

Green Auditing

MES Asmabi College

(Re-accredited by NAAC with A Grade)

P. Vemballur, Kodungallur



CMJ Eco Associates

Forum for Ecological Analyses

2015-2016

Executive Summary

Sustainability is not only spoken in various levels but also practiced by industries, organizations and educational institutes to optimize their resource utilization and make them environment friendly. Hence sustainability is the need of the hour for our country to provide our future generation a clean and safe environment. Educational institutions must play an active role in creating and modeling solution for such environmental problems. Green audit is one such concept or principle introduced to make the educational institutes environmentally sustainable. Through green audit one gets a direction as how to improve the condition of environment within the system.

Green audit can be a useful tool for a college to determine how and where they are consuming more of energy or water or resources; the college can then consider how to implement changes and make savings. It can also be used to determine the type and volume of waste, which can be used for a recycling project or to improve waste minimization plan. Green auditing and the implementation of mitigation measures is a win-win situation for the college, the learners and the planet. It can also create health consciousness and promote environmental awareness, values and ethics. It provides staff and students better understanding of green impact on campus. Green auditing promote financial savings through reduction of resource use. It gives an opportunity for the development of ownership, personal and social responsibility to the students and teachers.

In MES Asmabi, College, P.Vemballur, Kodungallur the audit process involved initial interviews with management to clarify policies, activities, records and the co-operation of staff and student in the implementation of mitigation measures. This was followed by staff and student interviews, collection of

data through the questionnaire, review of records, observation of practices and observable outcomes. In addition, the approach ensured that the management and staff are active participants in the green auditing process in the college.

The baseline data prepared for the MES Asmabi, College, P. Vemballur will be a useful tool for campus greening, resource management, planning of future projects, and a document for implementation of sustainable development of the institution. Existing data will allow the college to compare its programmes and operations with those of peer institutions, identify areas in need of improvement, and prioritize the implementation of future projects. We expect that the management will be committed to implement the green audit recommendations.

We are happy to submit this green audit report to the MES Asmabi College, authorities.

Dr. C.M. Joy,
Honorary Secretary
CMJ Eco Associates,
Forum for Ecological Analyses, Arafa Nagar,
CUSAT P.O., Kochi-22.
9447391905, jcheenikkal@gmail.com

15th April, 2016

Contents

Chapters	Page No
Executive summary	
1. Introduction	1
1.1 Vision and Mission	
1.2 Objectives of the College	
1.3 Total Campus Area & College building Spread Area	
1.4 Previous NAAC Grading	
1.5 Campus Infrastructure	
2. Pre-Audit Stage	6
2.1 Commitment of the College Management	
2.2 Scope and Goals of Green Auditing	
2.3 Benefits of Green Auditing	
2.4 Target Areas of Green Auditing	
2.5 Survey Forms	
3. Audit Stage	23
3.1 Student Groups Involved	
3.2 Student Clubs and Forums	
3.3 Comments on Site Tour	
3.4 Review of Documents and Records	
3.5 Review of Policies	
3.6 Interviews	
3.7 Site Inspection	
4. Post Audit Stage	27
4.1 Key Findings and Observations	
4.2 Evaluation of Audit Findings	
4.3 Suggestions for Green Habits	
4.4 Recommendations / Consolidation of Audit Findings	
4.5 Major Audit Observations	
4.6 Preparation of Action Plan	
4.7 Follow up Action and Plans	
4.8 Environmental Education	
4.9 Conclusion and Recommendations	
5. Exit meeting	45
Acknowledgements	
Photographs	47

Chapter 1

Introduction

MES Asmabi College, established in 1968, a pioneer institution managed by Muslim Educational Society, Calicut, acts as a centre of growth and advancement of the stake holders at Sree Narayana Puram Panchayath of Kodungallur Taluk, a remote coastal village in Thrissur district of Kerala State. The College owes its existence to the remarkable foresight and unremitting zeal of late Dr. P.K.Abdul Gafoor, late P.K. Abdulla and late Dr. A.K Siddiq Karikulam, Azhikode.

The college now caters to the needs of the students throughout Kerala and Lakshadweep, cutting across the barriers of class, caste, creed and religion. Hajee Ismail Essa Sait of Cochin initially donated the land and the building and the college was named after his mother Asmabi.

The college which enjoys 2F and 12 B status of the UGC is affiliated to the Calicut University. At present it provides higher education to about 1650 students in thirteen undergraduate and five Post Graduate Courses. The college was re-accredited by the NAAC at **A** level in September 2012.

1.1 VISION AND MISSION

Institutional Vision

Providing affordable and quality higher education to all especially to the backward and the marginalized people, the Muslims, Scheduled Castes and Scheduled Tribes and empowering of the less-privileged through education and also providing education in tune with national and international standards.

Mission

Empowerment of the downtrodden and backward classes through:

Imparting quality higher education for women

Promotion of secularism, solidarity and
democracy Moral uplift and trust in God

Special care to students from socially and economically backward sectors of
the society

Generating a self-reliant and accountable youth band.

1.2 Objectives of the College

Emphasis on value added education incorporating modern methods
and tools of teaching and learning.

Inculcating social responsibility in student clan by involving them in
community oriented activities.

Infuse eco-consciousness in students and community.

Promote entrepreneurial, leadership, organizational and life skills in
students.

Creating maintaining an atmosphere of oneness among staff, students
and community.

Evolve a student community having academic and professional excellence with a blend of social responsibility.

1.3 Total Campus Area & College Building Spread Area

Campus area	91462 m ²
Built up area	10300 m ²

List of places from where students are coming to the college

The college is 3.5 km west from the Sree Narayanapuram town, 5 km North to Kodungallur through the NH 17 on the way to Guruvayur. The exact location is on the coastal Tippu Sulthan road 7 km from Azhikode near the Kodungallur estuary and this road leads to Chamakkala and Thriprayar beach towards the North. Majority of the students come from Kodungallur, Azhikodu, Moonupeedika, Sree Narayanapuram and Triprayar. Kodungallur is the hub for students and teachers coming from south and southeastern directions of Thrissur and also northern part of Ernakulam district including North Paravur, Kottappuram, Vypin etc. Students are also hailing from Amballur, Irinjalakuda, Guruvayur, Kunnamkulam, Triprayar, Vadanapilly, Chalakudy, Koratty, Mala, and Puthenchira. Students from remote areas such as Thiruvananthapuram, Kollam, Alapuzha, Palakad, Malappuram, Kozhikodu and Wayanad are staying in hostels.

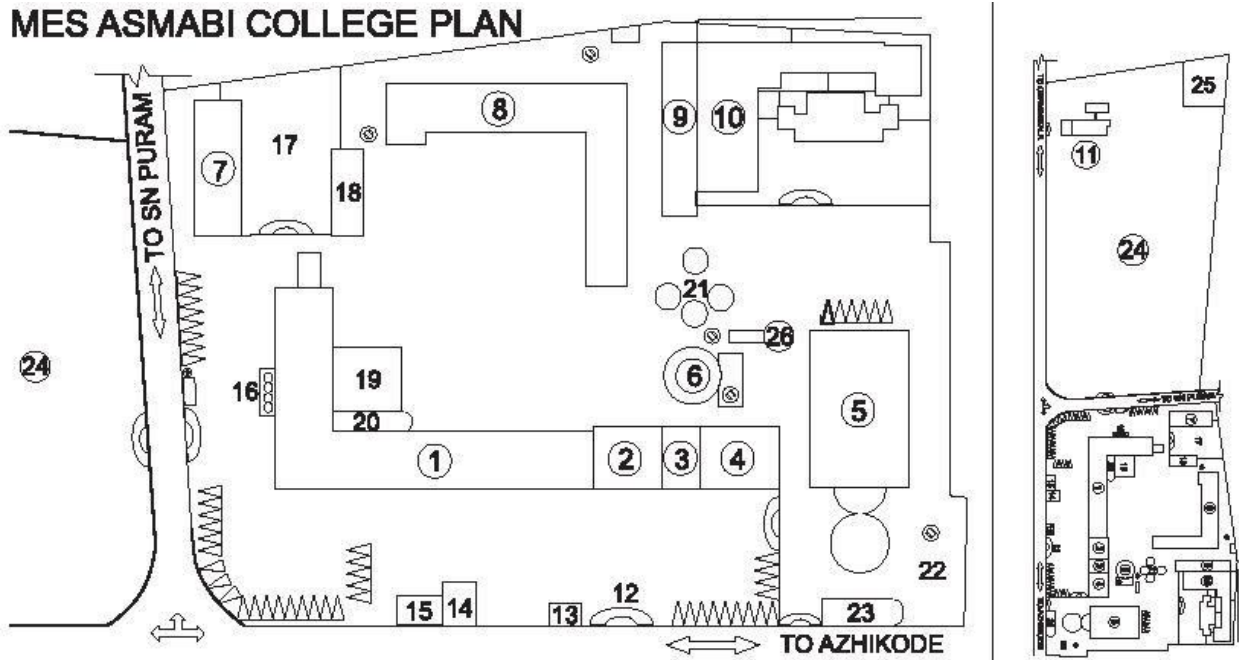
1.4 Previous NAAC Grading

NAAC accreditation **First cycle: B+** in 2004

NAAC re-accreditation: **Second Cycle: A** with CGPA **3.04** in 2012

1.5 Campus Infrastructure

MES ASMABI COLLEGE PLAN



1	MAIN BLOCK	7	COMPUTER BLOCK	12	MAIN ENTRANCE	18	LADIES WAITING ROOM
2	ADMINISTRATIVE BLOCK	8	COMMERCE BLOCK	13	SECURITY CABIN	19	OPEN STAGE
3	SEMINAR HALL	9	BCA BLOCK	14	STORE	20	GREEN HOUSE
4	LIBRARY	10	LADIES HOSTEL	15	ROOM FOR DIFFERENTIALLY ABLED	21	AQUA CULTURE TANKS
6	AUDITORIUM	11	PRINCIPAL QUARTERS + GENTS HOSTEL	16	WATER FILTER UNIT	22	BAMBOO PLANTATION
8	CANTEEN			17	MEDICINEL PLANTS	23	POLY HOUSE

INDEX MAP MAP LEGEND

24	PLAY GROUND
25	GENE POOL CONSERVATION AREA
26	TOILET BLOCK

Campus Facilities

- Well furnished classrooms.
- Smart classrooms
- Well equipped laboratories
- Library & Information Centre (Automated)
- Sky watch Station.
- Campus radio and Media Room
- Public Addressing System.
- Internet Access (Wi-Fi and Wired Broadband)
- Language lab.
- Computer labs with Internet connectivity.
- Campus LAN
- CCTV Surveillance.
- College Bus service.
- Drinking water – points, coolers & filtration system.
- Play Ground

Volley ball and Tennis Courts
Canteen
Kamaru Bai Women's Hostel & Fathima Gafoor Women's
Hostel
Gulshanbi Men's Hostel
Guest rooms
Ladies Retiring Room
Prayer Room
College Co- operative Store
Day Care Centre
Seminar Hall with interactive digital display.
Conference Room
Auditorium
Counseling Centre
Health Centre
Gymnasium -cum-fitness centre.
Aquaria
Alumni Office.
Fish culture tank Complex
Rest room for differently abled students
IQAC room.
NCCroom
NSS Room
Botanical garden
Medicinal plant/Herbal garden.
Vehicle Parking Sheds for Staff and students
High output Diesel generators.
In-campus Transformer.
Fully Computerized Office
Garden and Landscaping.

Chapter 2

Pre-Audit Stage

A pre-audit meeting is an important prerequisite for the green audit because it is the first opportunity to meet the auditee and deal with any concerns. This was held at MES Asmabi, College, P. Vemballur on October 8th 2015. It was an opportunity to gather documents that the audit team can study before arriving on the site. The audit protocol and audit plan was handed over at this meeting and discussed in advance of the audit itself. The meeting provided an opportunity to reinforce the scope and objectives of the audit and discussions were held on the practicalities associated with the audit.

2.1 Commitment of the College Management

The Management of the college has shown the commitment towards the green auditing during the pre-audit meeting. They were ready to encourage all green activities. It was decided to promote all activities that are environment friendly such as awareness programmes on the environment, campus farming, planting more trees on the campus etc., after the green auditing. The management of

the college was willing to formulate policies based on the basis of post-green audit recommendations.

2.2 Scope and Goals of Green Auditing

A clean and healthy environment aids effective learning and provides a conducive learning environment. There are various efforts around the world to address environmental education issues. Green auditing is one among them for the educational institutions. A very simple indigenized system has been devised to monitor the environmental performance of MES Asmabi College, P. Vemballur. It comes with a series of questions to be answered on a regular basis. This innovative scheme is user-friendly and totally voluntary. The aim of this is to help the institution to set environmental examples for the community, and to educate the young learners.

2.3 Benefits of Green Auditing

- ✓ More efficient resource management
- ✓ To create a green campus
- ✓ To enable waste management through reduction of waste generation, solid-waste and water recycling
- ✓ To create plastic free campus and evolve health consciousness among the stakeholders
- ✓ To provide basis for improved sustainability
- ✓ Impart environmental education through systematic environmental management approach and Improving environmental standards
- ✓ Benchmarking for environmental protection initiatives
- ✓ Financial savings through a reduction in resource use

- ✓ Curriculum enrichment through practical experience
- ✓ Development of ownership, personal and social responsibility for the College and its environment
- ✓ Enhancement of college profile
- ✓ Developing an environmental ethic and value systems in youngsters.

2.4 Target Areas of Green Auditing

➤ Auditing for Water Management

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.

➤ Auditing for Energy Management

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.

➤ Auditing for Waste Management

This indicator addresses waste production and disposal, plastic waste, paper waste, food waste, and recycling. Municipal solid waste has a number of adverse environmental impacts, most of which are well known and not in need of elaboration. Solid waste can be divided into two categories: general waste and hazardous waste. General wastes include what is usually thrown away in homes, offices and educational institutions such as garbage, paper, tins and glass

bottles. Hazardous waste is waste that is likely to be a threat to health or the environment like cleaning chemicals and liquid fuels.

Unscientific landfills may contain harmful contaminants that leach into soil and water supplies, and produce greenhouse gases contributing to global climate change. Furthermore, 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 to a sustainable college.

❖ **Hazardous Materials**

This indicator addresses hazardous wastes of laboratories, medical waste, art supplies, and chemicals used in campus maintenance. Hazardous materials represent significant risks to human health and ecological integrity. They often persist in the environment leaving a legacy of land and water contamination for generations. Many 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.

➤ **Auditing for Green Campus Management**

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 healthy ecosystems and ultimately 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.

Trees of life: The trees work hard to keep the air we breathe clean and healthy. They are like sponges. Their leaves take in carbon dioxide in the air, and replace it with the oxygen we need for healthy living. This system of absorbing gases on which all plants rely for their food is called photosynthesis. In this, 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 cannot 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. If this is washed, blown or worn away leaving rock or sand on which no plants can grow then the earth would become a desert. The removal of this top-soil is called soil erosion. Scientists, all over the world are trying to find ways to prevent soil erosion. One of the most important ways of combating erosion is planting more trees.

Trees send up water vapour into the atmosphere through their leaves. When this vapour meets the cool air above it turns into drops of water which then fall as rain. They give us beauty, colour and greenery. This is something which we often forget and fail to appreciate. They are the homes of many birds, animals and insects. Each of these is important in maintaining the balance of nature.

They give us food, and juice to drink (think how many fruits we eat). Ropes, medicines, wood, paper, and so many other things we use in our daily life, or which are necessary for our health, are made from trees.

➤ **Auditing for Carbon Footprint**

How we get around, and to and fro from college each day 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 carbon dioxide, 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.

The above target areas particular to the college was evaluated through questionnaire circulated to the students for data collection. Five categories of questionnaires were distributed. The formats of these are given below.

2.5 Survey Forms

I

Green Auditing @ MES Asmabi, College, P Vemballur

Auditing for Water Management

1. List uses of water in your college.
2. What are the sources of water in your college?

3. How many wells are there in your college?
4. No. of motors used for pumping water from each well?
5. What is the total horse power of each motor?
6. What is the depth of each well?
7. What is the present depth of water in each well?
8. How does your college store water?
9. Quantity of water stored in your overhead water tank? (in liters)
10. Quantity of water pumped every day? (in liters)
11. If there is water wastage, specify why.
12. How can the wastage be prevented / stopped?
13. Locate the point of entry of water and point of exit of waste water in your College.
14. Where does waste water come from?
15. Where does the waste water go?
16. What are the uses of waste water in your college?
17. What happens to the water used in your labs? Whether it is mixing with ground water?
18. Is there any treatment for the lab water?
19. Whether your labs are practicing green chemistry methods?
20. Write down four ways that could reduce the amount of water used in your college.
21. Record water use from the college water meter for six months.
22. Bimonthly water charges paid to water connections if any
23. No. of water coolers. Amount of water used per day? (in liters)
24. No. of water taps. Amount of water used per day?
25. No. of bath rooms in staff rooms, common, hostels.
Amount of water used per day?
26. No. of toilet, urinals. Amount of water used per day?
27. No. of water taps in the canteen. Amount of water used per day?

28. Amount of water used per day for garden use.
29. No. of water taps in laboratories. Amount of water used per day in each lab?
30. Total use of water in each hostel?
31. At the end of the period, compile a table to show how many litres of water have been used in the college for each purpose
32. Is there any water used for agricultural purposes?
33. Does your college harvest rain water?
34. If yes, how many rain water harvesting units are there? (Approx. amount)
35. How many of the taps are leaky? Amount of water lost per day?
36. Are there signs reminding people to turn off the water? ___ Yes ___ No day?(Approx)
37. Is there any waterless toilets? _____
38. How many water fountains are there? _____
39. How many water fountains are leaky? _____
40. Is drip irrigation used to water plants outside? ___ YES ___ NO
41. How often is the garden watered?
42. Amount of water used to watering the ground?
43. Amount of water used for bus cleaning? (liters per day)
44. Amount of water for other uses? (items not mentioned above)
45. Area of the college land without tree/building canopy.
46. Is there any water management plan for the college?
47. Are there any water saving techniques followed in your college?
What are they?
48. Please share some IDEA for how your college could save more water.

II

Green auditing @ MES Asmabi, College, P. Vemballur

Auditing for Energy Management

1. List ways that you use energy in your college. (Electricity, electric stove, kettle, microwave, LPG, firewood, Petrol, diesel and others).
2. Electricity bill amount for last one year
3. Amount paid for LPG cylinders for last one year
4. Weight of firewood used per month and amount of money spent? Also mention the amount spent for petrol/diesel/ others for generators?
5. Are there any energy saving methods employed in your college? If yes, please specify. If no, suggest some.
6. How much money does your college spend on energy such as electricity, gas, firewood, etc. in a month. (Record monthly for the year 2016).
7. How many CFL bulbs has your college installed? Mentions use (Hours used/day for how many days in a month)
8. What is the energy used by each bulb per month? (for example- 60 watt bulb x 4hours x number of bulbs = kWh).
9. How many LED bulbs has your college installed? Mention use (Hours used/day for how many days in a month)
10. Energy used by each bulb per month? (kwh).
11. How many incandescent (tungsten) bulbs has your college installed? Mentions use (Hours used/day for how many days in a month)
12. Energy used by each bulb per month? (kwh).
13. How many fan has your college installed? Mention use (Hours used/day for how many days in a month)
14. Energy used by each fan per month? (kwh)
15. How many air conditioner has your college installed? Mention use (Hours used/day for how many days in a month)
16. Energy used by each air conditioner per month? (kwh).

17. How many electrical equipment including weighting balance has your college installed? Mentions use (Hours used/day for how many days in a month)
18. Energy used by each electrical equipment per month? (kwh).
19. How many computer has your college installed? Mention use (Hours used/day for how many days in a month)
20. Energy used by each computer per month? (kwh)
21. How many photocopier has your college installed? Mention use (Hours used/day for how many days in a month).
22. How many cooling apparatus has your college installed? Mention use (Hours used/day for how many days in a month)
23. Energy used by each cooling apparatus per month? (kwh) Mention use (Hours used/day for how many days in a month)
24. Energy used by each photocopier per month? (kwh) Mention use (Hours used/day for how many days in a month)ow many inverters your college installed? Mention use (Hours used/day for how many days in a month) Energy used by each inverter per month? (kwh)
25. How many electrical equipment used in different labs of your college ? Mention use (Hours used/day for how many days in a month)
26. Energy used by each equipment per month? (kwh)
27. How many heaters used in the canteen of your college ? Mention use (Hours used/day for how many days in a month)
28. Energy used by each heater per month? (kwh)
29. No of street lights in your college?
30. Energy used by each street light per month? (kwh)
31. No of TV in your college and hostels?
32. Energy used by each TV per month? (kwh)
33. Any other item that uses energy (Please write the energy used per month) Mention use (Hours used/day for how many days in a month)

34. Are any alternative energy sources/nonconventional energy sources employed / installed in your college? (photovoltaic cells for solar energy, windmill, energy efficient stoves, etc.,) Specify.
35. Do you run "switch off" drills at college?
36. Are your computers and other equipment put on power-saving mode?
37. Does your machinery (TV, AC, Computer, weighing balance, printers, etc.) run on stand by modes most of the time? If yes, how many hours?
40. What are the energy conservation methods adapted by your college?
- 41 How many boards displayed for saving energy awareness?
- 42 How much ash collected after burning fire wood per day in the canteen?
- 43 Write a note on the methods/practices/adaptations by which you can reduce the energy use in your college campus in future.

Calculation of energy for electrical appliances

Appliance	Power used in (watt)	Usage per day (hours)	Number of appliances	Average kWh per day (Watt X hours X Number / 1000)	Average kWh per month (Watt X hours X Number X 30)
Incandescent bulb	60 watt				
CFL	18 W				
Microwave	1000W				
Stove	3000W				
Kettle	2500W				

III

Green auditing @ MES Asmabi, College, P. Vemballur

Auditing for Waste Management

What is the total strength of students, teachers and Non teaching staff in your College?

	<u>No. of Students</u>	<u>No. of Teachers</u>	<u>No. Non teaching staff</u>
Gents			
Ladies			
Total			

Which of the following are available in your College? Give area occupied and number

Garden area	Garbage dump (number)
Play ground area	Laboratory
Kitchen	Canteen
Toilets (number)	Car/scooter shed area
Number of class rooms	Office rooms
	Others (specify)

Which of the following are found near your college?

Mark the level of disturbance it creates for the college in a scale of 1 to 9.

Municipal dump yard

Garbage heap

Public convenience

Sewer line

Stagnant water

Open drainage

Industry – (Mention the type)

Bus / Railway station

Market / Shopping complex / Public halls

WASTE

Does your college generate any waste?

If so, what are they? How much quantity? Number or

weight E-waste

Hazardous waste (toxic)

Solid waste

Dry leaves

Canteen waste

Liquid waste

Glass

Unused equipment

Medical waste if any

Napkins

Others (Specify)

Is there any waste treatment system in the college?

Is there any treatment for toilet/urinal/sanitary napkin waste?

1. What is the approximate amount of waste generated per day? (in Kilograms)

(approx.)

Office

Approx	Bio degradable	Non-Bio degradable	Hazardous	Others
< 1 kg.				
2 - 10 kg				
> 10 kg.				

Laboratories

Approx	Bio degradable	Non-Bio degradable	Hazardous	Others
< 1 kg.				
2 - 10 kg				
> 10 kg.				

Canteen/kitchen

Approx	Bio degradable	Non-Bio degradable	Hazardous	Others
< 1 kg.				
2- 10 kg.				
> 10 kg.				

2. Why waste is a problem?
3. Whether waste is polluting ground/surface water? How?
4. Whether waste is polluting the air of the college? How?
5. How is the waste generated in the college managed? Methods a.

Composting

b. Recycling

c. Reusing

d. Others (specify)

6. How many separate boxes do you think you would need to put into a classroom to start a waste segregation and recycling campaign?
What would each be used for? (Develop a colour code with reasons)
7. Do you use recycled paper in College?
8. Is there any waste wealth programme practiced in the college?
9. How would you spread the message of recycling to others in the community?
Have you taken any initiatives? If yes, please specify.
10. Can you achieve zero garbage in your college? (Reduce ,Recycle, Reuse, Refuse) If yes, how?

IV

Green auditing @ MES Asmabi, College, P. Vemballur

Auditing For Green Campus Management

1. Is there a garden in your college? 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. Whether you are 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 any 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 are you doing with the vegetables harvested? Do you have any student market?
18. Is there any botanical garden in your campus? If yes give the details of campus flora.
19. Name number and names of the medicinal plants in your college campus.
20. 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. Are there any fruit yielding plants in your college? If yes details of the trees planted.
24. Is there any grove 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? (2014-15)
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/suggestions for further improvement of green cover.

V

Green auditing @ MES Asmabi, College, P. Vemballur

Auditing for Carbon Footprint

1. What is the total strength of students and teachers in your College?
No. of Students No. of Teachers No. of Non teaching staff
Gents
Ladies
Total
2. Total Number of vehicles used by the stakeholders of the college. (per day)
3. No. of cycles used
4. No. of two wheelers used (average distance travelled and quantity of fuel and amount used per day)
5. No. of cars used (average distance travelled and quantity of fuel and amount used per day)
6. No. persons using common (public) transportation (average distance travelled and quantity of fuel and amount used per day)
7. No. of persons using college conveyance by the students, nonteaching Staff and teachers (average distance travelled and quantity of fuel and amount used per day)
8. Number of parent-teacher meetings in an year? Parent turn out(approx)

9. Number of visitors with vehicles per day?
10. Number of generators used every day (hours). Give the amount of fuel used per day.
11. Number of LPG cylinders used in the canteen (Give the amount of fuel used per day and amount spent).
12. Quantity of kerosene used in the canteen/labs (Give the amount of fuel used per day and amount spent).
13. Amount of taxi/auto charges paid and the amount of fuel used per month for the transportation of vegetables and other materials to canteen.
14. Amount of taxi/auto charges paid per month for the transportation of office goods to the college.
15. Average amount of taxi/auto charges paid per month by the stakeholders of the college.
16. Use of any other fossil fuels in the college (Give the amount of fuel used per day and amount spent).
17. Suggest the methods to reduce the amount of use of fuel by the stakeholders/students/teachers/non teaching staff of the college.

Chapter 3

Audit Stage

Green auditing was done by CMJ eco-associates involving different student groups & teaching and non-teaching staff. The green audit began with the teams walking 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 their impacts. The staff and learners were interviewed to get details of usage, frequency or general characteristics of certain appliances. Data collection were done in the sectors such as Energy, Waste, Greening, Carbon footprint and Water use. College records and documents were verified several times to clarify the data received through survey and discussions. The whole process was completed within five months from 2015 October to February, 2016.

3.1 Student Groups Involved

Student Participants

Sl.No	Name of the Student	Class
1.	Mohammed Safvan V.K.	1 st Bsc Botany
2.	Thasni T.M.	1 st Bsc Botany

MES Asmabi College, P. Vemballur

3.	Aliya N.K.	1 st Bsc Botany
4.	Hasni C.S.	1 st Bsc Botany
5.	Siddarth S. Kumar	1 st Bsc Botany
6.	Shahina	1 st Bsc Botany
7.	Famitha Ubaid	1 st Bsc Botany
8.	Jinesh M.	2 nd Bsc Botany
9.	Roshan Ahmad	1 st BSc Aquaculture
10.	Biji Baby	1 st BSc Aquaculture
11.	Arun S. Surendran	1 st BSc Aquaculture
12.	Akshay Krishna P.	1 st BSc Aquaculture
13.	Hafseena	1 st BSc Aquaculture
14.	Zerin zakir	2 nd BSc Aquaculture
15.	Abdul Basith	1 st BSc Aquaculture
16.	Shifa Mol	2 nd BA Economics
17.	Suneera P.S.	2 nd BA Economics
18.	Faseela V.U.	2 nd BA Economics
19.	Salsabeela M.	2 nd BA Economics
20.	Hajila Haneef	1 st BSc Physics
21.	Raheela N.M.	1 st BSc Physics
22.	Afrin Faizal	1 st BSc Physics
23.	Nikhil M.S.	1 st BSc Physics
24.	Vaseela	2 BSc Physics
25.	Clince Jose	1 st BSc Physics
26.	Thehsina Ibrahim	2 nd BSc Physics
27.	Kasthuri N.M.	2 nd BSc Physics
28.	Muneera M.A.	1 st BSc Physics
29.	Anjitha V.S.	1 st BSc Physics
30.	Thanas	1 st BSc Physics
31.	Muhammed Vidad	1 st BSc Physics
32.	Athul K.A.	1 st BCom - Cooperation
33.	Sneha Thomas	1 st BCom - Cooperation
34.	Anjali C.K.	2 nd BCom CA
35.	Sajid	2 nd BCom CA
36.	Nelli V.C.	1 st BCom CA
37.	Sivaprasad V.R.	1 st BCom CA
38.	Rimalsha	1 st BCom CA

39.	Adam Muhammed	1 st BCom CA
40.	Shabas	2 nd BCom CA
41.	Abhirami P.S.	2 nd BCom CA
42.	Mubeena	2 nd BA English
43.	Tincy A.J.	2 nd BA English
44.	Salma Shirin	2 nd BA English
45.	Faseela K.S.	1 st BA English
46.	Gopika M.V.	1 st BA English
47.	Ranjitha P.	2 nd BSc Botany
48.	Asna O.	1 st BA Mass Communication
49.	Azeem Salih	2 nd BA Mass Communication
50.	Sangeeth P.S.	2 nd BSc Maths
51.	Anaya Johnson	2 nd BSc Maths
52.	Rahim	2 nd BSc Maths

3.2 Student Clubs and Forums

Nature Club, Tourism Club, Bhoomithrasena Club, NSS, NCC, Health club, Folklore club, Debate club, Quiz club, Legal club, Literacy club, Readers forum, Red cross and Department level associations

3.3 Comments on Site Tour

Site inspection was done along with students and staff. It was quite interesting and fascinating. It served also as an environmental awareness program for the students who participated in the green auditing. The experience of green auditing was first of its kind for most of the students. They have shared their expectations about a green campus and gave suggestions for the audit recommendations.

3.4 Review of Documents and Records

Documents such as admission registers, registers of electricity and water charge remittance, furniture register, laboratory equipment registers, purchase register, audited statements, and office registers were examined and data were collected. College calendars, college magazines, annual report of the college and NAAC self-assessment reports, UGC report etc. were also verified as part of data collection.

3.5 Review of Policies

Discussions were made with the college management regarding their policies on environmental management. Future plans of the college were also discussed.

3.6 Interviews

In order to collect information for green auditing different audit groups interviewed office staff, Principal, Teaching and non-teaching staff, students, parents and other stakeholders of the college. Discussions were also made with the PTA office bearers to clarify doubts regarding certain points.

3.7 Site Inspection

College and its premises were visited and analyzed by the audit-teams several times to gather information. Campus trees were counted and identified, vegetable garden, play grounds, canteen, library, office rooms and parking grounds were also visited to collect data.

Chapter 4

Post Audit Stage

4.1 Key Findings and Observations

a) Water

- ❖ Water uses different
- ❖ No water treatment system in place.
- ❖ Water cooler with drinking water filtration is installed (4 numbers).
- ❖ Number of urinals and toilets – 94
- ❖ No waterless urinals
- ❖ Number of bathrooms – 70
- ❖ Number of water taps – 202 (a few are leaky)
- ❖ Number of wells – 6 tube wells
- ❖ Quantity of water pumped – 15000-20000 liters/day
- ❖ Water charges paid – Rs.11837/Bimonthly
- ❖ Water use in the college – 20000 liters/day
- ❖ Water use in hostels – 30300 liters/day (total-50300 liters)

b) Energy

- ❖ Electricity charges Rs.24069/month
- ❖ Cost of Gas cylinders used Rs. 2100/month
- ❖ Cost of generator fuel – Rs.3000/month
- ❖ Number of CFL bulbs – 41
- ❖ Number of LED bulbs - 60
- ❖ Number of incandescent bulbs – 18
- ❖ Fans – 185 (Including in the college hostel)
- ❖ Air conditioners – 6
- ❖ Computers – 82
- ❖ Water pumps – 6 (1.5 kwh each)
- ❖ Tubes – 120
- ❖ Photocopiers – 6
- ❖ Printers – 22
- ❖ Water coolers – 4
- ❖ LCD projectors – 20
- ❖ Televisions – 9
- ❖ Number of power inverters – 10
- ❖ Number of water heaters – 1

Laboratory Equipments and their energy consumption

SL/NO	NAME OF THE EQUIPMENT	WATTS/VOLTS	TIME hour /Month
1	HOT AIR OVEN	1000W	15 h
2	HOT PLATE	1500 W	5 h
3	pH METER	200 w	8 h

4	Electro photometer	200 w	10 h
5	CENTRIFUGE	1/8W	25 h
6	MAGNETIC STIRRER	200w	10 h
7	ELECTRONIC BALANCE	100 w	5 h
8	LAMINAR AIR FLOW CABINET	200W	2 h
9	TISSUE CULTURE RACK	250 w	3 h
10	ROTARY SHAKER	10W	10 h
11	REFRIGERATOR	390 w	500 h
12	ELECTRONIC MICROSCOPE	200 w	30 h
13	WATER BATH	230V	20 h
14	HEATING MANTLE	200W	30 h
15	MONO QUARTZ DISTILLATION UNIT	300 W	5 h
16	Autoclave	1000W	8h

c) Waste

- ❖ Total Stakeholders – 1726
- ❖ Class rooms – 60
- ❖ Other rooms – 21

- ❖ E-wastes- computers, electrical and electronic parts – Disposal by selling
- ❖ Plastic waste- disposal by selling
- ❖ Solid wastes – Damaged furniture, paper waste, paper plates, food wastes – to Municipal waste collection centres
- ❖ Chemical wastes – Laboratory waste
- ❖ Waste water – washing, urinals, bathrooms in soak pits
- ❖ Glass waste – Broken glassware from the labs
- ❖ Waste treatments – biogas plant and compost system
- ❖ Napkin incinerators - 3

Quantity of Waste Generated:-

- ❖ Bio degradable – 2 kg/day (office)
- ❖ Non bio degradable – 1 kg/day (office)
- ❖ Bio degradable – 1 kg/day (labs)
- ❖ Non-bio-degradable – ½ kg/day (labs)
- ❖ Hazardous waste –100 gm/day

Canteen Waste

- ❖ Biodegradable college canteen – 10kg/day
- ❖ Non-biodegradable – ½ kg/day
- ❖ Hostel mess waste – Bio degradable – 10 kg/day

d) Green Campus

Total number of plant species identified - 137

LIST OF CAMPUS TREES IDENTIFIED IN THE COLLEGE CAMPUS

1. *Artocarpus heterophyllus* 12
2. *Artocarpus hirsutus* 6

3. <i>Couroupita guianensis</i>	1
4. <i>Ficus sp</i>	1
5. <i>Syzygium cumin</i>	6
6. <i>Phyllanthus emblica</i>	7
8. <i>Casuarina litorea</i>	23
9. <i>Magnolia champaca</i>	3
10. <i>Terminalia bellirica</i>	3
11. <i>Anacardium occidentale</i>	11
12. <i>Auracharia sps</i>	2
13. <i>Zamia sps</i>	2
14. <i>Cycas circinalis</i>	2
15. <i>Tecoma stans</i>	4
16. <i>Hamelia patens</i>	2
17. <i>Samanea saman</i>	6
18. <i>Delonix regia</i>	3
19. <i>Caesalpinia coriaria</i>	4
20. <i>Albizia chinensis</i>	3
21. <i>Eucalyptus tereticornis</i>	3
22. <i>Mangifera indica</i>	7
23. <i>Cycas revoluta</i>	3
24. <i>Pouteria campechiana</i>	2
25. <i>Polyalthia longifolia</i>	7
26. <i>Alstonia scholaris</i>	1
27. <i>Guava</i>	5
28. <i>Swietenia mahagani</i>	4
29. <i>Vitex negundo</i>	1
30 <i>Vitex altissima</i>	3

Species planted and protected by the Students

1. *Artocarpus heterophyllus*, 6
2. *Artocarpus hirsutus* 3
3. *Couroupita guianensis* 1
4. *Ficus sp* 1
5. *Syzygium cumin* 4
6. *Phyllanthus emblica* 3
7. *Magnolia champaca* 3
8. *Terminalia bellirica* 1
9. *Mangifera indica* 4
10. *Polyalthia longifolia* 3
11. *Swietenia mahagoni* 4
- 12 *Caesalpinea corearea* 2

Crops cultivated in the campus

Tapioca, Banana, Cabbage, Cauliflower, Capsicum, Tomato, Yam, Colocasia, legume

e) Carbon Footprint

No. persons using cycles – 27

No. persons using cars – 19

No. persons uses two wheelers – 111

Persons using other transportations – 1140

No. visitors per day – 12

No. Students staying in the hostel - 80

Average distance travelled by stake holders – 20 kms/day

Expenditure for transportation per person per day – Rs.30/-

4.2 Evaluation of Audit Findings

Water

Water audit at MES Asmabi, College, P. Vemballur					
1	2	3	4	5	6
Activity	Average use per activity (litres)	Number of activity /day	water use/ person / day (litres)	Number of persons using water	Total water consumption / day
<i>Washing hands and face</i>	1L	3 times a day	1 x 3 = 3L	1900	5700 L
Bath	10-30	twice	20L	200	4000L
Toilet flush	6-20	once	10L	1500	15000L
Drinking (cup)	0.25	twice	0.5L	1900	950L
Washing dishes	5	twice	5L	1500	7500
Leaking/dripping tap (1 drop/ second /day)	30-60	continuous	50	A few taps	250L
garden use	4	once			10000L
Cooking (average)	3	once	3	1000	3000
Bus wash					1000L
lab uses	2	5	3L	1000	3000
Total water use					50300L/day

50300 liters of water is used per day by the college for its different uses. The main source of water is ground water. Water from the public water supply is also utilized. 250 L of water per day is lost through the leaking of pipes. This can be prevented and other sources of water may be identified. If water treatment system is installed at canteen and chemical laboratories the amount of water lost through outlets can be recycled. A major preference to the recycling of water may be adopted in the college for an efficient water management. Awareness programs for the management of sustainable water use will be highly beneficial in this college.

Energy

Electric Appliance Audit Sheet of MES Asmabi College, P.Vemballur					
1	2	3	4	5	6
Appliance	Power use (Watt)	Usage per day (hours)	Number of appliances	Average kWh per day (watt x hours x no/1000)	Average kWh per month
light bulb Incandescent	40	10	18	7.2	216
Light bulb CFL	15	7	41	4.3	129
LED bulb	5	7	60	2.1	63
Photocopier	1000	6	6	36	1080
Fan	75	8	185	111	3330
AC	1000	14	6	84	2520
Computers	350	6	82	172	5166

MES Asmabi College, P. Vemballur

Water pump	2625	2	6	31.5	945
Tubes	40	10	120	48	1440
Printers	260	2	22	11.4	343
Water filter	20	24	4	1.9	57.6
LCD Projector	300	2	20	12	360
Hot air oven	10000W	15	1	15	4500
HOT PLATE	1500 W	5	1	7.5	225
PH METER	200	5	1	1.0	30
ELECTRO PHOTOMETER	200	10	1	2.0	60
CENTRIFUGE	1/8W	25	1	0.003	0.09
MAGNETIC STIRRER	200	10	1	2	60
ELECTRONIC BALANCE	100	5	1	0.5	15
LAMINAR AIR FLOW CABINET	200	2	1	0.4	12
TISSUE CULTURE RACK	250	3	1	0.75	22.5
ROTARY SHAKER	10	10	1	0.1	3
REFRIGERATOR	390	10	1	3.9	117
BINOCULAR MICROSCOPE	200	30	1	6	180
WATER BATH	1000	20	1	20	600

HEATING MANTLE	200	30	1	6	180
MONO QUARTZ DISTILLATION UNIT	300	5	1	1.5	45
TELEVISION	140	5	9	6.5	196
INVERTERS	250	24	10	60	1800
Autoclave	1000	8	1	8	2400
Total energy consumption				26100 kWh/Month	

The total energy utilization of the college for different purposes is approximately **26100 kWh/month**. A hybrid source of energy comprising solar and wind type of non-conventional category of energy will be a good energy management system for the college. Electricity charges per month are **Rs.24069/month**. Energy saving through the replacement of incandescent bulbs to LED light could be a good option. Awareness programs for the stakeholders to save energy may also increase sustainability in the utilization of various energy source.

Waste

Total Biodegradable waste = 23 kg/day
 Non-biodegradable waste = 2 kg/day
 Hazardous wastes = 100grams/day

A composting pit is highly essential for the treatment of bio degradable waste generated from the canteen, office, vegetable garden and from the college campus cleaning operations. Different methods such as pit composting, vermi-composting, bacterial composting using bacterial consortium, may be used to treat the bio degradable waste. Hazardous waste generated from the college can

be collected properly and may be handed over to the local self-governments treatment yards. Bottles, plastics, cans, broken glass wares, tins etc., may be recycled or sold out.

Green Campus

Total area for cultivation: -

Farming area in the college - 2 ½ cents

Campus under tree cover –100 m²

The campus has 137 species of trees. This provide ample surface for greening initiatives. The tree populations of the campus comprise the following species.

There is enough space to set up a garden in the college. A model arboretum will be ideal for the college. At least 100 different types of trees can be planted in the campus. An area may be demarcated for the establishment of a garden of medicinal plants, paddy field and vegetable garden. It is better to reduce the area for rubber cultivation because the rubber plants absorb more water from the ground water resource subjecting the area highly drought prone.

Carbon Footprint

Petrol used by two wheelers/day - 111 L(Per person to and fro 40 kms=1L)

Fuel used by four wheelers (19 Persons) - 38 L (Per person to and fro 40 kms=2L)

Fuel for persons (total 1140 persons) travelling by common transportation =13 L

Total fossil fuel use is 162 L / day

Amount spent for LPG – 2100/month

Amount spent for generator fuel – 3000/month

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 more College buses are plying for the staff and students carbon dioxide released for the stakeholders 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.

List of nature protection initiatives of the campus

- i. Adoption of Wetland (Thazhamchira Wetland Puthenvelikkara), flood plain of Chalakkudy River, and Sacred Grove (Sankukulangara Kavu SN Puram) for conservation activities and study jointly by NSS and the PG Department of Botany.
- ii. Supply of seedlings to nearby home gardens and monitoring by Botany Department
- iii. Energy and waste management awareness programmes by NSS and Botany Department
- iv. Survey on Pokkali farming and Periyar pollution by NSS units of the college.
- v. Anti plastic campaign and training to make paper bags jointly by NSS units, Botany and Mathematics departments.
- vi. Planting trees along coastal areas by NSS, Malayalam and Botany departments.
- vii. Cleaning of wells by NSS volunteers.
- viii. Cleaning of public ponds jointly by NSS, Botany and Mathematics departments.
- ix. Supporting Plantation labor, tribal community in paper/cloth bag making, supporting their livelihood and declaration of plastic carry bag free zone in Malakkappara and Athirapilly tourist zone.

List of ongoing eco friendly activities in the campus

- I. Proper waste segregation – separate waste collection eco bins at in class rooms, corridors etc.
- II. Flex and other plastic based displays banned.
- III. Disposable glasses not allowed.
- IV. Promotion of Ink pen and reusable refill pens
- V. Conservation of campus flora
- VI. Reuse of paper
- VII. Promotion of public transport
- VIII. Promotion of agriculture
- IX. Encouraging softcopy submission of assignments – paper conservation
- X. Use steel and other containers instead of disposables and its is supplied in the canteen
- XI. Separate bins for collection of plastic and paper (Eco Bins) in every class room, every corridors, every common places and are collected and segregated in the segregation room
- XII. e waste are segregated in the segregation room

4.3 Suggestions for Green Habits

Create more space for planting.

Grow potted plants at both verandah and class rooms.

Create automatic drip irrigation system during summer holidays.

Supporting on-campus gardens and greenhouses

Installation of composting facilities on campus

Increasing local and organic food options in campus dining halls

Collecting rain water for watering purpose of gardens

Not just celebrating environment day but making it a daily habit.

Beautifying the entire campus with indoor plants

Providing funds to nature club for making campus more green
Encouraging students not just through words, but through action for making the campus green
Conducting competitions among departments for making students more interested in making the campus green.

4.4 Recommendations/Consolidation of Audit Findings

The college has taken a number of positive steps to reduce its environmental impacts. But many areas remain in which substantial improvements can be made. The eco friendly initiatives of the college are appreciable and can be considered as model initiatives for other educational institutions.

We hope that you would have developed a greater appreciation and understanding of the impact of your actions on the environment through this green auditing processes. You have been able to successfully determine your impacts on the environment through the various auditing exercises. The green auditing exercise has brainstormed and implemented practical ways to reduce your negative impact on the environment. Participating in this green auditing procedure you have gained knowledge about the need of sustainability of the college campus. It will create awareness around the use of the Earth's resources in your home, college, local community and beyond.

4.5 Major Audit Observations

- There is a lack of establishing an environmental policy statement indicating the commitment of the college towards its environmental performance.
- Plantation inside the college premises is found well maintained.

- Use of notice boards and signs are inadequate to reduce over exploitation of natural resources.
- Model solid waste management systems are lacking.
- Implementations of sustainable projects to attain set environmental goals are not in place.
- The communication process for awareness in relation to energy conservation found inadequate.
- Objectives for reducing energy, water and fuel consumptions are meager.
- High energy consuming incandescent lights and fluorescent lights are found in use.
- College has not yet taken any initiative for carbon accounting.
- The college does not have waste water treatment for waste water generated from laboratories, canteen, Hostel kitchen, toilets, bathrooms and office rooms.
- The waste water from canteen and kitchens are not suitably controlled and are not used for gardening.
- Tree cover of the college with respect to the stakeholder strength is not enough.

4.6 Preparation of Action Plan

Policies referring to your College's management of, and approach towards the use of resources need to be considered. An environmental policy should be formulated by the management of the college. Where there are policies they need to be listed as part of your analysis documentation. The college should have a policy on awareness raising or training programs (for ground staff or kitchen staff for example) and college also should have a procurement policy (the College's policy for purchasing materials). Based on the policies college

should have an action plan. The green auditing report will be a base line for the action plan to be evolved.

4.7 Follow Up Action and Plans

Green Audits are exercises which generate considerable quantities of valuable management information. The time and effort and cost involved in this exercise is often considerable and in order to be able to justify this expenditure, it is important to ensure that the findings and recommendations of the audit are considered at the correct level within the organisation and that the action plans and implementation programs result from the findings.

Audit follow up is part of the wider process of continuous improvement. Without follow-up, the audit becomes an isolated event which soon becomes forgotten in the pressures of organisational priorities and the passing of time.

4.8 Environmental Education

The following environmental education programs may be implemented in the college before the next green auditing: -

Training programs in solid waste management, liquid waste management, setting up of medicinal plant nursery, water management, vegetable cultivation, paddy cultivation, tree planting, energy management, landscape management, pollution monitoring methods, and water filtration methods. 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 etc.

- ❖ Activate the environmental clubs

- ❖ Set up model rainwater harvesting system, vegetable garden, medicinal plant garden, paddy fields etc.
- ❖ Conduct exhibition of recyclable products
- ❖ Display various slogans to protect environment
- ❖ Implement chemical treatment system for waste water from the laboratories.

4.9 Conclusion and Recommendations

Green audits can “add value” to the management approaches being taken by the college and is a way of identifying, evaluating and managing environmental risks (known and unknown). The green audit reports assist in the process of attaining an eco friendly approach to the development of the college. Hope that the results presented in the green auditing report will serve as a guide for educating the college community on the existing environment related practices and resource usage at the college as well as spawn new activities and innovative practices.

List of Recommendations

1. Installation of biogas plant and compost units
2. Solar panels should be installed to generate electricity
3. Planting of 50 trees/year in the campus
4. Set up model vegetable and medicinal plant gardens
5. Purchase of more college buses
6. Reduce the number of water taps and set up recycling of waste water.
Install waste water treatment system for effluents of laboratories.
7. Set up efficient water recycling system in the college canteen
8. Install rain water harvesting system
9. Use green chemistry as far as possible in the chemical labs

10. Organize 'earn while learn' eco-friendly programs
11. Arrange more training programs on environmental management system and nature conservation
12. Tap wind energy through wind mill.
13. Declare the campus plastic free and organize awareness programs to make the campus plastic free
15. Adopt an environment policy for the college
16. Establish a e-waste collection centre
17. Ensure participation of students and teachers in local environmental issues
18. Renovation of cooking system in the canteen to save gas
19. Establish a purchase policy for environment friendly materials
20. Replace incandescent lamps with LED lights
21. Replace old computers with LED monitors
22. Conduct seminars and workshops on environmental education
23. Establish water, waste and energy management systems
24. Avoid plastic plates and plastic items in the college functions
25. Set up a nursery for plants to be distributed to the students
26. The College needs to develop a monitoring and measurement program for resources such as water, electricity, LPG and other fuel consumptions
27. The college may take initiative for community plantation program by involving students to reduce the carbon emissions.

Chapter 5

Exit Meeting

The exit meeting was conducted by the lead auditor Dr. C.M. Joy and was the mechanism to feedback broad, preliminary findings to management and staff before the audit team completing the audited report. The exit meeting was held in the college on 2nd April, 2016. Clarification on certain information gathered was sought by the audit team from the management and staff of the college.

Draft Audit Report

The information gathered by the audit team was consolidated and written up as a draft audit report. This draft report was then circulated to the audit team and those directly concerned with the audit. The purpose is to check the report for accuracy. First and second draft audit reports were discussed with Principal, IQAC Coordinator and staff concerned with the green auditing. The corrected report was finalized in the exit meeting.

Final Audit Report

The final audit report is the corrected final document which contains the findings and recommendations of the audit. This was submitted on 22nd April, 2016 to the Principal of the college.

Follow up and Action Plans

Green audits form a part of an on-going process. Innovative green initiatives have to be designed and implemented every year to make the college environmentally sustainable.

Next Audit

In order to promote continuous improvement it is recommended to conduct the next green auditing during the year 2019.

Acknowledgements:-

CMJ Eco Associates are thankful to the Management and the Principal of the MES Asmabi College, P. Vemballur for entrusting processes of Green auditing with us. We thank all the participants of the auditing team especially students, faculty and non-teaching staff who took pain along with us to gather data through survey. We also thank the office staff who helped us during the document verification.