ST. STEPHEN'S COLLEGE UZHAVOOR

GREEN AUDIT REPORT

January 2019

KOTTAYAM SOCIAL SERVICE SOCIETY

ENERGY AUDIT
WATER AUDIT
WASTE MANAGEMENT AUDIT
BIODIVERSITY AUDIT
CARBON AUDIT

Preface

Envisioned by the creative and the futuristic leadership of the Knanaya Catholic Church in 1964, St.Stephen's College was established in Uzhavoor. The College is affiliated to the Mahatma Gandhi University, Kottayam and ever since its inception has made an indelible mark in the higher education scenario of Kerala. The College started its functions modestly as a Junior college affiliated to the University of Kerala with 218 students in four Pre-degree batches and seven faculty members. With great visionaries like Rev. Msgr. Dr. Peter Uralil, the founder Principal, in its administrative hierarchy and diligent teaching staff, the institution set on a fast pace of development despite the initial handicap in transportation facilities and the difficulties of being in a remote rural location. In 1968, the College was upgraded from the status of a Junior college, with the introduction of Undergraduate courses in Mathematics, Physics, Zoology, Economics and English Literature. Now the institution has four Post Graduate courses and nine Undergraduate courses to its credit. This underlines the strong scholastic tradition of the institution that spans over half a century. The College was assessed and accredited for the first time in 2003 and was accorded with 'B+' grade status.
The growth of the infrastructure of the College has been in tune with its growth in its academics activities. The facilities available include technology enabled learning space, science, language and computer labs. The automated spacious library with INFLIBNET facilities and the provision to access reference books, e journals and widely circulated magazines is truly an asset to the College. The Research Cell of the College aims at promoting research culture among the faculty. The K.R Narayanan Study Centre, an interdisciplinary unit which concentrates on research on the ideas and concerns of the former President of India, Late Dr. K.R. Narayanan, has been instrumental in the conduct of seminars and symposiums in collaboration with other units and institutes in the society. We are earnestly looking forward to the upcoming NAAC peer team visit for the assessment and accreditation as it would definitely help us rectify our shortcomings and also ensure sincere efforts to optimize excellent educational environment. We are resolute to uphold our mission to provide knowledge and values. The College in its Golden Jubilee year is all spruced up for the NAAC visit and is eagerly looking forward to it.

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Executive Summary

The rapid urbanization and economic development at local, regional and global level has led to several environmental and ecological crises. It becomes essential to adopt the system of the Green Campus for the institute which invisages for sustainable development. The green auditing of St Stephen's College Uzhavoor, enables to assess the lifestyle, action and its impact on the environment. The methodology included: preparation and filling up of questionnaires, physical inspection of the campus, observation and review of the documentation, data analysis and recommendations. This audit was mainly focused on the indicators like consumption of energy in terms of electricity and fossil fuel, quantity and quality of water consumption, Waste management practices, assessment of Biodiversity and carbon footprint in the Campus.The criteria, methods and recommendations used in the audit were based on the identified risks. The cooperation and dedication shown by IQAC and CEERD club members of the College, during the audit phase was remarkable. The report pertaining to environmental management plan with strength, weakness and suggestions will be a useful tool for campus greening, resource management, planning of future projects, and a document for implementation of sustainable development of St Stephen's College Uzhavoor.

Fr. Sunil Perumanoor
Secretary
Kottayam Social Service Society(KSSS)
Kottayam

KOTTAYAM SOCIAL SERVICE SOCIETY
AWARENESS ENABLING DEVELOPMENT

1 Pre-Audit Stage

1.1 Introduction, Scope and Goal

Education means much more than acquiring knowledge or skills. it encompasses holistic development of the individual based on truthfulness, values and discipline. St. Stephen college Uzhavoor, with its distinct identity and tradition spanning more than half a century has been embracing its dear children towards fulfillment of 1 these goals. The college which belongs to the Arch-Diocese of Kottayam (Knanaya Catholic Community) is affiliated to the Mahatma Gandhi University. The College was graded B by the National Assessment and Accreditation Council (NAAC) in 2015. The brain child of His Excellency Rev. Dr. Thomas Tharayil, the then Bishop of the diocese of Kottayam, the college was established in 1964. Sri. Joseph Chazhikadan MLA and Rev. Fr. Peter Uralil, the first Principal of the college, were the guiding forces behind this noble endeavour. They were supported and encouraged by the active cooperation of the people of Uzhavoor and a host of well-wishers. The college is located in Uzhavoor, an expanding town in Kottayam district, Kerala in India. It is just 32 km away from the administrative capital Kottayam District. Since the area was famous for its agricultural practices, it is believed that the name Uzhavoor came from two Malayalam words Uzhavu (Ploughing or a word related to agricultural practices) and Ooru (Place or Region). When translated, it means The Land of Agriculture. The people of this village who belong to different religions and communities live here in peace, harmony, and unity. Former President of India K. R. Narayanan, who came from one of the poorest families of this village, is the role model for these people even today. St. Stephen's College is an academic fraternity of individuals dedicated to its motto. We strive to reach out to the star of human excellence based on the love of God and service to mankind as modelled in Jesus Christ, in a background of Indian heritage so as to produce intellectually trained, morally upright, socially committed and spiritually inspired citizens. Translating the vision into action, St. Stephen's College gives quality education that includes the imparting of sound learning, building of character, the spread of Truth and the knowledge of God. And inculcate moral values, social commitment and dignity of labour among the youth through value education programmes. Also helps to develop an attitude of reconciliation between man and nature which will help students to become peacemakers, defenders of the poor and keepers of the environment. In the beginning, St. Stephen's was a Junior College with four batches of Pre-Degree courses. The small step taken in 1964 culminated into a giant leap in a few decades. In 1968 the college was upgraded to the degree level. Today it has gained in strength and size with 4 postgraduate courses, 8 undergraduate courses, a computer centre, a media centre, a full-fledged library and its reading room, a big auditorium, a ladies' hostel, a well-functioning canteen, a co-operative store, spacious staff-rooms, rest rooms for students, a medicinal garden, a vermicompost unit, large grounds for sports and games, an indoor stadium and ample parking facilities. From its humble beginnings in remote and undeveloped place Uzhavoor, St. Stephen's College became the epicenter of development and progress of its locality in the past fifty years. The community comprises around 1100 students, 60 teachers and 25 members of the non-teaching staff. The dedication of the management and the community, combined with excellent infrastructural and teaching facilities help maintain high Standards in curricular and co-curricular spheres of the institution.

The road to excellence is an uphill task that calls for a consolidated effort by all the stake holders of the institution, comprising the management, staff, parents, alumni and the local community. Together they create a conducive atmosphere that ensures all round development of the students in particular and the community and society in general, elevating St. Stephen's College into greater and nobler heights, setting new benchmarks for excellence. In keeping with the lofty vision, St.stephen's College is a melting-pot of students from all communities and creeds, thus preserving a secular character by promoting the

ideal concept of love and service. The institution aims to empower and make student's life ready for an emerging world by inculcating in them the spirit of intellectual enquiry, independent thinking, self- reliance, leadership, co-operation, expression of cultural talents, social service and eco consciousness. The college prepares students to become Global Citizen through cooperation and peaceful coexistence and inspire them for lifelong learning.

CAMPUS INFRASTRUCTURE

MAIN BLOCK The main block of college was blessed by His Grace Mar Thomas Tharayil in 1964. The main building consisting of classrooms, Laboratories, principal's room, bursar's room, College office, various department, department libraries, College library, astroview centre, zoology Museum, Language lab, seminar hall, media room , Unarvu etc.

THE COLLEGE LIBRARY The college library is the key resource of information for the academic community. It started functioning right from the beginning of the College in 1964. At present it has attained the position of a First Grade Library with more than 34,000 books and 150 periodicals and a subscription of 10 newspapers. Xerox facility is also available in the library. The library is automated using 'Koha', a well known open source integrated library management software which has a number of advanced features, Enabling the college library to become more user oriented in the current digital era. Besides very suitable and convenient library administrative modules, Koha software can provide a handful of attractive interfaces from the user point of view, like Quick Search and access, Web-OPAC, and the feasibility of of integrating new technologies like RFID. The library has a website which lists the services offered by the library for users. It also provides links to other information resources. The college library consists of reference library, reading room and general library section. Photocopy service is also available in the library.

MSGR. PETER URALIL BIBLIOTHECAL INFORMATION CENTRE Msgr Peter Uralil Bibliothecal information Centre was established in the College Library in 1995. Msgr. Peter Uralil was the Founder Principal and Pro-manager of the College for a long time. The aims and objectives of the Centre are to improve the quality of education, to facilitate access to the library resources more efficiently, to improve house-keeping operations, to improve the efficiency or services to users and to provide career and course guidance. The students and staff of the college can have the services of the Centre during the working hours of the library.

BISHOP KUNNACHERRY COMPUTER CENTRE Bishop Kunnacherry computer centre was established as a nonprofit academic body with the specific mission of imparting high quality Computer Education to young men and women aspiring for a career in Computer technology. Over the years many students have benefited from the various training programmes of the center. As a token of recognition, the center has been granted with accreditation by the department of Electronics, Government of India. The centre provides high quality short-term and cost effective programs in software engineering and computer application. The centre is also affiliated to Xavier Board of computer education in India (XBCE). The centre has also been granted full accreditation by DOACC to conduct DOEACC 'O' LEVEL computer course. DOEACC Is an autonomous body of the Department of Information Technology, Ministry of Communications and Information Technology, Government of India.

BISHOP THARAYIL SEMINAR HALL Bishop Tharayil Seminar Hall is named after the Founder patron of the college, Bishop Mar Thomas Tharayil. This Seminar Hall with a capacity of more than 150 seats is equipped with all modern amenities. It is utilised for various college activities including regional and national seminars.

COLLEGE AUDITORIUM The College auditorium called, "The Chazhikattu Hall" is named after the late Sri Joseph Chazhikattu who was a member of the Kerala Legislative Assembly. He was a visionary who held the interests of the people of Uzhavoor close to his heart and was instrumental in getting Govt. sanction

for the college in 1964. This spacious Hall with a capacity of more than a thousand seats is utilised for all common functions of the college.

MEDIA CENTRE This centre has a seating capacity of fifty. It is equipped with art communication equipments which include an O.H.P. slide projector, L.C.D. and Computer. Instructional sessions are carried out here with the help of these modern gadgets.

ENGLISH LANGUAGE LAB The English Language Lab facilitates students to fine tune their communication skills. It can accommodate 24 students at a time and is equipped with modern amenities like computers, DVD Player, latest language software, LCD etc.

MEDITATION CENTRE – 'UNARVU" A special meditation centre named 'Unarvu" is open from 9 A.M. to 5.00 P.M. for the use of staff and students. It helps to be more peaceful . And this Discipline improves brain function, increase optimism and enhance alertness among students.

COMPUTER LAB The Commerce computer lab was installed in the year 2013 with the MP fund of Adv. John Abraham and The MLA fund of Advocate Mons Joseph. Lab is equipped with 40 computers, LCD and internet facility. And also there are computer labs for Chemistry, Physics, Zoology, Computer science departments.

HEALTH AND FITNESS CENTRE With grants received from the U.G.C. and the Ministry of Sports and Youth affairs, a health and fitness centre has been set up. The centre which cost about 6 lakhs is equipped with the latest state of the art multi gym facilities. Teachers and students may utilise the centre, from 2.30 p.m. to 8.30 p.m. on all week days. These facilities are also available to the Alumni and general public at nominal cost.

STORE There is a store functioning in the college by the members of entrepreneurship club. All items necessary for staff and students of the college are provided at a nominal price.Students can make use of this facility during morning, evening and noon breaks.

HOSTEL The girl students are provided neat and safe residential accommodation at hostel which is in the vicinity of the college.It can accommodate around 150 students and there are two separate study hall for under graduate and post graduate students.

MEDICINAL GARDEN The college has a species rich medicinal garden which consists of about 100 rare and valuable plants. The service of the garden is also open to the public of Uzhavoor panchayat. K R NARAYANAN STUDY CENTRE K R Narayanan Study Centre was established in St.Stephens College Uzhavoor in the year 2010 with assistance of University Grants Commission(UGC) under the scheme of Epoch Making Social Thinkers of India.This inter disciplinary centre concentrates on research on the life,ideas and concerns of Dr. K.R Narayanan and disseminates the result to the students, academics and policy making circles. The centre organize courses, lectures and seminars. It also documents the speeches and writings of Dr.K R Narayanan on various issues and maintains them for the benfit of researchers and students. It is also the duty of the cntre to bring out publications based on the research.

VERMI CULTURE UNIT. A Vermi Compost Unit was started in the college in 1999 as a Vanitha project sanctioned under the "Peoples Planning Project" of the Uzhavoor Block Panchayat. The objectives of the unit includes production and promotion of organic manure, training the students in vermi compositing etc.

COLLEGE CANTEEN There is a canteen within the campus, run on contract basis. The college canteen caters to the nutritional needs of the staff and students at subsidized rates. Noon meals and other food items are available here on all working days.

PROF.K.M MATHEW ASTROVIEW CENTRE Prof. K.M Mathew Astro view Centre was installed in the college as memorial of late Prof, K.M Mathew,the HoD of PhysicsAnd former principal of of the college. 2009 was observed as the International year of astronomy. The Astro view centre also stand as monument of the the IYA09 and the ruby jubilee of the department of Physics.The sender was sponsored by the family

of the former principal late Prof. K. M. Mathew .

UGC -NETWORK RESOURCE CENTRE UGC Network resource centre (UGC NRC) is a scheme introduced by the UGC in the tenth plan where assistance was provided for the purchase of computers and also for internet connectivity, which will continue in the 12th plan. The objectives of the scheme are to create awareness among staff and students about the use of computers in various activities. In our college NRC is attached with computer centre.

DST-FIST NETWORK LAB DST-FIST Network lab was established in 2017 using the Grand provided by Department of Science and Technology, Government of India . The lab has 10 all in one PC and a server computer. This facility is provided to Science Students for scientific computational studies. The lab is open during regular college timings.

INDOOR STADIUM The college indoor stadium is a multipurpose sports complex which provides good and enough facilities for various games. The stadium is Designed to house arena which can host number of indoor sports events like Basketball, badminton, table tennis tennis .etc. apart from Other cultural events .

COLLEGE GROUND College has a bigger and heavy ground for Football and cricket and also basketball court, tennis court, Volleyball court and badminton court. GOLDEN JUBILEE BLOCK As the part of half century celebration His Grace Mar Mathew Moolakkattu blessed our new Golden jubilee block in 2016 in presence of Sri. Jose K Mani MP and Sri. Mons Joseph MLA.

IQAC ROOM The IQAC room is a multi-purpose administrative room, Which is for IQAC members for their executive meetings and discussions.

NCC ROOM The college has a special room for National Cadet Corps. NCC training will foster 'esprit de-corps' among the cadets and instill in them a sense of discipline and selfless service for the defence of the country.

CEERD ROOM There is a room for CEERD (Centre for environmental education and rural development) which is an organisation established in 2001 to undertake studies related to the development problems of Uzhavoor panchayat and neighbouring areas and to identify the potential resources available in the area for sustainable development. The room for CEERD is used for the discussions and meetings related to all activities conducted by CEERD.

GUEST ROOM

There is a guest room which is located in the first floor for visitors. The guest room is primarily meant for official guest of the university, participants of seminar, workshops and other guests.

PARKING AREA

College has separate parking area for students and staff for two wheelers and four wheelers.

SECURITY ROOM

College has a security room at the entrance. So that the watch man who is available 24 hours can make sure the security of the college campus effectively. The real value of green audits is the fact that they are carried out, at defined intervals, and their results can illustrate improvement or change over time. Eco campus concept mainly focuses on the efficient use of energy and water minimization of waste generation or pollution and also economic efficiency. All these indicators are assessed in the process of Green Auditing of educational institute. Target areas included in this green auditing are water, energy, waste, green campus and carbon footprint.

SCOPE AND GOALS OF GREEN AUDITING

Green audit serve as a means to identify opportunities to sustainable development practices, enhance environmental quality, improve health, hygiene and safety, reduce liabilities and save money and achieve values of virtue. Environmental audits can be a highly valuable tool for college in a wide range of ways

to improve their environmental and economic performance and reputation – while reducing wastages and operating costs. Once a baseline data is prepared after the auditing process, the data can serve as a point of departure for further action in campus greening. It will also help the college to compare its programmes and activities with other peer institutions, identify areas for improvement and prioritize the implementation of future projects. The data will also provide a basis for calculating the economic benefits of resource conservation projects by establishing the current rates of resource use and their associated costs. Simple but effective system was devised and applied to prepare a baseline data and monitor the environmental performance of St. Stephen's College, Uzhavoor. The aim of green auditing is to help the institution to apply sustainable development practices and to set examples before the community and young learners.

General and Specific Objectives of Green Auditing

The essential purpose of an environmental audit is the systematic scrutiny of environmental performance throughout college's existing functions. At best, an audit is a comprehensive examination of management systems and facilities. Green Audit is the most efficient and ecological way to manage environmental problems. It is a kind of professional care which is the responsibility of each individual who are the part of social and environmental processes. It is necessary to conduct green audit in college campus because it helps the students to be aware of the green audit, its advantages and thereby Create health consciousness and promote environmental awareness, values and ethics. It provides staff and students better understanding of green impact on campus. Thus Green audit becomes necessary at the college level.

Environmental audit can be a highly variable tool for college in a wide range of ways to improve their environmental and economic performance and reputation-while reducing the wastage and operating cost. once a baseline data is prepared after the auditing process, the data can serve as a point of departure for further action in campus greening.It will also help the college to compare it programs and activities with other peer Institutions, identify areas for improvement and prioritise the implementation of future projects. The data will also provide a basis for calculating the economic benefits of resources conservation projects by establishing the current rates of resource use and their associated costs . Simple but effective system was devised and applied to prepare a baseline data and monitor the environmental performance of St. Stephen's College Uzhavoor. The aim of green auditing is to help the institution to apply sustainable development practices and to set examples before the community and young learners.

The general objective of green audit is to prepare a baseline report on biodiversity and other resources, measures to mitigate resource wastage and improve resource quality and sustainable practices. The specific objectives are:

- To prepare a checklist of flora and fauna diversity in and around the college campus.
- To suggest measures to improve biodiversity within the college campus.
- To monitor the energy consumption pattern of the college.
- To assess the quantity of water usage within the college campus.
- To suggest sustainable energy usage and water conservation practices.
- To find out various sources of organic and solid waste generation and mitigation possibilities.
- To inculcate values of sustainable development practices through green audit mechanism and enhance existing practices.

The Governing Council of the college asked the Principal to find a suitable organization to provide training and support regarding Green Audit and the Principal in the Staff Meeting authorized CEERD to conduct the audit process. After consultation with quite a few agencies the Principal along with CEERD and IQAC decided to render the expertise of KOTTAYAM SOCIAL SERVICE SOCIETY (KSSS), an environmental research and training organization situated in Kottayam, Kerala.Green Audit Agency

KOTTAYAM SOCIAL SERVICE SOCIETY (KSSS) is a leading environmental research and training organization in Kerala with several national and international linkages. KSSS is the pioneer for giving training for conservation of natural resources and environment protection. After consultation with KSSS a Memorandum of Understanding was prepared between St. Stephen's College and Kottayam Social Service Society to provide training for the conduct of Green Audit and equip the students to complete the report.

Green Audit Training by KOTTAYAM SOCIAL SERVICE SOCIETY (KSSS)

Training for staff and students were provided by KSSS on 1 December 2018. Fr. Sunil Perumanoor, Director KSS inaugurated the Green Audit Training. Dr. Shiney Baby Principal of St. Stephen's College presided the meeting and IQAC Co-coordinator Lt. Jais Kurian felicitated the meeting. The selected 60 students of CEERD along with teacher coordinators attended the training sessions which lasted till evening. The students were divided into five groups of 10 - 12 students, soon after the inaugural session for five audits. One Student coordinator and an Assistant coordinator was selected for each group. The schedule of various audit, time table and duty assignments for each students were fixed and assigned. Weekly progress and monitoring meeting was arranged regularly.

Management Support

The St. Stephen's college Manager and Governing Council extended whole hearted support and commitment in conducting Green Audit during the pre-audit meeting. The management decided to carry-out various environment friendly programmes such as efficient energy and water use practices, energy efficient electronic and computer goods purchase, proper segregation and waste disposable methods, water conservation methods, medicinal garden, butterfly garden, planting tree saplings, distribution of tree saplings to the community, observation of environment related days, nature camps, field trips, environmental club activities and so forth. The management is also keen to implement sustainable practices based on findings and suggestions from Green Audit report. The management is fully committed to inculcate virtues amongst students in conservation and preservation of nature.

1.2 Targeted Areas

Energy Audit

This indicator addresses energy consumption, energy sources , energy monitoring, lighting, appliances and vehicles. Energy use is clearly an important aspects of Campus sustainability and thus requires no explanation for its inclusion in the assessment . An energy audit establishes the baseline for any improvements in an organisation's energy use. It provides a comprehensive and systematic method for targeting cost effective efficiency gains. The energy audit is a detailed inventory of the energy performances of the institution carried out by an auditor. This indicator addresses energy consumption, energy sources, energy monitoring, lighting, appliances, and vehicles. Energy use is clearly an important aspect of campus sustainability and thus requires no explanation for its inclusion in the assessment.

Water Audit

Water audit is an assessment of how much water is used and how much water can be saved in the college. Conducting a water audit involves calculating water use and identifying simple ways for saving water in

the college.This indicator addresses water consumption , water sources, irrigation, storm water, appliances and fixtures. Many people in Uzhavoor have difficult access to drinking water. It is therefore essential that St Stephen's College Uzhavoor as an environmentally responsible institution should examine its water use practices. Water auditing is a mechanism for conserving water, which will grow in significance in the future as demand for water increases. This audits provide a way to catalog all water uses in a facility and identify ways to increase water use efficiency. The results can help to prioritize steps to implement cost-effective water-saving measures. The concerned auditor investigates the relevant method that can be adopted and implemented to balance the demand and supply of water.

This indicator addresses water consumption, water sources, irrigation, storm water, appliances and fixtures. Aquifer depletion and water contamination are taking place at unprecedented rates. It is therefore essential that any environmentally responsible institution should examine its water use practices.

Biodiversity Audit

According to the U.S. Department of Agriculture, "One acre of forest absorbs six tons of carbon dioxide and puts out four tons of oxygen. This is enough to meet the annual needs of 18 people".This shows the importance of Green audit in the college campus. The trees work hard to keep the air we breathe clean and healthy. Trees, shrubs and turf also filter air by removing dust and absorbing other pollutants like carbon monoxide, sulfur dioxide and nitrogen dioxide. Trees control climate by moderating the effects of the sun, rain and wind. Leaves absorb and filter the sun's radiant energy, keeping things cool in summer. Trees also preserve warmth by providing a screen from harsh wind. Trees also lower the air temperature and reduce the heat intensity of the greenhouse effect by maintaining low levels of carbon dioxide.College campus is a place where large number of students are gathering. So it is necessary to have sufficient number of trees and plants to improve the quality of air and getting healthy atmosphere . Our parks, playgrounds and backyards are lined with trees that create a peaceful and aesthetically pleasing environment and help to reduce mental stress. All plant and animal species - including humans - are linked together in a complex web of life; we depend upon biodiversity for our survival. Biodiversity is the key to a healthy eco- systems and ultimately to a healthy planet. It keeps the air and water clean, regulates our climate and provides us food, shelter, clothing, medicine and other useful products. Each part within this complex web diminishes a little when one part weakens or disappears. The trees strive to keep the air we breathe clean and healthy. Their leaves take in much of the poisonous unwanted carbon dioxide in the air, and replace it with the oxygen we need for healthy living. In this process, the plants with the help of sunlight, water, minerals and the green material called Chlorophyll within the leaves change the carbon-dioxide into food for themselves. When doing this they release oxygen into the air which is vital for all life on earth. The roots of trees dig deep into the earth and hold it together so that the rain and wind can not wash or blow it away. This is very important as the earth has only a very thin layer (seldom more than one foot) of fertile soil covering it.

Biodegradable and hazardous Waste Audit

This indicator addresses biodegradable waste from college and hostel canteen, paper waste to hazardous wastes of Laboratories and worn out electric and electronic goods and plastic waste. Hazardous materials represent significant risk to human health and ecological integrity. Hazardous wastes are also leached out through the e-waste generated in the campus. They often persist in the environment leaving a legacy of land and water contamination for generations. They also accumulate in the tissues of organisms and become concentrated within food chains, leading to cancer, endocrine disruption, birth defects and other tragedies. The minimization, safe handling and ultimate elimination of these materials are essential to the long-term health of the planet. solid waste often includes wasted material resources that could otherwise be channeled

into better service through recycling, repair, and reuse. Thus the minimization of solid waste is essential for a sustainable college. The auditor diagnoses the prevailing waste disposal policies and suggests the best way to combat the problems. This indicator addresses biodegradable waste from college and hostel canteen, paper waste to hazardous wastes of laboratories and worn-out electric and electronic goods, and plastic wastes. Hazardous materials represent significant risks to human health and ecological integrity. Hazardous wastes are also leached out through the e-waste generated in the campus. They often persist in the environment leaving a legacy of land and water contamination for generations. They also accumulate in the tissues of organisms and become concentrated within food chains, leading to cancer, endocrine disruption, birth defects, and other tragedies. The minimization, safe handling, and ultimate elimination of these materials are essential for the long-term health of the planet.

Carbon foot print Audit

A carbon footprint audit can highlight all contributory causes of carbon dioxide emissions and establish overall carbon dioxide generation. It enables college to see exactly where to take measures to reduce their carbon footprint. Students are passionate about making their campuses more sustainable and are trying hard to make it happen. Carbon footprint is produced via direct emissions of greenhouse gases associated with combustion of fossil fuels for heating and transportation, indirect emissions associated with electricity purchase and finally other emissions related to solid waste, refrigerants, land use management, etc.The most common greenhouse gases are carbon dioxide, water vapour, methane, nitrous oxide and ozone.

An important aspect of doing an audit is to be able to measure the impact so that we can determine better ways to manage the impact. In addition to the water, waste, energy and green audits we can also determine what our carbon footprint is, based on the amount of carbon emissions created. One aspect is to consider the distance and method travelled between home and college every day. It undertakes the measure of bulk of carbon dioxide equivalents exhaled by the organization through which the carbon accounting is done. It is necessary to know how much the organization is contributing towards sustainable development. To become carbon neutral, Colleges are trying to reduce their emissions of greenhouse gases, cut their use of energy, use more renewable energy, and emphasize the importance of sustainable energy sources. Commutation of stakeholders has an impact on the environment through the emission of greenhouse gases into the atmosphere, consequent to burning of fossil fuels (such as petrol). The most common greenhouse gases are carbondioxide, water vapour, methane, nitrous oxide and ozone. Of all the greenhouse gases, carbon dioxide is the most prominent greenhouse gas, comprising 402 ppm of the Earth's atmosphere. The release of carbon dioxide gas into the Earth's atmosphere through human activities is commonly known as carbon emissions.An important aspect of doing an audit is to be able to measure your impact so that we can determine better ways to manage the impact. In addition to the water, waste, energy and biodiversity audits we can also determine what our carbon footprint is, based on the amount of carbon emissions created. One aspect is to consider the distance and method traveled between home and college every day. It undertakes the measure of the bulk of carbon dioxide equivalents exhaled by the organization through which the carbon accounting is done. It is necessary to know how much the organization is contributing towards sustainable development. It is therefore essential that any environmentally responsible institution examines its carbon footprint.

Management Support

The St. Stephen's college Manager and Governing Council extended whole hearted support and commitment in conducting Green Audit during the pre-audit meeting. The management decided to carry-out various environment friendly programmes such as efficient energy and water use practices, energy efficient electronic and computer goods purchase, proper segregation and waste disposable methods, water conservation methods, medicinal garden, butterfly garden, planting tree saplings, distribution of tree saplings to

the community, observation of environment related days, nature camps, field trips, environmental club activities and so forth. The management is also keen to implement sustainable practices based on findings and suggestions from Green Audit report. The management is fully committed to inculcate virtues amongst students in conservation and preservation of nature.

1.3 Survey Forms

Energy Audit

Room No. / name	Electrical device/ items	Number	Power	Usage time (hr/day)

Water Audit

Sl.no.	Parameters	Responses	Remarks
1	Source of water		
2	No of Wells		
3	No of motors used		
4	Horse power – Motor		
5	Depth of well –Total		
6	Water level		
7	Number of water tanks		
8	Capacity of tank		
9	Quantity of water pumped every day		
10	Any water wastage/why?		
11	Water usage for gardening		
12	Waste water sources		
13	Use of waste water		
14	Faith of waste water from labs		
15	Whether waste water from labs is mixed with ground water		
16	Any treatment for lab water		
17	Whether any green chemistry method practiced in labs		
18	No of water coolers		
19	Rain water harvest available?		
20	No of units and amount of water harvested		
21	Any leaky taps		
22	Amount of water lost per day		

Biodiversity Audit

Questionnaire

1. Is there a garden in your college? If yes what is the Area?
2. Do students spend time in the garden?
3. List the plants in the garden, with approx. numbers of each species.
4. Suggest plants for your campus. (Trees, vegetables, herbs, etc.)
5. List the species planted by the students, with numbers.
6. Whether you have displayed scientific names of the trees in the campus?
7. Is there any plantations in your campus? If yes specify area and type of plantation.
8. Is there any vegetable garden in your college? If yes how much area?
9. Is there any medicinal garden in your college? If yes how much area?
10. What are the vegetables cultivated in your vegetable garden? (Mention the quantity of harvest in each season)
11. How much water is used in the vegetable garden and other gardens? (Mention the source and quantity of water used).
12. Who is in charge of gardens in your college?
13. Are you using any type of recycled water in your garden?
14. List the name and quantity of pesticides and fertilizers used in your gardens?
15. Whether you are doing organic farming in your college? How?
16. Do you have any composting pit in your college? If yes What are you doing with the compost generated?
17. What do you doing with the vegetables harvested? Do you have any student market?
18. Is there any botanical garden in your campus?
19. If yes give the details of campus flora.
20. Give the number and names of the medicinal plants in your college campus.
21. Any threatened plant species planted/conserved? 21. Is there a nature club in your college? If yes what are their activities?
22. Is there any arboretum in your college? If yes details of the trees planted.
23. Is there any fruit yielding plants in your college? If yes details of the trees planted.

24. Is there any groves in your college? If yes details of the trees planted.
25. Is there any irrigation system in your college?
26. What is the type of vegetation in the surrounding area of the college?
27. What are the nature awareness programmes conducted in the campus?
28. What is the involvement of students in the green cover maintenance?
29. What is the total area of the campus under tree cover? Or under tree canopy?
30. Share your IDEAS for further improvement of green cover.

Biodegradable and Hazardous Waste Audit

Approximate amount of waste generated per day (in Kg)

Sources	Biodegradable	Non -biodegradable	Hazardous	Others
Office				
Laboratories				
Canteen and kitchen				
Staff Rooms				

Carbon foot print

Questionnaire

1. Total number of vehicles used by the stakeholders of the college.(per day)
2. No of cycles used
3. No of two wheelers used (average distance travelled and quantity of fuel and amount used per day)
4. No of cars used (average distance travelled and quantity of fuel and amount used per day)
5. No of persons using public transportation
6. No of persons using college conveyance
7. No of generators used per day
8. Amount of fuel used
9. Number of LPG cylinders used in canteen/labs
10. Use of any other fossil fuels in the college
11. Any suggestion to reduce the use of fuel

2 Audit Stage

Green auditing was done, by the involvement of different students from CEERD, NSS, NCC, Forestry Club, Birds club supported by teaching and non-teaching staff of the College. The green audit began with the teams assessing through all the different facilities at the college, determining the different types of appliances and utilities (lights, taps, toilets, fridges, etc.) as well as measuring the usage per item (Watts indicated on the appliance or measuring water from a tap) and identifying the relevant consumption patterns (such as how often an appliance is used) and the impact that they have. The staff and learners were interviewed to get details around usage, frequency or general characteristics of certain appliances. Data collection was done in the sectors such as Energy, Water, Biodiversity and Waste management.

2.1 List of Students and Staffs involved

Energy Audit

Faculty in charge : Anu Thomas

List of students

Sl.No.	Name	Department	Club
1	Eldo K Elias (Leader)	Physics	CEERD
2	Jaison Thomas	Physics	CEERD
3	Kausthub Rajan	Chemistry	CEERD
4	Mareena Sunny	Mathematics	CEERD
5	Rejna Suresh	Zoology	CEERD
6	Sabin James	Physics	CEERD
7	Anasiya Benny	Chemistry	CEERD
8	Devika Ashok	Chemistry	CEERD
9	Gopika S Vinodh	Physics	CEERD
10	Kripadas Murali	Zoology	CEERD

Water Audit

Faculty in charge : Aby Jimson

List of students

Sl.No.	Name	Department	Club
1	Abin C Joy (Leader)	Mathematics	CEERD
2	Akshay K Babu	Economics	CEERD
3	Aswathy M S	Physics	CEERD
4	Boban Biju	Zoology	CEERD
5	Devika Ashok	Chemistry	CEERD
6	Justeena Thomas	Economics	CEERD
7	NamithaJayan	Zoology	CEERD
8	Divya S Nair	B Com	CEERD
9	Gopika S	Economics	CEERD
10	Unnimaya Raju	English	CEERD

Biodiversity Audit

Faculty in charge : Dr.Sincy Joseph

List of students

Sl.No.	Name	Department	Club
1	SaranyaLal (Leader)	Zoology	CEERD
2	Sreelakshmi P A	Physics	CEERD
3	Stebin T B	English	CEERD
4	Aswin Kumar	English	CEERD
5	James Thomas	Physics	CEERD
6	Jomol John	Mathemathics	CEERD
7	AparnaRaju	Physics	CEERD
8	Basil Jose	Chemistry	CEERD
9	Niji B	Zoology	CEERD
10	Varsha Vijayan	Physics	CEERD

Waste Management Audit

Faculty in charge : Abhishek Thomas

List of students

Sl.No.	Name	Department	Club
1	Rajalakshmi S (Leader)	Economics	CEERD
2	Parvathy Saju	Physics	CEERD
3	Nikhitha Rajan	B Com	CEERD
4	Mohith Manoharan	Economics	CEERD
5	Nayanthara Saji	Zoology	CEERD
6	Amaldev S	Economics	CEERD
7	Anakha K R	Economics	CEERD
8	Ajay P Anil	Zoology	CEERD
9	Alan Cyril	Physics	CEERD
10	Ananthu Sabu	B Com	CEERD

Carbon Footprint Audit
Faculty in charge : Thomas Mathew
List of students

Sl.No.	Name	Department	Club
1	Abhijith P S (Leader)	Physics	CEERD
2	Alexander Cyriac	English	CEERD
3	Hari N	Mathematics	CEERD
4	Aiswarya T	English	CEERD
5	Amrutha N Nair	B Com	CEERD
6	AnchalSagar	Zoology	CEERD
7	Anjana Kunjumon	Zoology	CEERD
8	Jayalal J M	Physics	CEERD
9	Archa Rajesh	Physics	CEERD
10	Priskamol Peter	B Com	CEERD

2.2 Site Inspection and data Collection

Site inspection was done by Faculty and students. The process of green audit was an enriching environmental awareness programme for the students who participated in the Green auditing. The experience of green auditing was a first time experience for most of the students. They shared their expectations about a Green campus and gave suggestions for the audit recommendations3.3 Review of documents and records.Documents such as electricity bills and water charge remittance bills, laboratory registers, purchase register, and stock registers were examined and data was collected. College calendars, IInd phase NAAC self-assessment reports were also verified as part of data collection

Review of policies

Discussions were made with the college Governing Council members and with the Principal regarding policies on environmental management. The college is very keen in bringing green practices in order to make an environment friendly center for learning and research. The management is eager to understand the measures practiced in disposal of hazardous waste and better waste disposal or recycling methods possible. The management is keen in installation of renewable energy sources and hence bring down the excessive cost and wastage of financial resources.

Audit teams

Teams for various auditing were formed in order to collect information and map the electrical and water equipment's and devices used in various buildings and campus premises. The information thus gathered was marked in the structured questionnaire for further analysis. With the expertise of faculty's in Zoology and Botany departments flora and fauna diversity were identified and listed. Water outlets fixed in the college garden, playground, biodiversity garden, and every nook and corner were identified and marked in order to find out its quantity used and frequency of usage.

2.3 Energy Audit

(Average values of consumption are included in the Table)

Appliance	No.of appliances	Power rating (Watts)	Total Power (KW)	Operation per day (Hours)	No.of days in a month	Average usage per month (KWh)
bulb - Incandescent	16	60	0.96	2	22	42.24
CFL	1	15	0.02	2	22	0.66
LED bulb	164	9	1.48	2	22	64.944
Photocopier	4	200	0.80	1	15	12
Fan	292	75	21.90	4	22	1927.2
AC	4	1000	4.00	3	22	264
Desktops	119	150	17.85	2	22	785.4
Laptops	1	50	0.05	4	22	4.4
Tube lights	242	60	14.52	2	22	638.88
Printers	19	40	0.76	1	15	11.4
Water cooler cum purifier	5	300	1.50	3	22	99
LCD Projector	3	300	0.90	1	15	13.5
Refrigerators	2	250	0.50	5	22	55
Water pump	1	11936	11.94	1	24	286.464
Television	2	140	0.28	5	22	30.8
Inverters	10	100	1.00	3	22	66
Water heaters	1	400	0.40	1	7	1.4
Diesel generators	2	2000	4	1	2	8
Public addressing system	3	300	0.90	1	15	13.5
UPS	6	100	0.60	5	22	66
TOTAL (KWh)						**4390.79**

Laboratory Usages

Physics						
Appliance	**No.of appliances**	**Power rating (Watts)**	**Total Power (KW)**	**Operation per day (Hours)**	**No.of days in a month**	**Average usage per month (KWh)**
Michelson's Apparatus	2	300	0.6	2	1	1.2
e/m apparatus	2	400	0.8	2	1	1.6
Photoelectric effect apparatus	2	400	0.8	2	1	1.6
Constant deviation Spectrophotometer	1	200	0.2	2	1	0.4
LCR meter	1	100	0.1	2	2	0.4
I C trainer kit	6	100	0.6	2	2	2.4
Electronics and electrical practical average power	1	200	0.2	2	2	0.8
Mercury vapor lamp	2	200	0.4	2	2	1.6
Sodium vapor lamp	2	200	0.4	2	2	1.6
Chemistry						
UV-Vis Spectrometer	1	200	0.2	1	3	0.6
Rotary vacuum evaporator	1	450	0.45	1	17	7.65
Hot plate	2	2000	4	1	1	4
Vacuum pump	1	750	0.75	2	18	27
Hot air oven	1	500	0.5	1	22	11
Distillation unit	1	750	0.75	1	16	12
Ice flaking machine	1	250	0.25	1	15	3.75
Microwave oven	1	1300	1.3	1	15	19.5
Magnetic stirrer	1	250	0.25	1	18	4.5
electronic balance	3	40	120	3	23	2
BOD incubator	1	750	0.75	0.25	3	0.5625
Total(KWh)						**103.37**

Zoology						
Appliance	**No.of appliances**	**Power rating (Watts)**	**Total Power (KW)**	**Operation per day (Hours)**	**No.of days in a month**	**Average usage per month (KWh)**
BOD incubator	1	750	0.75	2	1	1.5
Hot air laboratory oven	1	1000	1	2	1	2
Shaker	1	200	0.2	1	1	0.2
Water bath	1	750	0.75	2	1	1.5
High speed table top centrifuge	1	1000	1	1	1	1
Remi Cenrtifuge	1	1500	1.5	1	1	1.5
microwave oven	1	1200	1.2	1	1	1.2
Botany						
Autoclav	1	6000	6	1	1	6
incubator	2	2000	2	1	1	2
magnetic stirrer	1	250	0.25	1	1	0.25
Laminar flow hud	1	500	0.5	1	2	1
Total(KWh)						**18.15**

Energy Usage

Electricity charges – Rs 53,400 / month
Cost of Gas cylinders – Rs 7,920 / month
Cost of generator fuel – Rs 4,000 / month

The total energy utilization of the college for different purposes is approximately 4600 kWh/month. Alternate source of energy comprising solar type of non-conventional category of energy will be a good energy management system for the college. No greenhouse gas emissions are released into the atmosphere when you use solar panels to create electricity. And because the sun provides more energy than we'll ever need, electricity from solar power is a very important energy source in the move to clean energy production. Electricity charges per month is Rs.53,400/-month. Energy saving through the replacement of incandescent bulbs to LED light may be a good energy management system for the college. Awareness programmes for the stakeholders to save energy may also increase sustainability in the utilization of various energy source. Although staff are encouraged to switch off their own lights, monitors and other equipment, the college administrative staff should carry out a lock down of the building at the end of every day and switch off any lights or equipment that have been left on. All the incandescent bulbs have to be replaced by low energy bulbs. Lighting in the library should be predominately LEDs and energy saving bulbs. The College should improve its monitoring and reporting of energy usage and provide information to campus users. Older wiring if necessary has to be replaced. The college building is nearly 55 years old, there fore wiring maybe replaced from electricity leakage and to protect college and its appliances from potentially dangerous or expensive damage that may arise due to faulty wiring.

Existing energy management methods in the campus

- The college produces LED bulbs as an outreach program organised by Dept. of Physics with the support of students.

- Energy saving campaigns are organised by CEERD
- Older and damaged equipment's are replaced if necessary.
- Wiring and electrical maintenance are periodically monitored and replacements are made.

2.4 Water Audit

The water audit was done during the second week February where the usage of water is at the peak. The college uses 14800 litres of water every day. The main source of water is ground water. Water from the public water supply is also utilized. 405 Litres of water is lost through the leaking of pipes.Leakage has to be prevented and various other sources of water need to be found out as well. If water treatment system is installed at canteen and chemical laboratories the amount of water lost through pollution can be prevented. A major preference to the recycling of water may be adopted in the college for an efficient water management. Awareness programmes for the management of sustainable water use will be highly efficient in this college. Efficient water saving devices should be installed in all toilets. New toilets that are to be installed should have a dual flush system in place. Water management systems are to be introduced in the urinals. Some alternatives include spray taps, which can save about 80 percentage of water and energy used for hand washing. Consider carrying out meter readings on a regular basis (e.g. bi-monthly) in order to monitor water usage. Not only will this make checking water bills much easier but will also allow a baseline to be set from which further reductions can be measured, as well as possibly altering the any leaks.

Overall Usage of Water in the Campus

Sections	water use per day
Toilets and urinals	18,000 Ltr
Hostel	3,500 Ltr
Bathrooms	Ltr
Canteen	5,000 Ltr
Garden and ground	2,500 Ltr
Laboratories	1,500Ltr
Leakage	405 Ltr

Existing water management methods installed in the campus

- Rain water harvesting system of 40000 litre capacity has been installed.
- Water conservation and green awareness campaigns has been conducted on behalf of CEERD and NSS
- Rain water collection pits are digged inorder to recharge ground water.
- More greenery has been added consistently inorder to improve ground water resource

2.5 Waste measure and its disposal

- Total Stakeholders – 1100
- Class rooms –35
- Other rooms –32

- Number of hostel inmates - 120
- Number of Garbage dumps – 5
- Number of toilets - 59

Quantity of waste generated

- Bio degradable – 1 kg/day (office)
- Non bio degradable – 0.5 kg/day (office)
- Bio degradable – 0.3 kg/day (labs)
- Non-bio-degradable – 0.5 kg/day (labs)
- Hazardous waste – ½ kg/day
- Canteen waste (biodegradable)– 14 kg/day
- Non-biodegradable – ½ kg/day

Amount of Waste Estimated

Biodegradable waste = 24 kg/day
Non-biodegradable waste = 2 kg/day
A composting pit is highly essential for the treatment of bio degradable waste generated from the canteen, hostels, food leftover by students and staff, office, vegetable garden and from the college campus cleaning process. Different methods such as pit composting, vermi-composting, bacterial composting using bacterial consortium, may be used to treat the bio degradable waste. Hazardous waste such as chemical waste from laboratories, E-waste, plastic, glass, tin waste etc. generated from the college can be collected properly and may be handed over to the local self-governments treatment yards or else college should install proper chemical disposing unit. E-waste, plastic and glass bottles, other plastic wastes, cans, broken glass wares, tins etc., may be recycled or sold out. The College has missed few major recycling opportunities, with the exception of food waste from the dining halls.
Proposal Bio gas plant near canteen. increasing the capacity of existing sanitary napkin incinerator in girl's washroom. Different coloured bins maybe placed in order to collect and segregate various types of waste. Training and campaigns in paper bag making for students and staff will reduce use of throw away plastic carry bags. Periodical training in health and hygiene, waste management and disposal, green healthy practices may inculcate a positive attitude for a clean and healthy living. There should be proper sign boards displayed to tell students where to go for the disposal of other recyclables, plastics and hazardous wastes. Disposable plates and glasses should be replaced with metal equivalent. There should be in place a policy for the handling and disposal of hazardous materials. The college should have in place plans for dealing with hazardous wastes in academic departments (art, chemistry, etc.) as well as the maintenance activities (paints, etc.). The college should ensure that the hazardous materials are disposed of properly. Chemistry department may change their experiments to green chemistry. (Green chemistry is the utilisation of a set of principles that reduces or eliminates the use or generation of hazardous substances in the design, manufacture and application of chemical products.) St.Stephen's college is committed to manage chemical wastes produced in its practical and research laboratories in a safe and environmentally sound manner that

complies with all applicable central and state government regulations. At present in different laboratories of all science streams, following categories of chemicals are in use: Oxidizers, Oxidizing acids, Flammable liquids, Basic flammable liquids, Inorganic bases, Organic bases, Acidic Flammable Liquids, Organic Acids, Inorganic acids, Poisons (Toxic chemicals), Sulphides, Water-reactive, Water-Reactive acids and Non-Hazardous or non regulated chemicals. The college will develop and implement proper management practices in the handling, storage, and disposal of chemical wastes that are generated in its laboratories. The handling and storage will be the areas where college will take adequate steps in the campus itself while disposal will be done in cooperation with a suitable outside agency. The handling and storage will be strictly according to the "Chemicals Waste Management Guidelines". As part of the guidelines, hazardous waste determination will be carried out for the waste form all laboratories and it will be stored in separate appropriate containers. As part of the hazardous waste management, the laboratories will take essential steps to minimise the quantity of waste, set up a satellite accumulation area, properly label all waste containers, close the waste containers to minimise exposure to atmosphere, and contact the collaborating waste disposal agency for a pick up. The college will be strict on the source reduction of chemical waste. Laboratories will be asked to maintain the purchase of smallest quantities of chemicals for particular purposes, and share surplus chemicals with other laboratories. A shift from mercury based instruments (eg. mercury thermometer) to digital substitutes (eg. digital thermometer) will be made gradually. Laboratories will be asked to perform minimum scale experiments and keep software assisted chemical storage data to avoid duplicate purchases. Hazardous waste Satellite accumulation areas will be maintained under strict and proper guidelines. The guidelines will address the requirements of the satellite storage area, properties of storage containers, storage limit and storage period before pick up. Proper labelling of the storage containers will be done which will ease the disposal process. Individual safety of the students and staff working in the laboratories will be ensured along with the waste management guidelines. The college will provide the safety wears to all in the laboratory and wearing them will be made mandatory. Safety alarms will be installed in all laboratories and students will be given training to use fire extinguishers in emergency situations of fire and explosion. Fire extinguishing cylinders will be installed in all laboratory areas. In addition, eye bath facility and open area showers will be introduced in front of all chemical laboratories. First aid boxes will be installed in all departments to help students who can possibly be injured while performing an experiment.

Existing waste management methods practiced

- Cleaning the campus on daily basis.
- Vermi compost
- Bio gas
- Segregation of waste into degradable and non-degradable by the cleaning staff.
- Waste bin's placed in corridors, office and staff rooms.
- E-wastes- computers, electrical and electronic parts – Disposal by selling
- Plastic waste- move to collection centre run by Uzhavoor Panchayat, dumping pit
- Waste treatments – Bio gas plant and compost system
- Paper waste for recycling under the initiative of CEERD

- E-waste and plastic waste disposal at panchayat collection centre.
- Campaigns for reduce, reuse and recycle by CEERD
- Paper Pen and Bag production by NSS and CEERD

2.6 Biodiversity Audit

LIST OF CAMPUS PLANTS

Sl. No.	Location	Botanical Name	Local Name	Family	No. of Plants
1.	Volleyball Ground	Bamboosa vulgaris	Bamboo	Poaceae	4
2.	Volleyball Ground	Bamboosa Bambos	Illi	Poaceae	2
3.	Volleyball Ground	Mangifera indica	mavu	Anacardiaceae	1
4.	Volleyball Ground	Sweitenia mahogany	mahagony	Meliaceae	5
5.	Volleyball Ground	Carica Papaya	kappalam	Caricaceae	1
6.	Volleyball Ground	Ficus benghalensis	aal	Moraceae	1
7.	Foot ball Ground	Mangifera indica	mavu	Anacardiaceae	1
8.	Foot ball Ground	Bamboosa Bambos	illikootam	Poaceae	2
9.	Foot ball Ground	Carica Papaya	kappalam	Caricaceae	1
10.	Foot ball Ground	Ailanthus excels	pongalyam	Simaroubiaceae	1
11.	Foot ball Ground	Delonix regia	gulmohar	Caesalpiniaceae	12
12.	Foot ball Ground	Cocos nucifera	thengu	Arecaceae	2
13.	Entrance	Delonix regia	gulmohar	Caesalpiniaceae	1
14.	Entrance	Bauhinia acuminata	Mandaram	Fabaceae	1
15.	Entrance	Cocos nucifera	Thengu	Arecaceae	5
16.	Entrance	Mimusops elengi	Elanji	Sapotaceae	1
17.	Entrance	Trachycarpus fortunei	Garden Palm	Arecaceae	13
18.	Canteen side	Sweitenia mahogany	Mahagony	Meliaceae	3
19.	Canteen side	Carica Papaya	Kappalam	Caricaceae	2
20.	Garden	Psidium guajava	Paera	Myrtaceae	2
21.	Garden	Casuarina equisetifolia	Kattadimaram	Casuarinaceae	4
22.	Garden	Cocos nucifera	Thengu	Arecaceae	12
23.	Garden	Wodyetia bifurcata	Foxtail palm	Arecaceae	3
24.	Garden	Livistonia chinensis	Garden Fan palm	Arecaceae	4
25.	Garden	Duranta repens	Golden Duranata	Verbenaceae	4
26.	Garden	Araucaria araucana	Chile pine	Araucariaceae	3
27.	Garden	Bamboos vulgaris	Mula	Poaceae	1
28.	Garden	Cananga odorata	Manoranjini	Annonaceae	1
29.	Garden	Artocarpus hirsute	Anjili	Moraceae	1
30.	Garden	Raphis flabelliformis	Red palm	Arecaceae	2
31.	Garden	Hamelia patens	Hamelia	Rubiaceae	2
32.	Garden	Sweitenia mahogany	Mahagony	Meliaceae	1
33.	Garden	Tecoma stans	Yellow bell	Bignoniaceae	1
35.	Garden	Bougainvillea glabra	Bogainvilla	Nyctaginaceae	1
36.	Garden	Bauhinia acuminata	Mandaram	Fabaceae	2
37.	Garden	Plumeria rubra	Chempakam	Apocyanceae	4
38.	Hostel Entrance	Artocarpus hirsute	Anjili	Moraceae	1
40.	Hostel Entrance	Terminalia catappa	Badam	Combretaceae	1
41.	Chazhikattu hall plot	Lantana camara	Kongini	Verbenaceae	1
42.	Chazhikattu hall plot	Gliricidia sepium	Seema konna	Caesalpiniaceae	1

Sl. No.	Location	Botanical Name	Local Name	Family	No. of Plants
43.	Chazhikattu hall plot	Azadiracta indica	Arya veppu	Meliaceae	1
44.	Chazhikattu hall plot	Aristolochia indica	Easwaramuli	Aristolochiaceae	1
45.	Chazhikattu hall plot	Biancaea sappan	Pathimugham	Fabaceae	1
46.	Chazhikattu hall plot	Phyllanthus emblica	Nelly	Euphorbiaceae	1
47.	Chazhikattu hall plot	Bignonia capreolata	Bignonia	Bignoniaceae	1
48.	Chazhikattu hall plot	Desmodium gangeticum	Orila	Fabaceae	1
49.	Chazhikattu hall plot	Phyllanthus myrtifolius	Hedge plant	Euphorbiaceae	1
50.	Chazhikattu hall plot	Enterolobium saman	Mazhamaram	Mimosaceae	1
51.	Chazhikattu hall plot	Casuarina equisetifolia	Choolamaram	Casuarinaceae	1
52.	Chazhikattu hall plot	Albizzia odoratissima	Vaka	Mimosaceae	4
53.	Chazhikattu hall plot	Azadiracta indica	Aryaveppu	Meliaceae	1
54.	Chazhikattu hall plot	Asoka indica	Asokam	Fabaceae	1
55.	Chazhikattu hall plot	Croton sp. L.	Rush foil	Euphorbiaceae	3
56.	Chazhikattu hall plot	Euphorbia pulcherrima	Poinsettia	Euphorbiaceae	1
57.	Chazhikattu hall plot	Hevea brasiliensis Mull. Arg.	Rubber	Euphorbiaceae	1
58.	Chazhikattu hall plot	Costus igneus	Insulin plant	Costaceae	1
59.	Chazhikattu hall plot	Cinchona officinalis	Quina	Rubiaceae	1
60.	Chazhikattu hall plot	Phyllanthus emblica Emblica officinalis	Indian Gooseberry	Phyllanthaceae	1
61.	Chazhikattu hall plot	Caesalpinia sappan Linn	East Indian redwood	Leguminosae	1
62.	Chazhikattu hall plot	Heliconia rostrata	Hanging lobster Claw	Heliconiaceae	1
63.	Chazhikattu hall plot	Polyalthia longifolia	Aranamaram Indian mast tree	Annonaceae	1
64.	Chazhikattu hall plot	Asparagus officinalis L	Asparagaceae	Golden asparagus	1
65.	Chazhikattu hall plot	Ficus benghalensis	Idian fig (Aal)	Moraceae	1
66.	Chazhikattu hall plot	Citrus limonum Risso	Citrus	Rutaceae	1
67.	Chazhikattu hall plot	Peltophorum roxburghi	Thurumbu maram	Caesalpinaiaceae	1

2.7 Carbon Foot Print Audit

- Petrol used by two wheelers/day–192 L (Per person to and fro 40 kms =1L)
- Fuel used by four wheelers (52 Persons) - 104 L (Per person to and fro 40 kms = 2L)
- Fuel for persons (total 2513 persons) travelling by common transportation = 200 L (4L x 50 persons) Total fossil fuel use is 502 L / day Total fuel cost per day for transportation = Rs 30120/- (502 L x Rs 60)
- Cost of Gas cylinders used Rs. 24000/month (28 cylinders)

- Cost of generator fuel – Rs. 10800/month (6 L per day)
- Amount spent for transportation (office) – Rs. 4000/month (Approx.)
- Amount spent for transportation (canteen) – Rs. 4000/month "
- Amount spent for transportation (visitors) – Rs. 15000/year
- Other expenditures for the energy – Rs. 1467/day

Burning of fossil fuels is the main source and cause of carbon dioxide release to the atmosphere. Carbon dioxide release for the stakeholders to reach the college is very high. It is contributing to the global warming and increasing the pace of climate change. If a College bus is plying for the staff and students carbon dioxide released for the stakeholders' commutation can be reduced. More trees may be planted in the campus to make a source of sink for the carbon dioxide and for other green house gases.

3 Post-Audit stage

3.1 Findings and Observations

Green Audit helps create a greater appreciation and understanding of the impact of College's functioning on the environment. St.Stephen's College Uzahvoor has successfully identified the impacts on environment through various auditing exercises. The Green auditing exercises brainstormed has provided insights on practical ways to reduce negative impact on the environment. Participating in this Green auditing procedure has enabled us to attain knowledge about the need of a Sustainable College Campus. It will create awareness about the use of the Earth's resources in our home, college, local community and beyond. St.Stephen's College should adopt an Environmental Responsible Purchase Policy, and work towards creating and implementing a strategy to reduce the environmental impact of its purchasing decisions.Although twice expensive, LCD monitors are to be purchased instead of CRTs taking into account their efficiency in energy consumption. All computers purchased by the college should have an Energy Star rating, which is a standard requirement for optimal energy usage.

Preparation of action plan

Management policies regarding the College and the approach towards the use of resources need to be considered in purview of Green audit report. An Environment friendly policy formulated by the Management should be followed. Programmes related to Green awareness and environment consciousness should be encouraged among the staff and student community . Based on these policies, the College should have an action plan for which the Green audit report would serve as a foundation.

3.2 Suggestion for Green Campus

Green Audit is the most effective way to identify the strength and weakness of the current sustainable practices. Green Audit provides a professional approach for utilising economic, financial, social and environmental resources in a responsible way. Green audits can "add value" to the Management policies taken up by the College and serves as a platform for identifying, evaluating and managing environmental risks. There is scope for further improvement, particularly in waste management, energy consumption and water conservation. . Even though the College perform fairly well, the recommendations in this report

highlight many a ways in which the College can work to improve its actions and become a more sustainable institution.

Suggestions

Some of the very important suggestions are:-

1. Adopt the proposed Environmental Responsible Purchase Policy, and work towards creating and implementing a strategy, to reduce the environmental impacts.
2. Strengthen and reinforce Environment awareness by making use of resources available at Management, University and Government levels.
3. Groom and cultivate Environment responsible citizens.
4. Practice Institutional Ecology policies pertaining to waste reduction and recycling.
5. Involve All Stakeholders- Expand work with local community and Non-governmental organizations to assist in finding solutions to environmental problems.
6. Collaborate for Interdisciplinary Approaches- Convene University faculty and administrators to develop interdisciplinary approaches especially in curricula. Encourage research initiatives and outreach activities that support an environmentally sustainable future.
7. Adopt the proposed Environmentally Responsible Purchase Policy, and work towards creating a sustainable environment.
8. Increase Reduce, Reuse, and Recycle awareness in Campus.

3.3 Follow up action and Plan

Green Audits generate valuable environment and resource management guidelines. Continuous follow up and assessment on a regular basis is crucial for the accomplishment of Green audit objectives.

Environmental Education

The following environmental education programmes may be implemented in the College before the next Green audit:-

- Training programmes in solid and liquid waste management, setting up of biodiversity garden, medicinal plant nursery, butterfly garden, pollution mitigation methods, and water filtration methods are to be initiated.
- Display of environmental awareness boards such as – Save Water, Save Electricity, No Wastage of food/water, No smoking, Switch off light and fan after use, Plastic free campus'
- Give due importance to Environmental clubs and its programmes.
- Set up a model Rainwater Harvesting system, Vegetable garden, Medicinal plant garden, etc,
- Display various slogans and pictures to protect environment
- Implement chemical treatment system for managing waste water from the laboratories.
- Use coloured waste bins to segregate waste and its easy collection.

4 Recommendations

- Installation of Biogas plant and Compost units with larger capacities
- Installation of rooftop Solar panels of 60KW capacity
- Increase the capacity of Incinerators
- Installation of rain water harvest tank of 1 Lakh liter capacity
- Dig as many rain water pits in the 11 acre campus and maintain it regularly.
- Set up water recycling unit where the recycled water can be used for gardening purpose in college and hostel.
- Grow Vegetable garden and Medicinal garden and gradually develop it as a Nursery.
- Replace 'acacia trees' and 'rubber trees' which is abundant in campus and grow diversity trees to make and let it into a natural laboratory for students, researchers and scholars.
- Display boards of fauna diversity to generate enthusiasm for learners.
- Layout 'Green Chemistry' that reduces or eliminates the use or generation of hazardous substances in the design, manufacture and application of chemical products.
- Install waste water treatment system for Chemistry and Zoology labs.
- Organize eco-friendly programmes
- Conduct exhibitions for parents and public on environment and sustainable practices.
- Arrange training programmes on Environmental Management system and Nature conservation.
- Implement plastic free policy thoroughly.
- Establish an E-waste collection centre in campus.
- Ensure participation of students and teachers in local environmental issues.
- Renovation of cooking system in the canteen to save gas.
- Establish a purchase policy that is energy saving and eco-friendly.
- Replace incandescent and CFL lamps with LED lights.
- Replace LCD computer monitors with LED monitors.
- Conduct seminars, workshops and exhibitions on environmental education.
- Establish water, energy and waste management systems.
- Avoid plastic/thermocol plates and cups in the college level or department level functions.
- Introduce add-on courses eco-friendly income generating to all interested students.
- Encourage students to use cycles.

5 Acknowledgements

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6 Photographs

College - Aerial View

College - Aerial View

Rain Water Harvesting

Rain Water Harvesting

CLEAN TOILETS
KEEP YOUR NOSE OPEN

Pipe Compost

Biogas

Star Garden

Butterfly Garden

Vermi Compost

Solar Panel