for collection of e-waste	▪ E-waste is collected separately so as not to mix with bio-degradable waste
Measures taken for of disposal for e-waste	▪ As far as possible old cartridges and toners are taken over by the service firms ▪ Old electronic scrap is auctioned as per government rules ▪ Electronic components are reused in laboratories as far as possible
Whether e-waste is disposed in the campus itself	No
Whether e-waste is disposed outside the campus	No
Whether recycle mechanism available for e-waste	No

WATER AND WASTEWATER MANAGEMENT

WATER RESOURCES

Water resources available inside the campus	▪ Open wells ▪ Bore wells ▪ Rain water harvesting system
Whether the college depends on external water resources?	No
Whether water is available round the year?	Yes
Whether water resources are cleaned regularly?	Yes
Whether water quality has been analyzed?	No
Major findings of water quality analysis?	NA
Whether purified drinking water is available in college, hostels and canteen?	Yes
Methods used for water purification	▪ Water purifying systems have been installed for drinking water
Whether the college makes use of bore wells?	Yes
Whether the water usage pattern of the college causes depletion of ground water?	No
Whether water harvesting system is installed?	Yes
Capacity of water harvesting system	25000 litres

WATER USAGE

Daily water requirements of the campus (excluding hostels)	1500-2000 litres
Daily water requirements of the campus (including hostels)	3500-4000 litres
Per capita water usage (yearly)	400-500 litres
Whether tap water is available round the clock in the campus?	Yes
Whether tap water is available round the clock in hostels?	Yes
Whether purified drinking water is available?	Yes
Number of water purifiers / coolers installed?	3
Whether water tanks are cleaned regularly?	Yes
Whether annual maintenance of water supply and water purifiers is undertaken?	Yes
Whether repair of water leakage is promptly undertaken?	Yes
Whether judicious usage water is practiced and ensured on the campus?	Yes

WATER RESOURCE POTENTIAL

Average annual rainfall of the area in which the college is situated?	320 cm
Total roof area of buildings	1600 sq. m
Total installable capacity of water harvesting system	6 – 8 lakh litres
Capacity of water harvesting system installed	15000 litres
Percentage of total water requirements currently met by water harvesting system	< 10 %
Percentage of total water requirements that can be by water harvesting system if full potential is tapped	60 – 80 %
Potential for construction of check dam for water storage	No
Whether any natural bodies of water exist in the campus?	No

DRAINAGE AND WASTEWATER MANAGEMENT

Whether drainage system is in place for the flow of rainwater?	Yes
Sources of wastewater generated in the college	▪ Taps for students washing area ▪ Wastewater from canteen ▪ Wastewater from ladies hostel ▪ Wastewater from toilets inside the main building and other buildings ▪ Waste water from laboratories
Methods adopted for the disposal of wastewater in the college	▪ Septic tanks have been constructed ▪ Underground sewage disposal pits have been constructed
Whether wastewater flows through open drainage	No
Whether risk of drinking water sources getting contaminated by waste water exist?	No
Whether hazardous chemical or biological waste gets mixed with drainage?	No
Whether wastewater flows to the rainwater drainage system	No

ENERGY USAGE AND POLLUTION

ENERGY USAGE

How does the college meet its energy requirements?	▪ Electric connection from KSEB
Total connected power	~ 40 kW
Total electricity usage per month	~ 3000 kWH
Whether college has exclusive transformer in campus?	Yes
Whether generator facility is available?	Yes
Details of UPS facility	UPS are installed in Office and laboratories
Major power consumption equipment	▪ Water pumps ▪ Laboratory instruments ▪ Fans and Lights ▪ Photocopiers and printers ▪ Computers ▪ UPS
Whether judicious usage of electricity is ensured?	Yes
Whether energy star rating is ensured in the purchase of equipment?	Yes
Whether LED lighting systems are used?	No
Whether any renewable source of energy is used?	No
Potential for renewable energy usage	▪ High potential for solar energy generation

POLLUTION

Major sources of carbon footprint	▪ Electricity Usage ▪ Canteen and Hostel ▪ Laboratories ▪ Vehicles
Average carbon footprintper year	~ 15 tons (accounting for generation of electric power used)
Does the college has enough green cover for carbon neutrality?	Yes (for carbon emission inside campus) ~ 40 % (accounting for generation of electric power used)
Percentage of staff using public transport	~ 70 percent
Percentage of students using public transport	>95 percent
Whether any hazardous chemicals are emitted from laboratories and other facilities?	No
Whether usage of air conditioning is minimized?	Yes
Number of vehicles owned by the college	One Bus, 18 seats
Whether any major polluting industries are situated in the area?	No

ECO FRIENDLY INITIATIVES

CAMPUS ENVIRONMENT AND MAINTENANCE

Percentage of green cover of campus	~ 30 %
Does the campus have indigenous trees and plants?	Yes
Does the campus have indigenous fauna?	Yes
Whether steps are taken for conservation of trees and plants in the campus?	Yes
Whether comprehensive landscape management is in place?	Yes
Whether campus cleaning is conducted regularly?	Yes
Whether buildings, rooms, toilets etc. are cleaned on a daily basis?	Yes
Whether staff has been appointed for campus and building maintenance?	No
Whether annual maintenance of buildings is undertaken?	Yes
Whether repair of electric wiring and equipment is promptly undertaken?	Yes

ECO FRIENDLY PRACTICES

Eco friendly practices of the college	▪ Most of the faculty members and non-teaching staff use public transportation ▪ Almost all students use public transportation facilities ▪ Usage of plastic is minimized ▪ Trees have been planted in various places in the campus ▪ Students are made aware of the need for energy conservation. ▪ Students are instructed to keep the campus and classrooms clean ▪ Students participate in cleaning activities regularly ▪ Students participate in maintenance of the campus by planting trees
Clubs and organizations in the campus which have contributed to environmental awareness	▪ NSS ▪ NCC ▪ Nature Club ▪ Farm Club
Inclusion of environment related topics in syllabus	Topics related to environment have been included in the syllabus of • B Sc Chemistry
Programmes conducted for environmental awareness	▪ NSS camps ▪ Observation of Environmental day ▪ Observation of earth hour
Measures taken for ecofriendly resource usage and pollution control	▪ Sewage is not allowed to contaminate water resources ▪ The college ensures judicious use of electricity.

	▪ CRT monitors were replaced by LCD monitors ▪ Consumables are taken back for recycling by suppliers thereby reducing the amount of e-waste produced.
Major eco-friendly initiatives	▪ Vegetable garden ▪ Herbal garden ▪ Paddy cultivation ▪ Plantation of trees and saplings ▪ The campus is kept green by preserving trees and plants

CONCLUSION

The environmental audit has studied the practices of the college regarding solid waste management, water and wastewater management, energy usage and pollution and campus maintenance. It has also examined the ecofriendly initiatives of the college. It is observed that

- Solid waste is disposed in the campus itself
- The college meets its water requirements from sources in the college itself
- The amount of air pollution generated by the college is minimal
- The college has a large potential for rain water harvesting
- The college has a good potential for solar energy production

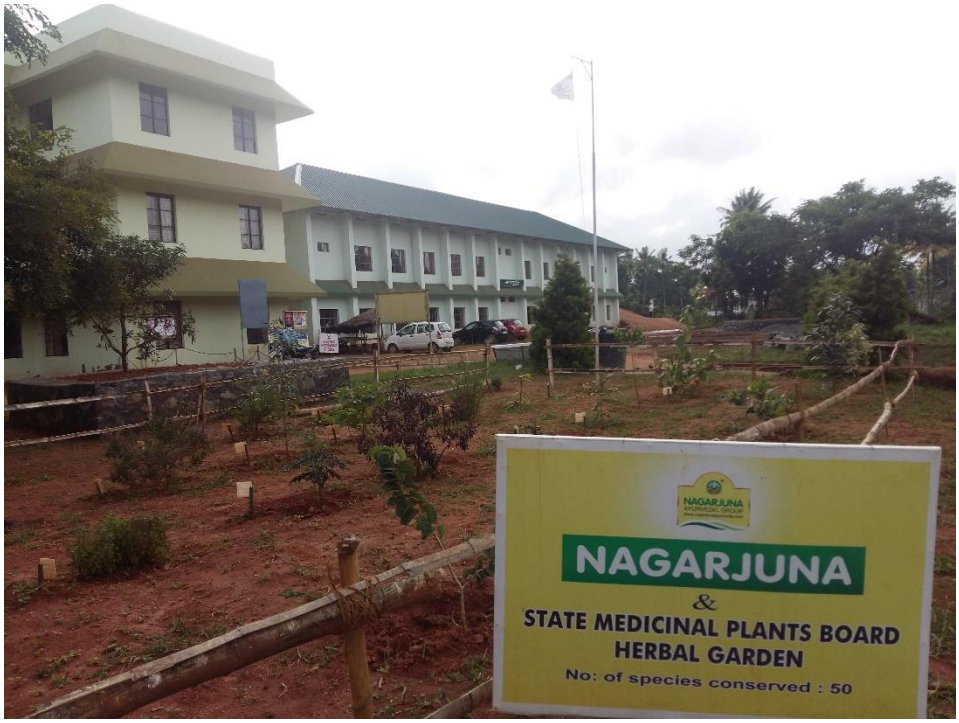
Recommendations

- Environmental audit may be conducted in every two years
- Recycling mechanism for solid waste may be installed
- An RO plant may be installed for centralized water purification
- Potential for rain water harvesting may be completely utilized by enhancing the capacity of the existing system
- Solar power generation and usage may be enhanced

It is hoped that the results presented in this audit will serve as a guide for educating the college community on the existing environment related practices and resource usage at the college as well as spawn new initiatives and innovative practices.

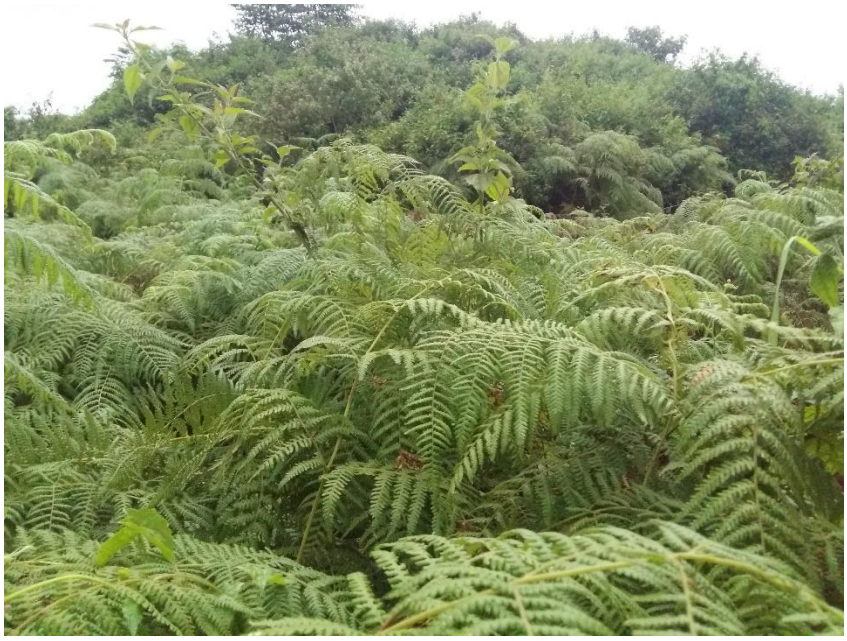
Josily Cyriac
Coordinator, IQAC

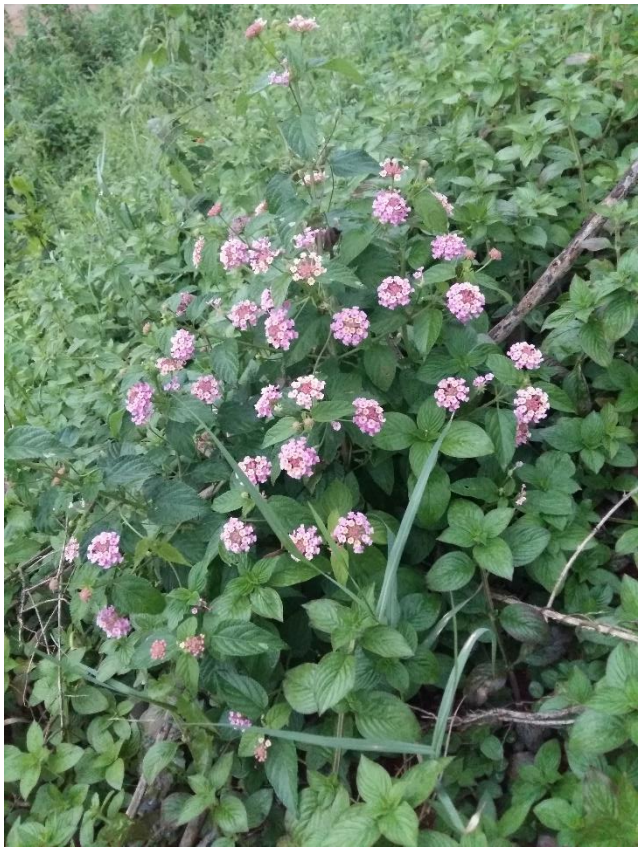
Dr. Suma K K
Principal



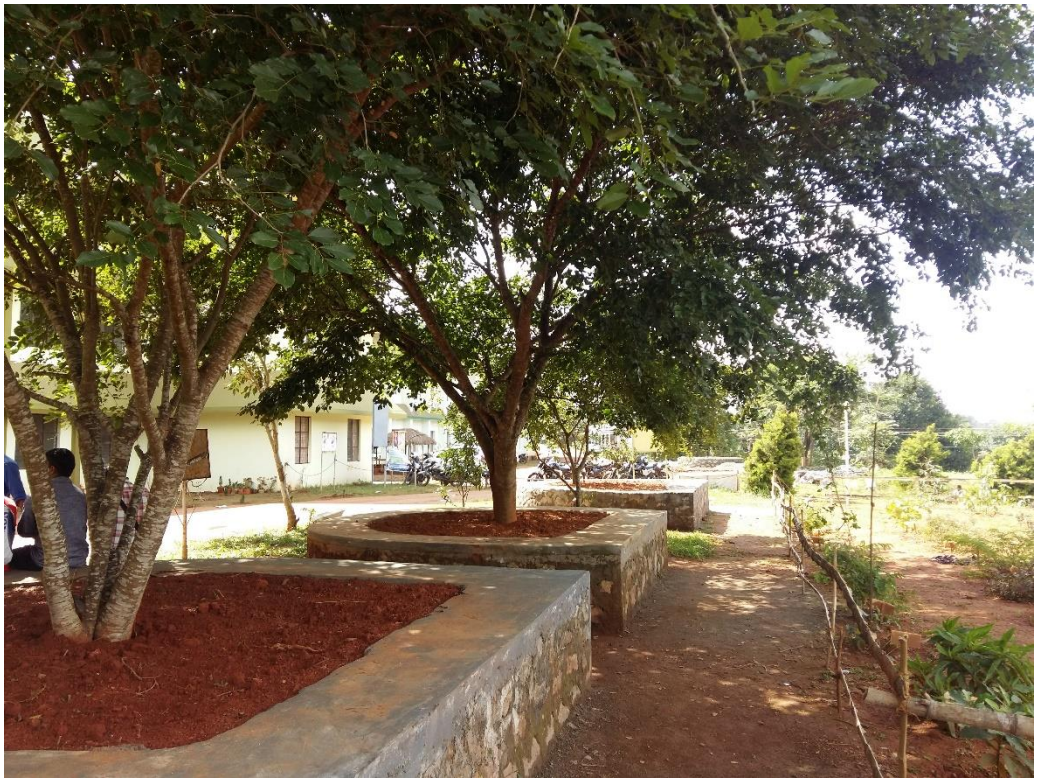
Herbal garden

Vegetable garden

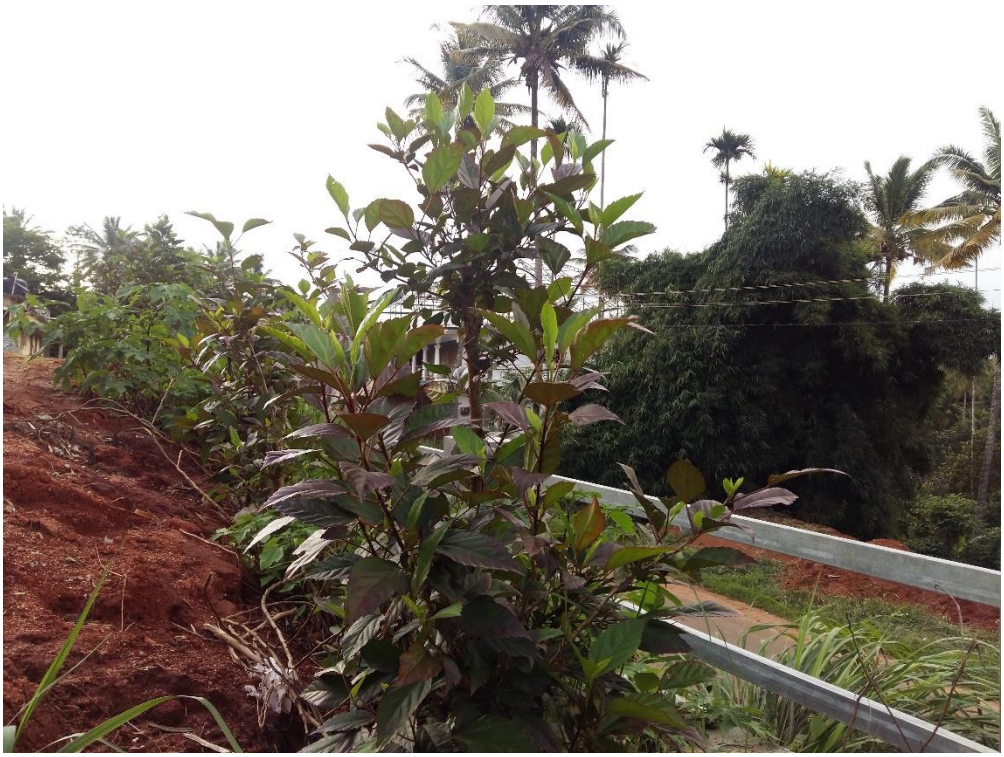




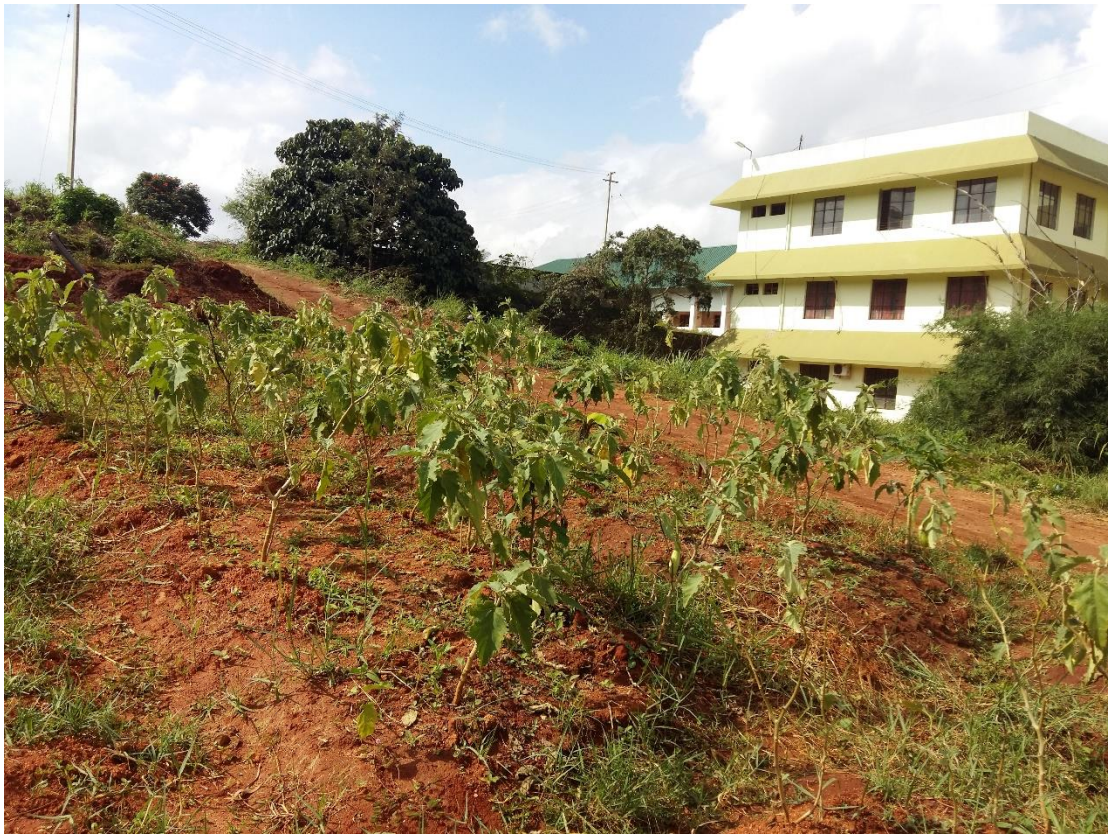
Indigenous flora of the campus

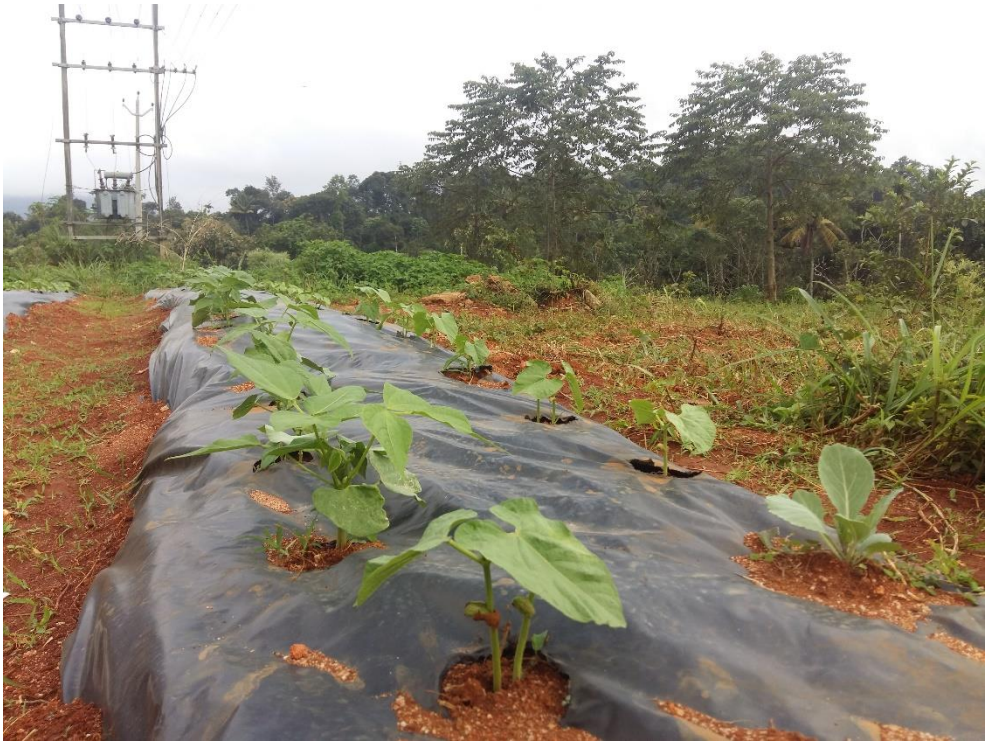


Trees planted in the campus

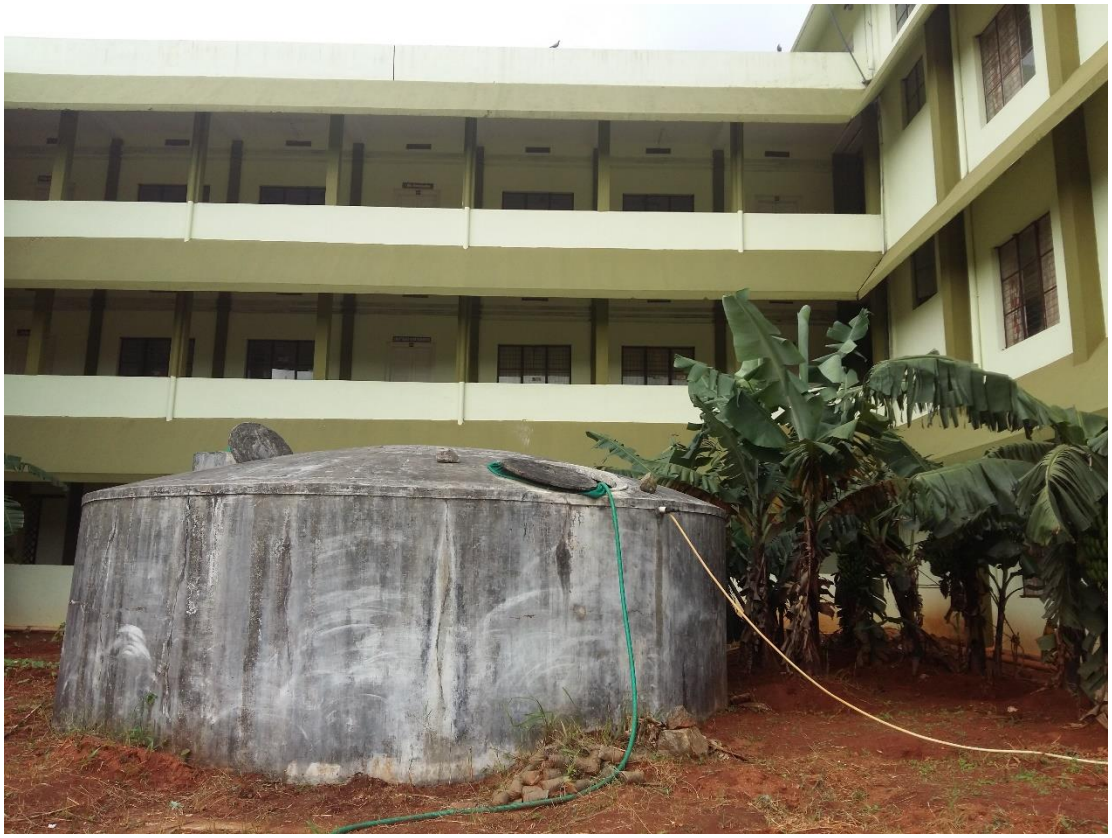


Bio fence





Organic farming



Rain water harvesting system