TKM College of Arts and Science, Kollam

October 2021

GREEN AND ENVIRONMENT AUDIT REPORT

Prepared by IQAC, TKMCAS

1. Introduction

Inculcation of green values to generations is a demanding need today as the environment is becoming fragile and environmental calamities are upcoming. Realizing this fact, for spreading the message and to determine where we are in terms of practicing green initiatives, an attempt to assess some of the thrust areas of green audit with the cooperation of students. As the present generation goes much indolent about the conservation of nature and energy resources, it is essential to build awareness and concern for Nature and its resources, so that the message of conservation can be passed on to the future generations. Being the nursery of awareness and responsibilities, a college can greatly deal with this issue. As part of the self-assessment of the status of the institute in the matter of conservation of nature and energy, a Green Audit can serve as a better tool. The audit will help find out the loop holes and thereby resolve the issues by taking necessary steps. Hope this venture could spread light on the consciousness of teachers, students and public for uplifting the values of conservation and sustainable development and spreading the message.

2. About the College

T.K.M. College of Arts and Science was founded by Late Janab.Thangal Kunju Musaliar in 1965. Right from its inception, T.K.M. College of Arts and Science has aimed at serving the socially and economically disadvantaged sections of the society, with special focus on the region in which it is located. For half a century the institution rendered glorious service

producing brilliant alumni who found positions of eminence in the worlds of business and industry, government service and private enterprise all over the globe.

College has a glorious history of 50 years of academic opulence. The college celebrated its Golden Jubilee in a befitted manner in 2015-16. The highlights of the celebrations were the National Scientific and Cultural Expo the like of which the city of Kollam had never seen before, international conferences, seminars and workshops, visits of eminent personalities in and outside the community including Nobel Laureate Ei-chi-Negichi, the writer Jaisree Mishra and Padma Sree Thanu Padmanabhan, the Golden Jubilee Lecture series, medical camps, adoption of cancer patients, erection of the golden jubilee gate, gifting of houses to the homeless.

Today, T.K.M. College of Arts and Science is a leading arts and science institution in Kerala reaccredited by the NAAC with A grade, offering 10 degree and 6 PG courses, catering to the needs of students, 75% of which are girls and 60% of which come from SC/ST/OBC categories. The college ensures that about 70% of its students receive scholarships from one source or another. Three of the departments of the college are reorganized Research Centres of the University of Kerala. The departments of Physics, Chemistry and Mathematics are funded by the Department of Science and Technology (DST), Government of India under the FIST scheme. The college was recently ranked 45th in the country by the NIRF, MHRD, Government of India.

3. Strategic plan adopted

Physical data was collected with the help of technicians by physical inspection of the campus. The floral and faunal data was collected with the help of teachers and students of department of

botany and zoology. The data was reviewed and the report was prepared. The audit was carried for the areas of water usage, energy usage, flora and fauna and solid waste management.

1. Maximize the proportion of waste that is recycled & minimize the quantity of non-recyclable refuse: Yes

a) Reduce the absolute amount of waste that it produces from college kitchens, buttery, staff offices and student accommodation: Yes

b) Make full use of all recycling facilities provided by City Municipality and private suppliers, including glass, cans, white, colour and brown paper, plastic bottles, batteries, print cartridges, cardboard and furniture: Yes

c) Compost, or cause to be composted, all organic waste, green waste and un-recycled cardboard produced in or collected from kitchens, gardens, offices, and rooms: No

d) Recycle or safely dispose of white goods, computers, and electrical appliances: Yes

e) Use reusable resources and containers and avoid unnecessary packaging where possible: Yes

f) Always purchase recycled resources where these are both suitable and available: Yes

g) Provide sufficient, accessible, and well-publicized collection points for recyclable waste, with responsibility for recycling clearly allocated: Yes

h) Make specific arrangements for events, such as cultural Events, internal and external seminars, and conferences, where significant recyclable waste is likely to be produced, to both minimize the waste produced and maximize what is recycled/reused: Yes

i) Promote reuse of items and waste recycling among staff, students and conference guests through training, posters, and incentives: Yes

j) Dispose all waste, whether solid or otherwise, in a scientific manner and ensure that it is not released directly to the environment: Yes

- **<u>Solid waste management of the campus</u>**

Upon audit the major solid wastes were identified as fallen leaves and degradable lunch wastes (wasted food). We have a pit for biomanuring of the bio-wastes behind our auditorium. We use it on a routine basis. But recently as an initiative for reducing the accumulated bio-wastes, we have started to advice the students to bring food items only in required quantity which is found to be very much effective. Regarding sewage wastes, we have septic tanks. Thus, the waste generated in the campus is very well managed.

- **Abandoning disposable plastic wastes**

  Plastics though a wonder of the century is a menace causing environmental issues. As degradation is very slow and non-biodegradable, the disposable plastics are banned in the campus. More over the students are advised to bring their lunch in steel containers for reducing the non-degradable waste in the campus.

- Wastes are collected using suitable dustbins according to their degrading nature
- It is a Green Campus so that necessary waste collection bins are placed for events, such as cultural Events, internal and external seminars, and conferences
- We are used eco-friendly products.
- **Ecofriendly green initiatives in the campus**
- Use of reusable steel utensils and tumblers
- As a green culture, for every function in the campus including council meeting and PTA, steel tumblers were used. By this practice accumulation of nondegradable wastes in the campus is reduced to great extent.

2. Reduce energy consumption, especially of energy derived from fossil fuels

a) Support renewable and carbon-neutral electricity options on any energy-purchasing consortium, with the aim of supplying all college properties with electricity that can be attributed to renewable and carbon-neutral sources: Yes

b) Appreciate that it is preferable to purchase electricity from a company that invests in new sources of renewable and carbon-neutral electricity: Yes

c) Look in to the possibility of on-site micro-generation of renewable electricity: Yes

d) Give preference to the most energy efficient and environmentally sound appliances available, this includes only using energy-saving light bulbs: Yes

e) Provide energy efficient heating systems, with adjustable controls for individual heating appliances wherever possible, and ensure that comprehensible instructions are available to staff and students on the use of heating controls: Yes

f) Encourage staff, students, and conference guests to save energy through visible reminders, incentives, and information to increase awareness. This particularly concerns turning off electrical appliances when not in use in both communal and residential rooms: Yes

g) Monitor and understand the importance of different sources of college energy consumption, and set appropriate and measurable targets for a reduction in certain areas of consumption and/or in the overall consumption of energy: Yes

h) Conduct switch off drills at regular intervals: Yes

i) Ensures that all electronic and electrical equipment's, such as computers, are switched off when not in use, and is generally configured in power saving mode when such option is available: Yes

j) If there are equipment's running on standby mode, reduce the energy consumption on standby mode or minimize the running of equipment's on standby mode: Yes

- **Energy usage and management**

As non-renewable energy resources are depleting, energy management strategies are very much required for sustainability of the campus. For reducing the use of electricity in the campus during on and off hours, maximum no of led bulbs and led tube lights are used. As the campus is located in rural area, the student in majority use public transport and hence reduces use of natural fuel and carbon emissions. Majority of the teacher are using pooled cars or public transport facility for their journey to college.

Table I LED usage in the campus

Location	Number of LED	Hour of usage	Energy utilization in watts
Office	10	8	400
Class rooms	80	5	2000
Computer lab	18	8	720
Department labs	40	8	1600
Conference Hall	8	8	320
Seminar Hall	8	5	200
Gym	4	3	60
Canteen	4	10	200
Society office	8	5	200
Library	40	8	3200
Toilet	7	2	70
Waiting Area	15	6	450
Auditorium	6	5	750
Open Campus	6	7	1050
Principal room	6	8	240
Gate	4	8	800
Corridor (3 Floor)	40	8	1600

Total	**304**	**112**	**13860**

Table II Showing usages of electricity by various departments

Department	Energy used in watts
Mathematics	2500
Physics	2260
Chemistry	1320
English	340
Commerce	1660
Biochemistry	1220
Botany	2460
Zoology	780
Islamic History	140

Table III Department wise list of teacher using motor cars

Department	No of teachers using motor cars
Mathematics	Nil
Physics	2
Chemistry	3
English	3
Commerce	4
Biochemistry	1

Botany	Nil
Zoology	Nil

- **Use of water and management**

Water is the essence of life. The predicted world war is for water. We are experiencing water shortage day to day. The methods like rain water harvesting, optimum usage, limited wastage and recycling of used water for purpose other than drinking are suitable management practices to tackle the issue. Our campus is self-sufficient in terms of water due to better management practices. We recommend and advertise limited use of water. The used and spent water is recycled, collected in tanks and used for gardening purpose. The campus is so maintain to hold maximum water and there is no outflow of rainwater from the campus. Due to this, the wells within the campus are sufficient in water even in summer season.

Table IV Showing water usage and management strategies used in the campus

Department	**Optimized use of water**	**Water purifier**	**Water coolers**	**Waste water via leakage**	**Use of recycled water**
Mathematics		Central	Common	.	.

Physics		facility connected to bore well	facility in the ladies waiting area and the down floor of the college	.	.
Chemistry				.	.
English				.	.
Commerce				.	.
Biochemistry				.	.
Botany				.	.
Zoology				.	.
Garden				.	

- **Planting more trees for greening the campus**

Due to constant efforts of NSS, Nature Club and Environmental Club, extensive tree planting drive is initiated in the campus. Hence a thick green canopy is extensively present in the campus. For improving the aesthetic value, a lawn with topiaries is maintained in front of the Chamber of Principal. The insitu conserved biodiversity area is having rich plantation and allowed to grow without pruning. Overall the canopy of the campus serves as a mechanism for supply of ample amount of oxygen and utilization of carbon dioxide by carbon fixation.

3. Ensure that improvements, purchases, and developments are environmentally sound

a) Seek and act upon professional advice in order to minimize the adverse environmental impact of any new developments and exceed government regulatory requirements. This includes efficient heating and water systems, appropriate space for recycling, and the use of recycled and/or sustainable building materials where possible.

b) Purchase efficient and environmentally sound appliances in order to fulfil the commitments in section 2, and consider replacing old stock with 'greener', more efficient alternatives.

c) Purchase food that has been produced and delivered with minimal impact on the environment, this includes buying locally produced, organic and free-range food wherever possible.

4. Minimize the use of unsustainable transport

a) Make available information about bicycle and pedestrian routes, public transport services and car share schemes to staff and students: Yes

b) Reduce the proportion of travel on College business carried out in private transport and eliminate unnecessary and inefficient use of college vehicles: Yes

c) Promote car sharing / car pool among the students and faculty members.

5. Minimize consumption of water

a) Repair sources of water leakage, such as dripping taps and showers as quickly as possible.
b) Install appliances which reduce water consumption.

c) Encourage a decrease in water usage among staff, students, and conference guests.

d) Purchase the most efficient washing machines and dishwashers available which have an economy setting as default.

e) Use an efficient and hygienic water storage mechanism is to minimize the loss of water during storage.

f) Minimize wastage of water and use of electricity during water filtration process, if used, such as RO filtration process and ensure that the equipment's used for such usage, are regularly serviced, and the wastage of water is not below the industry average for such equipment's used in similar capacity.

g) Install Water recycling mechanism, such as rain water harvesting system.

- Our campus is self-sufficient in terms of water due to better management practices.
- We recommend and advertise limited use of water. The used and spent water is recycled, collected in tanks, and used for gardening purpose.
- The campus is so maintaining to hold maximum water and there is no outflow of rainwater from the campus. Due to this, the wells within the campus are sufficient in water even in summer season.

6. Minimize the use of chemical pollutants

a) Ensure that all cleaning products used by college staff have a minimal detrimental impact on the environment, i.e. are biodegradable and non-toxic, even where this exceeds the Control of Substances Hazardous to Health (COSHH) regulations.
b) Minimize the use of fertilizers and pesticides in college grounds, opting for the use of compost produced on site wherever possible.
c) Dispose the chemical waste generated from the laboratories in a scientific manner.
d) Reduce the practice of burning plastic and other material that emits harmful gas on burning is prevented in the campus.
e) Establish a Garden in the campus.
f) Encourage the faculties and students to plant trees in the garden.
g) Reviews periodically the list of trees planted in the garden.

7. Ensure that environmental awareness is created

a) Conduct environmental awareness workshops as a part of the program.
b) Conduct events such as plant trees to spread environmental awareness among the students.
c) Create awareness of environmental sustainability and takes actions to ensure environmental sustainability.
d) Reduce the rate at which the College contributes to the depletion and degradation of natural resources.
e) Promote environmental awareness as a part of course work in various curricular areas, independent research projects, and community service.

8. Ensure that the Environmental Policy is enacted, enforced, and reviewed

a) Review architecture of existing buildings and reviews ways, in consultation with experts, to reduce usage of energy for such buildings, offering greatest efficiency for energy and water usage, and reducing carbon emission.
b) Establish a College Environmental Committee that will hold responsibility for the enactment, enforcement, and review of the Environmental Policy. The Environmental Committee shall be the source of advice and guidance to staff and students on how to implement this Policy.
c) Ensure that on the Nature Club there will be appropriate representatives of the relevant college departments and authorities – such as catering, gardening, maintenance, cleaning, and finance.
d) Ensure that on the Environmental Committee there will be the Green Officer from an external agency who is engaged in the profession of providing guidance on environmental impact.
e) Ensure that the Environmental Committee will review the Environmental Policy on an annual basis, and will monitor progress and set measurable targets wherever possible.

f) Ensure that the Environmental Policy is enforced regardless of whether its requirements exceed the mandate of the law.
g) Require that every staff and student member recognizes their responsibility to ensure that the commitments in the Environmental Policy are properly put into practice.
h) Ensure that an audit is conducted annually and action is taken on the basis of audit report, recommendation, and findings.

PART B

Background

The audit focus is to survey the college grounds to assess the level of biodiversity of flora and fauna found within the college. Biodiversity is the web of life. There are a variety of living things that are found within the college coexisting with the activities of students and teachers. These include the trees, shrubs, smaller plants, and grasses, as well as birds, mammals, and small invertebrates such as spiders and insects. The aim is to quantify the area of the college covered by vegetation and to assess the amount and diversity of habitats which could support a variety of species. Inorder to increase biodiversity in the college campus students had achieved by planting or seeding with native tree and shrub species.

Table 1. Habitat Health Observation Survey

Map Reference	Plants													
	Layers			Natives			Weeds			Area				Comments/Rating
	Herbs	Shrubs	Trees	None	Few	Most	Most	None	Some	Lots	Small	Medium	Large	
Grassland-	03	11	58		33			0						
Garden Beds-	04	05	0		04									

Table 2. Tree survey

0	Species	Tally (i.e., Number of Trees)	Total Number
Native / Alive without hollows	1. *Artocarpus heterophyllus* 2. *Bergera koenigii (Murraya koenigii)* 3. *Calotropis gigantia* 4. *Cassia fistula* 5. *Citrus limon* 6. *Crataeva magna* 7. *Cycas circinalis* 8. *Ficus benjamina* 9. *Flacourtia jangomas* 10. *Hydnocarpus alpine* 11. *Ixora coccinia* 12. *Leucaena leucocephala* 13. *Macaranga peltata* 14. *Phyllanthus emblica* 15. *Santalum album* 16. *Spondias mangifera* 17. *Tectona grandis* 18. *Thespesia populnea* 19. *Vinca rosea*	5 3 1 3 1 1 3 4 1 1 15 3 1 3 1 1 2 1 2	52
Native / Alive with hollows	*0*	0	0
Native / Dead without hollows	0	0	0
Native / Dead with hollows	0	0	0
Exotic / Alive without hollows	1. *Agave americana* 2. *Albizia saman* 3. *Allamanda cathartica* 4. *Alstonia scholaris* 5. *Annona squamosa*	1 3 3 2 1 1	100

	6. *Araucaria columnaris* 7. *Azadirachta indica* 8. *Bambusa bambos* 9. *Bambusa vulgaris* 10. *Bauhinia acuminata* 11. *Bauhinia variegata* 12. *Bridelia retusa* 13. *Callistemon lanceolatus* 14. *Cosmos sulphureus* 15. *Costus speciosus* 16. *Couroupita guianensis* 17. *Crinum asiaticum* 18. *Cyrtostachys renda* 19. *Delonix regia* 20. *Ficus auriculata* 21. *Hamelia patens* 22. *Helicteres isora* 23. *Magnolia champaca* 24. *Manilkara sapota (Achrus sapota)* 25. *Murraya exotica* 26. *Musa paradisica* 27. *Nerium oleander* 28. *Ochna integerrima* 29. *Passiflora edulis* 30. *Peltophorum pterocarpum* 31. *Piper longum* 32. *Plumbago auriculata* 33. *Psidium guajava* 34. *Saraca asoca* 35. *Simarouba glauca* 36. *Syzgium samarangense* 37. *Vitex negundo*	12 3 2 1 1 1 2 2 2 1 2 5 1 1 1 1 1 1 1 5 1 1 18 6 2 10 2 1 1 1 1	
Exotic / Alive with hollows	1. *Caesalpinia coriaria* 2. *Chrysophyllum cainito* 3. *Cocos nucifera* 4. *Hibiscus rosa-sinensis* 5. *Kleinhovia hospital* 6. *Nerium oleander* 7. *Swietenia macrophylla*	1 2 9 6 1 1 8	28
Exotic / Dead without hollows	1. *Passiflora edulis*	1	1

Exotic / Dead with hollows	0	0	0

Table V List of plants in the campus with botanical names and family

	BOTANICAL NAME	**FAMILY**	**COMMON NAME**	**HABIT**	**Native /Non-Native**
1	*Agave americana*	Agavaceae	Aanakaitha	Shrub	Exotic
2	*Albizia saman*	Mimosoideae	Mazhamaram	Tree	Exotic
3	*Allamanda cathartica*	Apocynaceae	Kolambi	Shrub	Exotic
4	*Alstonia scholaris*	Apocynaceae	Ezhilampala	Tree	Exotic
5	*Annona squamosa*	Annonaceae	Custard apple	Small Tree	Exotic
6	*Araucaria columnaris*	Araucariaceae	Christmas tree	Tree	Exotic
7	*Artocarpus heterophyllus*	Moraceae	Plavu	Tree	Native
8	*Azadirachta indica*	Meliaceae	Veppu	Tree	Exotic
9	*Bambusa bambos*	Poaceae	Illimula	Tree	Exotic
10	*Bambusa vulgaris*	Poaceae	Mula	Tree	Exotic
11	*Bauhinia acuminata*	Caesalpinioideae	Vella mandaram	Tree	Exotic
12	*Bauhinia variegata*	Caesalpinioideae	Mandaram	Tree	Exotic
13	*Bergera koenigii (Murraya koenigii)*	Rutaceae	Kariveppu	Small tree	Native
14	*Bridelia retusa*	Phyllanthaceae	Mulluvenga	Tree	Exotic
15	*Caesalpinia coriaria*	Caesalpinioideae	Dividivi	Tree	Exotic
16	*Callistemon lanceolatus*	Myrtaceae	Bottle brush	Small tree	Exotic
17	*Calotropis gigantia*	Asclepiadaceae	Eruk	Shrub	Native
18	*Cassia fistula*	Caesalpinioideae	Kanikonna	Tree	Native
19	*Chrysophyllum cainito*	Sapotaceae	Star apple	Tree	Exotic
20	*Citrus limon*	Rutaceae	Naaragam	Tree	Native
21	*Cocos nucifera*	Aracaceae	Thengu	Tree	Exotic

22	*Cosmos sulphureus*	Asteracae	Theepori	Shrub	Exotic
23	*Costus speciosus*	Zingiberaceae	Aanakoova	Shrub	Exotic
24	*Couroupita guianensis*	Lecythidaceae	Nagalingamaram	Tree	Exotic
25	*Crataeva magna*	Capparaceae	Neermathalam	Tree	Native
26	*Crinum asiaticum*	Amaryllidaceae	Spider lilly	Sub shrub	Exotic
27	*Cycas circinalis*	Cycadaceae	Chana	Small tree	Native
28	*Cyrtostachys renda*	Aracaceae	Lipstick palm	Small tree	Exotic
29	*Delonix regia*	Caesalpinioideae	Vaga	Tree	Exotic
30	*Ficus auriculata*	Moraceae	Athi	Tree	Exotic
31	*Ficus benjamina*	Moraceae	Vellal	Tree	Native
32	*Flacourtia jangomas*	Facourtiaceae	Lavalolikka	Tree	Native
33	*Hamelia patens*	Rubiaceae		Small tree	Exotic
34	*Helicteres isora*	Stericulaceae	Valampiri	Tree	Exotic
35	*Hibiscus rosa-sinensis*	Malvaceae	Chemparathi	Shrub	Exotic
36	*Hydnocarpus alpine*	Flacourtiaceae	Marotti	Tree	Native
37	*Ixora coccinia*	Rubiaceae	Thetti	Shrub	Native
38	*Kleinhovia hospital*	Stericulaceae	Guest tree	Tree	Exotic
39	*Leucaena leucocephala*	Mimosoideae	Subabul	Small tree	Native
40	*Macaranga peltata*	Euphorbiacaeae	Vatta	Shrub	Native
41	*Magnolia champaca*	Magnoliaceae	Champakam	Tree	Exotic
42	*Mangifera indica*	Anacardiaceae	Mavu	Tree	Native
43	*Manilkara sapota (Achrus sapota)*	Sapotaceae	Chikku	Tree	Exotic
44	*Murraya exotica*	Rutaceae	Maramulla	Small tree	Exotic
45	*Musa paradisica*	Musacaeae	Vazha	Shrub	Exotic
46	*Nerium oleander*	Apocynaceae	Aruli	Shrub	Exotic
47	*Ochna integerrima*	Ochnaceae	Mickey mouse plant	Small tree	Exotic
48	*Passiflora edulis*	Passifloraceae	Passion fruit	Climber	Exotic
50	*Peltophorum pterocarpum*	Caesalpinioideae	Charakonna	Tree	Exotic
51	*Phyllanthus emblica*	Phyllanthaceae	Nelli	Tree	Native
52	*Piper longum*	Piperaceae	Thippalli	Herb	Exotic
53	*Plumbago auriculata*	Plumbaginaceae	Neelakoduveli	Herb	Exotic
54	*Psidium guajava*	Myrtaceae	Pera	Tree	Exotic
55	*Santalum album*	Santalacaeae	Chandanam	Tree	Native
56	*Saraca asoca*	Caesalpinioideae	Asokam	Tree	Exotic
57	*Simarouba glauca*	Simaroubaceae	Lakshmitharu	Tree	Exotic
58	*Spondias mangifera*	Anacardiaceae	Ambazham	Tree	Native
59	*Swietenia macrophylla*	Meliaceae	Mahagony	Tree	Exotic
60	*Syzgium samarangense*	Myrtaceae	Jamba	Tree	Exotic
61	*Tectona grandis*	Verbenaceae	Thekku	Tree	Native
62	*Thespesia populnea*	Malvaceae	Poovarash	Tree	Native
63	*Vinca rosea*	Apocynaceae	Shavamnari	Herb	Native
64	*Vitex negundo*	Verbenaceae	Karinochi	Small tree	Exotic

Table VI Location wise distribution of plants

	Botanical name	Front view	Car parking Area	Insitu conserved area
1	*Agave americana*			1
2	*Albizia saman*	2	1	
3	*Allamanda cathartica*	3		
4	*Alstonia scholaris*		2	
5	*Annona squamosa*	1		
6	*Araucaria columnaris*		1	
7	*Artocarpus heterophyllus*	5		
8	*Azadirachta indica*	8	4	
9	*Bambusa bambos*	2	1	3
10	*Bambusa vulgaris*	2		
11	*Bauhinia acuminata*	1		
12	*Bauhinia variegata*	1		
13	*Bergera koenigii (Murraya koenigii)*	3		
14	*Bridelia retusa*	1		
15	*Caesalpinia coriaria*			1
16	*Callistemon lanceolatus*			2
17	*Calotropis gigantia*	1		
18	*Cassia fistula*	3	1	
19	*Chrysophyllum cainito*		2	
20	*Citrus limon*	1		
21	*Cocos nucifera*	7	1	1
22	*Cosmos sulphureus*	2		
23	*Costus speciosus*	1		1
24	*Couroupita guianensis*	1		
25	*Crataeva magna*	1		
26	*Crinum asiaticum*	2		
27	*Cycas circinalis*			3
28	*Cyrtostachys renda*	5		
29	*Delonix regia*	1		
30	*Ficus auriculata*			1
31	*Ficus benjamina*	4		
32	*Flacourtia jangomas*	1		
33	*Hamelia patens*			1
34	*Helicteres isora*	1		
35	*Hibiscus rosa-sinensis*	5		1
36	*Hydnocarpus alpine*	1		
37	*Ixora coccinia*	15		

38	*Kleinhovia hospital*	1		
39	*Leucaena leucocephala*	3		5
40	*Macaranga peltata*	1		
41	*Magnolia champaca*	1		
42	*Mangifera indica*	9	1	
43	*Manilkara sapota (Achrus sapota)*	1		
44	*Murraya exotica*			1
45	*Musa paradisica*	3	2	
46	*Nerium oleander*			1
47	*Ochna integerrima*	1		
48	*Passiflora edulis*	1		
50	*Peltophorum pterocarpum*	18		
51	*Phyllanthus emblica*	3	1	
52	*Piper longum*			6
53	*Plumbago auriculata*	2		
54	*Psidium guajava*	5	5	
55	*Santalum album*			1
56	*Saraca asoca*			2
57	*Simarouba glauca*	1		
58	*Spondias mangifera*	1		
59	*Swietenia macrophylla*	7	1	
60	*Syzgium samarangense*	1		
61	*Tectona grandis*		2	
62	*Thespesia populnea*		1	
63	*Vinca rosea*	2		
64	*Vitex negundo*			1

Table VI Medicinal Value of the plants

	BOTANICAL NAME	**Use of the plant**
1	*Agave americana*	Ornamental
2	*Albizia saman*	Ornamental
3	*Allamanda cathartica*	Ornamental
4	*Alstonia scholaris*	Medicinal
5	*Annona squamosa*	Orchard
6	*Araucaria columnaris*	Ornamental
7	*Artocarpus heterophyllus*	Orchard
8	*Azadirachta indica*	Medicinal
9	*Bambusa bambos*	Ornamental

10	*Bambusa vulgaris*	Ornamental/wood
11	*Bauhinia acuminata*	Ornamental
12	*Bauhinia variegata*	Ornamental
13	*Bergera koenigii (Murraya koenigii)*	Medicinal
14	*Bridelia retusa*	Ornamental
15	*Caesalpinia coriaria*	Ornamental
16	*Callistemon lanceolatus*	Ornamental
17	*Calotropis gigantia*	Ornamental
18	*Cassia fistula*	Ornamental
19	*Chrysophyllum cainito*	Ornamental
20	*Citrus limon*	Medicinal/orchard
21	*Cocos nucifera*	Orchard
22	*Cosmos sulphureus*	Ornamental
23	*Costus speciosus*	Ornamental
24	*Couroupita guianensis*	Ornamental
25	*Crataeva magna*	Ornamental
26	*Crinum asiaticum*	Ornamental
27	*Cycas circinalis*	Ornamental
28	*Cyrtostachys renda*	Ornamental
29	*Delonix regia*	Ornamental
30	*Ficus auriculata*	Ornamental
31	*Ficus benjamina*	Ornamental
32	*Flacourtia jangomas*	Orchard
33	*Hamelia patens*	Ornamental
34	*Helicteres isora*	Medicinal
35	*Hibiscus rosa-sinensis*	Medicinal/ornamental
36	*Hydnocarpus alpine*	Medicinal/ritual
37	*Ixora coccinia*	Medicinal/ornamental
38	*Kleinhovia hospital*	Ornamental
39	*Leucaena leucocephala*	Ornamental
40	*Macaranga peltata*	Soft wood
41	*Magnolia champaca*	Ornamental
42	*Mangifera indica*	Medicinal /orchard
43	*Manilkara sapota (Achrus sapota)*	Orchard
44	*Murraya exotica*	Ornamental
45	*Musa paradisica*	Orchard
46	*Nerium oleander*	Ornamental
47	*Ochna integerrima*	Ornamental
48	*Passiflora edulis*	Orchard
50	*Peltophorum pterocarpum*	Ornamental
51	*Phyllanthus emblica*	Medicinal /orchard
52	*Piper longum*	Medicinal

53	*Plumbago auriculata*	Medicinal
54	*Psidium guajava*	Medicinal /orchard
55	*Santalum album*	Medicinal/wood
56	*Saraca asoca*	Medicinal/ornamental
57	*Simarouba glauca*	Medicinal
58	*Spondias mangifera*	Orchard
59	*Swietenia macrophylla*	Wood
60	*Syzgium samarangense*	Orchard
61	*Tectona grandis*	Wood
62	*Thespesia populnea*	Wood
63	*Vinca rosea*	Medicinal/ornamental
64	*Vitex negundo*	Medicinal/ornamental

Representative flora of the campus

Agave americana

Crinum asiaticum

Mangiferaindica

Spondias mangifera

Annona squamosa

IV Fauna of the campus.

As fauna are essential part of an ecosystem as consumers of trophic levels, their maintenance in an ecosystem is very much essential. Hence an attempt was carried out to identify common insects and frequently visiting birds in and around the campus.

Table 3. College grounds vertebrate animal observation survey

Mammal Species	Evidence * (Yes/No)	Tally	Status N=Native I=Introduced	Behavior / Habitat Notes (e.g., sleeping, calling, hiding, hunting, perching, etc.)

1.	Cats - *Felis catus*	Yes (D)	4	Native	Walking
2.	Squirrel - *Sciuridae*	Yes (D)	3	Native	Calling
3.	Rats – *Rattus*	Yes (E)	13	Native	Hiding
4.	Mongoose - *Urva edwardsii*	Yes (E)	7	Native	Moving

	Reptile Species	**Evidence ***	**Tally**	**Status N=Native I=Introduced**	**Behaviour / Habitat Notes (e.g., feeding, resting, aggressive, molting, hiding, moving, swimming, mating, etc.)**
1.	Lizard - *Hemidactylus frenatus*	Yes (D)	31	Native	Moving
2.	Snake – *Ptyas mucose*	Yes (E)	03	Native	Hiding
3.	Calottes calotes	Yes (D)	06	Native	Resting
4.	Snake – *Viper Daboia russelii*	Yes (E)	02	Native	Hiding
5.	Snake - Naja naja	Yes (E)	02	Native	Hiding
	Amphibian Species	**Evidence***	**Tally**	**Status N=Native I=Introduced**	**Behavior / Habitat Notes (e.g., feeding, nesting, aggressive, hiding, moving, calling, perching)**
1.	Frogs	Yes (D)	14	Native	Moving
2.	Toads - *Duttaphrynus beddomii*	Yes(D)	06	Native	Moving

Arthropods	**Evidence* (Yes/No)**	**Tally**	**Status N=Native I=Introduced**	**Behavior / Habitat Notes**
1. Bianor sp. *2. Epeus sp.* *3. Hyllus semicupreus Simon 1885* *4. Hyllus sp.* *5. Phaeacius sp.*	Yes	1 1 1 1 1 2	N Inroduced I I I I	Feeding
6. Tirumala	Yes	1	Native	Feeding

septentrionisdravidarumDakhan 7. *Pachliopta hector* 8. *Jamidescelenoblairana* 9. *Jamidescelenoceleno* 10. *Catopsiliapomona (Fabricius, 1775)* 11. *Euthaliaaconthea (Cramer, 1777)* 12. *Hypolimnasbolina (Linnaeus, 1758)* 13. *Hypolimnasmisippus (Linnaeus, 1764)* 14. *Neopithecopszalmora (Butler 1870)* 15. *Danausgenutia Cramer.* 16. *Psyche Leptosianina (Fabricius, 1793)*		1 1 1 1 1 1 1 1 1 1 1		

	Avian Species	Evidence*	Tally	Status N=Native I=Introduced	Behavior / Habitat Notes (e.g., feeding, nesting, aggressive, hiding, moving, calling, perching)
.	1. *Ardea intermedia*	Direct observing	1	NATIVE	Perching
	2. *Ardeola grayii*		2	NATIVE	Moving
	3. *Egretta garzetta*		1	NATIVE	Feeding
	4. *Ardea cinerea*		2	NATIVE	Perching
	5. *Himantopus himantopus*		1	INTRODUCED	Moving
	6. *Tringa nebularia*		1	INTRODUCED	Feeding
	7. *Vanellus indicus*		1	INTRODUCED	Perching
	8. *Ciconia episcopus*		1	INTRODUCED	Moving
	9. *Anastomus oscitans*		1	NATIVE	Moving
	10. *Amaurornis phoenicurus*		1	NATIVE	Feeding
	11. *Centropus Sinensis*		2	NATIVE	Moving
	12. *Eudynamys scolopaceus*		1	INTRODUCED	Feeding
	13. *Milvus migrans*		4	NATIVE	Moving
	14. *Haliastur indus*		1	NATIVE	Feeding
	15. *Halcyon smyrnensis*		1	NATIVE	Moving
	16. *Merops philippinus*		1	INTRODUCED	Feeding
	17. *Dinopium javanense*		1	NATIVE	Moving
	18. *Megalaima viridis*		2	NATIVE	Feeding
	19. *Phalacrocorax*		2		

	fuscicollis		4	NATIVE	
	20. *Psittacula krameri*		2	NATIVE	Perching
	21. *Columba livia*		1	NATIVE	Perching
	22. *Athene brama*		4	NATIVE	Perching
	23. *Pitta brachyura*		2	INTRODUCED	Moving
	24. *Dicrurus macrocercus*		1	NATIVE	Feeding
	25. *Oriolus oriolus*		1	INTRODUCED	Perching
	26. *Copsychus saularis*		1	NATIVE	Moving
	27. *Dendrocitta vagabunda*		1	NATIVE	Feeding
	28. *Corvus splendens*		1	NATIVE	Perching
	29. *Corvus macrorhynchos*		1	NATIVE	Moving
	30. *Turdoides leucocephala*		2	NATIVE	Feeding
	31. *Lonchura striata*		2	NATIVE	Perching
	32. *Nectarinia (Cinnyris) asiatica*		1	NATIVE	Moving
	33. *Pycnonotus jocosus*		1	NATIVE	Feeding
	34. *Terpsiphone paradisi*		1	NATIVE	
	35. *Acridotheres tristis*		5	NATIVE	Perching
	36. *Acridotheres fuscus*				

 ***Hemidactylus frenatus***	 *Hemidactylus frenatus*
 *Urva edwardsii*	 ***Rattus***
 *Sciuridae*	 *Calotes calotes*

Duttaphrynus beddomii

Ptyas mucosa

Daboia russelii

Naja naja

Median egret *Ardea intermedia* ചെറുമുണ്ടി	
Indian Pond Heron *Ardeola grayii* കുളക്കൊക്ക്	
Little Egret *Egretta garzetta* ചിന്നമുണ്ടി	

Oriental white ibis *Threskiornis melanocephalus* അരിവാൾ കൊക്കൻ	

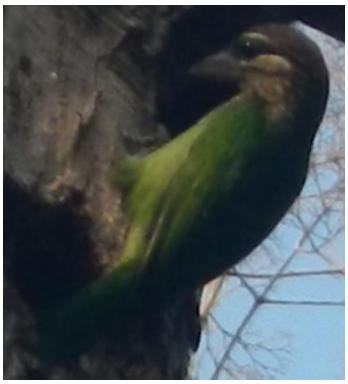
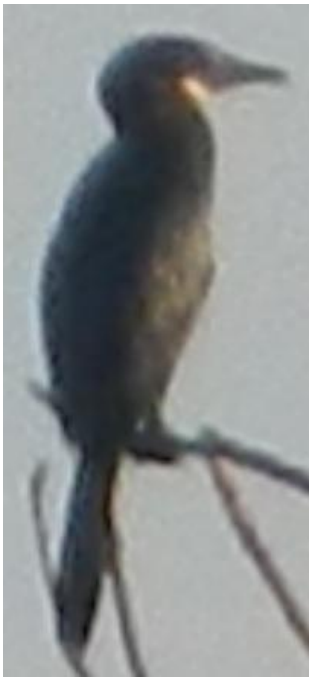
Black-winged stilt/common stilt/ pied stilt *Himantopus himantopus* പവിഴക്കാലി	
Common greenshank *Tringa nebularia* പച്ചക്കാലി	

Red wattled lapwing *Vanellus indicus* ചെങ്കണ്ണി തിത്തിരി	

White necked stork *Ciconia episcopus* കരുവാരക്കൊക്ക്	
Asian openbill/ Asian openbill stork *Anastomus oscitans* ചേരക്കൊക്കൻ	
White-breasted Waterhen *Amaurornis phoenicurus* കുളക്കോഴി	

Crow Pheasant/ Greater Coucal *Centropus Sinensis* ചെമ്പോത്ത്	
Asian Koel *Eudynamys scolopaceus* നാട്ടുകുയിൽ	
Black Kite/Pariah kite (above) *Milvus migrans* ചക്കിപ്പരുന്ത് Brahminy kite (below) *Haliastur indus* കൃഷ്ണപ്പരുന്ത്	

White-throated kingfisher *Halcyon smyrnensis* മീൻകൊത്തി ചാത്തൻ	
Indian roller *Coracias benghalensis* നാട്ടുപനങ്കാക്ക	
Blue-tailed bee-eater *Merops philippinus* വലിയ വേലിത്തത്ത	

White-Cheeked Barbet *Megalaima viridis* ചിന്നക്കുട്ടുറുവൻ	
Indian cormorant/ Indian shag *Phalacrocorax fuscicollis* കിന്നരി നീർകാക്ക	
Rose ringed parakeet *Psittacula krameri* മോതിരവളയൻ നാട്ടുതത്ത	

Rock Pigeon *Columba livia* മാടപ്രാവ്	
Spotted Owlet *Athene brama* പുള്ളിനത്ത്	
Indian Pitta *Pitta brachyura* കാവി	

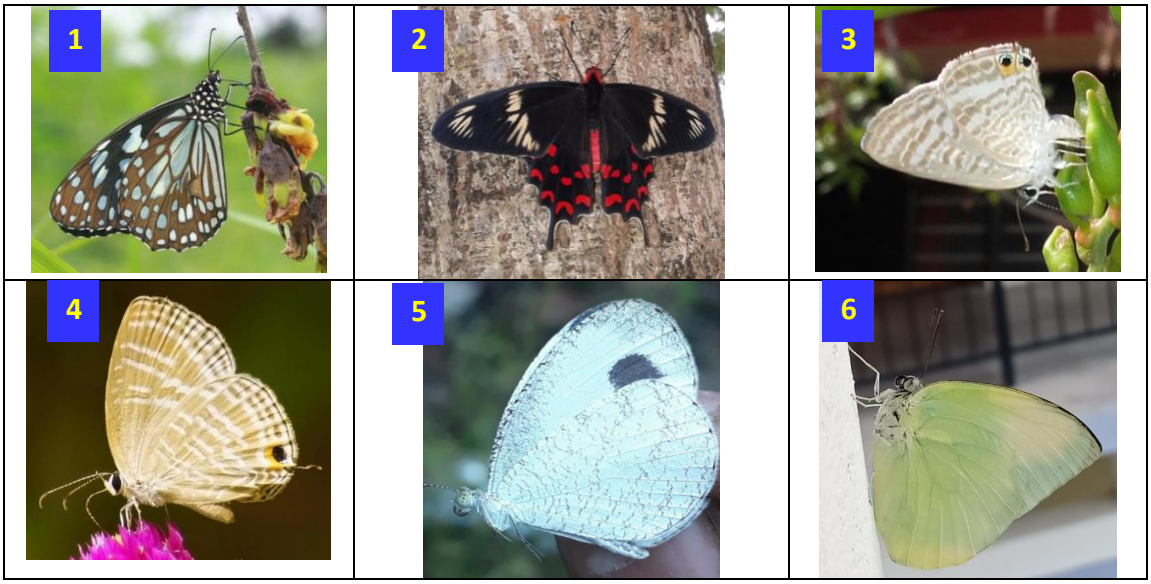
Black drongo *Dicrurus macrocercus* ആനറാഞ്ചി	
Eurasian Golden Oriole *Oriolus oriolus* നാട്ടുമഞ്ഞക്കിളി	
Oriental Magpie-Robin *Copsychus saularis* മണ്ണാത്തി	

Rufous Tree Pie *Dendrocitta vagabunda* ഓലേഞ്ഞാലി	
House crow *Corvus splendens* കാവതിക്കാക്ക	
Jungle crow *Corvus macrorhynchos* ബലിക്കാക്ക	

White headed babbler *Turdoides leucocephala* പൂത്താങ്കീരി	
White rumped munia *Lonchura striata* ആറ്റക്കറുപ്പൻ	
Purple Sunbird *Nectarinia (Cinnyris) asiatica* കറുപ്പൻ തേൻകിളി	
Red whiskered bull bull *Pycnonotus jocosus* ഇരട്ടത്തലച്ചി	

Asian (Indian) paradise flycatcher *Terpsiphone paradisi* നാകമോഹൻ പാറ്റപിടിയൻ	
Common myna *Acridotheres tristis* നാട്ടുമൈന	
Southern Jungle Myna *Acridotheres fuscus* കിന്നരി മൈന	

Diversity of Butterflies in and around Campus			
Sl. No.	**Scientific name**	**Common name**	**Native /Non**
1	*Tirumala septentrionisdravidarum*Dakhan	Dark Blue Tiger	Native
2	*Pachliopta hector*	Crimson Rose	Native
3	*Jamidescelenoblairana*	Andaman Common Cerulean	Native
4	*Jamidescelenoceleno*	Oriental Common Cerulean	Native
5	*Catopsiliapomona* (Fabricius, 1775)	Common Emigrant	Native
6	*Euthaliaaconthea* (Cramer, 1777)	Common Baron	Native
7	*Hypolimnasbolina* (Linnaeus, 1758)	Great Eggfly	Native
8	*Hypolimnasmisippus* (Linnaeus, 1764)	Danaid Eggfly	Native
9	*Neopithecopszalmora* (Butler 1870)	Quaker	Native
10	*Danausgenutia* Cramer.		Native
11	*Psyche Leptosianina* (Fabricius, 1793)		Native



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10 	11 	

Conclusions and Recommendations.

The Green audit conducted by the IQAC team identified following points.

- The campus is having a good water management strategy
- The campus is self sufficient in terms of water
- The campus have initiatives for reducing conventional energy
- The plastic free nature of the campus is commendable
- The tree planting drives and the canopy of the campus is proportional to constructed area
- Use of reusable vessels is a good initiative.

The audit report also put forward following recommendations for future

- Environmental auditing need to be conducted in every two year for reviewing the progress

- By installing solar panels in roof of the building, the conventional energy usage can be reduced to greater extend

- Inculcate environmental valued in student by hands on trainings and by minor projects
- More rain water pits need to be made
- Replace remaining traditional bulbs with LEDs
- Watering facility is to be installed in insitu conserved biodiversity park
- Use of limited water use flush (flush with stoppers) in the toiled for regulating water wastage

- Encourage maximum use of computers for reducing E-WASTE
- A strategy for managing E-Waste need to be implemented

*** Evidence:**

D = Direct sighting – E = Evidence of animal –,

ANNEXURE:

ANNEXURE:

Campus area:

Built up area:

Hard Surface:

Grassland:

Garden:

Audit framework questionnaire:

Tree Survey

Native Trees:

1. How many Alive Trees are there? 17 - What are their Species?
2. How many Alive Trees with Hollows are there? What are their Species?
3. How many Dead Trees are there? What are their Species?
4. How many Dead Trees with Hollows are there? What are their Species?

Exotic Trees:

1. How many Alive Trees are there? What are their Species?
2. How many Alive Trees with Hollows are there? What are their Species?
3. How many Dead Trees are there? What are their Species?
4. How many Dead Trees with Hollows are there? What are their Species?