

GREEN AUDIT - 2021-22



MES COLLEGE MARAMPALLY

Aluva, Ernakulam

Kerala

EXECUTED BY



ATHUL ENERGY CONSULTANTS PVT LTD

4th FLOOR, CAPITAL LEGEND BUILDING,

KORAPPATH LANE, ROUND NORTH, THRISSUR, KERALA-680020

Ph: +91 735611199/0-6 Web: www.athulenergy.com E-Mail: info@athulenergy.com

March 2022

TABLE OF CONTENTS

PREFACE	4
ACKNOWLEDGEMENTS	5
EXECUTIVE SUMMARY	6
BASIC DETAILS	7
INTRODUCTION	8
GREEN AUDIT	9
CAMPUS ENVIRONMENT	10
SUSTAINABLE CONSTRUCTION OF BUILDINGS	11
1. VENTILATION AND CARBON DIOXIDE LEVELS	12
2. AESTHETICS	15
3. HERBAL GARDEN	15
4. VEETABLE GARDEN	16
5. FOREST COVERAGE AROUND MES MARAMPALLY CAMPUS	17
6. OXYGEN PARK AND NATURE THEATRE	18
7. SUGGESTIONS	21
WATER RESOURCES AND CONSERVATION	22
1. WATER CONSUMPTION	23
2. GROUND WATER RECHARGING	25
CONCLUSION	28
ANNEXURE-1	29

LIST OF TABLES

TABLE 1: BASIC DATA SHEET	7
TABLE 2: BUILT UP AREA	12
TABLE 3: CARBON DIOXIDE LEVELS	13
TABLE 4: MAJOR WATER USAGE	23
TABLE 5: WATER TAPS	24

LIST OF FIGURES

FIGURE 1: CAMPUS BUILDINGS (FRONT AND BACK SIDE OF MAIN BLOCK)	10
FIGURE 2: SUSTAINABLE BUILDINGS WITH TREE COVER.	11
FIGURE 3: OPEN SPACE AND INDOOR PLANTS	13
FIGURE 4: INDOOR GARDEN	14
FIGURE 5: AESTHETICS IN CLASS ROOM AND BUILDING.	15
FIGURE 6 GREEN COVERGAE OF COLLEGE	17
FIGURE 7: OXYGEN PARK AND PARLOUR	18
FIGURE 8: NATURE AUDITORIUM	19
FIGURE 9: GREEN ZONE	20
FIGURE 10 SILENT ZONE	20
FIGURE 11: DRINKING WATER DIAGRAM	22
FIGURE 12: WATER DIAGRAM	22
FIGURE 13: HOSTEL WATER DIAGRAM	23
FIGURE 14: QUARRY POND	26

PREFACE

Every institution should be imparting knowledge about the campus environment and its surroundings through activities that follows the principles of sustainability. Hence an evaluation is needed to understand where it stands in the path to be an environment friendly, talent nurturing educational institution. This Green Audit was done with the aim to assess and rate the sustainable nature of the campus. The college vision is “to enlighten and empower women in rural and suburban society and enable them to act as agents of social transformation and acquire knowledge of self and surroundings and to make the world a better place”. And in the **social goals**, it is written as “**to make the students aware of the pressing global issues and the moral responsibility to handover to the coming generation an eco-friendly life style and an earth free from pollution, filth, bigotry and corruption**”. It was observed by us from the students’ participation during the green audit.

This report is compiled by the Certified GIIIHA rated Professional along with the project engineers who are experienced in the field of energy, environment and management. The student volunteers made a mammoth contribution with data collection and preparing an initial skeleton for the report.

ACKNOWLEDGEMENTS

We express our sincere gratitude to the **MES College Marampally Aluva, Ernakulam**, for giving us an opportunity to carry out the project of Green Audit. We are extremely thankful to all the staffs for their support to carry out the studies and for input data, and measurements related to the project of Green audit.

- | | |
|---------------------------|---------------------------------------|
| 1. Adv. A A Abul Hassan | Chairman, College Managing Committee |
| 2. Jb. M A Mohammed | Secretary, College Correspondent |
| 3. Jb. T M Zakeer Hussain | Treasurer, College Managing Committee |
| 4. Dr. Ajims P Mohammed | Principal |
| 5. Dr. Jasmine PM. | Vice Principal & IQAC Co-ordinator |
| 6. Shri Abdul Jabbar CI | Junior Superintendent |

Also congratulating our Green audit team members for successfully completing the assignment in time and making their best efforts to add value.

GREEN AUDIT TEAM

1. Mr. Ashok K M P

Registered Energy Manager of Bureau of Energy Efficiency (BEE – Govt. of India)
Certified GHRIHA rated Professional, Energy Manager No – EA 25612,

2. Mr. Harikrishnan K,

Project Engineer



Yours faithfully

Managing Director
Athul Energy Consultants Pvt Ltd



EXECUTIVE SUMMARY

- The entire campus having area of 25 acre and the MES College and greenery is covered the buildings.
- MES Marampally adopted a sustainable building construction in its buildings. This will gave minimum environment impact to the nature.
- Building have maximum ventilation and natural light in all areas. This drastically reduces the usage of ceiling fans and tube lights in the class rooms/ labs.
- Herbal garden is created and maintained well.
- Having an oxygen park and natural theatre to reduce the academic stress
- Well maintained indoor garden in the college and aesthetically designed entrance by vertical garden.
- Water requirement for the MES Marampally is met by Bore well, Quarry pond, Well and supply and tanker supply. Bore well is mainly used for hostels and other areas.
- There are 2 quarry ponds maintaining well in the college as for rain water collection and reuse of collected water to the college.
- Lot of student initiates are in college through Nature club, various seminars, workshops are conducted by NSS & nature club of College

Suggestions for Improvement

- Install water meter in main supply and provide sub metering in other usage areas.
- Rain water harvesting (RWH) to be installed for collecting and use of rain water from buildings for catering water requirements toilets, wash basins in main buildings and hostels during rainy days.
- Construction percolation pits and contour trenches around campus after conducting detailed study on geographical topology of areas.

BASIC DETAILS

The general details of the MES Marampally college is given below in table based on the data availed from the college.

TABLE 1: BASIC DATA SHEET

SL. NO	PARTICULARS	DETAILS
1	Name & Address of college	MES College Marampally, Aluva, Ernakulam Kerala 683107
2	Contact person	Dr. Raphika PM Assistant Professor & Programme officer of EECC Department of Electronics, MES College Marampally.
3	Location: Latitude & Longitude	10.1066° N, 76.4115° E
4	No. of Teaching staff	146
6	No. of Non-Teaching staff	60
7	No of students	2685
8	Building area	18885m ²
9	Land area	25 acres
10	Number of UG programs	17nos
11	Number of PG programs	09 nos
12	Number of departments	19nos
13	Hostel mates	150 nos
14	Average annual working days	263 days, (139 for odd and 124 for even semester)
15	DG Set	50 kVA (2 each)
16	Transformer	200 kVA (1 No)

INTRODUCTION

M.E.S College -Marampally, situated in the KSRTC Route of Alva-Perumbavoor route, is the dream child of the MES Group of institutions in the field of Higher education. MES Group foreseen that this college requirement would cater to the educational needs of the suburban villages, in and around Aluva and Perumbavoor. M.E.S. College Marampally is a Government Aided college affiliated to Mahatma Gandhi University, Kottayam, established in the year 1995. The College has reaccredited by NAAC with A+ Grade (CGPA, 3.38) which is the first ever highest grade in the State as per the revised process of accreditation.

The Principal, the teaching staff, and the non-teaching staff work together as a well-knit team. The dedication, competence, and diligence of the staff have raised the reputation of the college within a short span of time. The college encourages many co-curricular activities, thus playing a major role in molding the personality and empowering the young ladies to rise to the challenges in their daily life. The main thrust is to make them respond creatively and positively to the various needs of the society and the community they live in. Thus, the NSS, NCC, Career Guidance, AIDS Awareness Cell, Reader's Club and Nature Club function effectively. Apart from these, various Enrichment Programs are being planned and conducted for the holistic development of the students.

The Campus, spread out in a hilly stretch surrounded by lush greenery, is a sure sight of delight for a lover of nature. The College is also in close vicinity to the river Periyar and very near to the city of Kochi and the International Airport, the satellite view of the college is shown in the following Figure 1. The academic building of the college is marked with the college name. The college ground is located west of this building. There is a plantation of banana plants south of the college ground. The College hostel building is located south of this plantation. Other main buildings are located south of the academic building.

The College offers Nineteen UG Programmes such as Computer Applications (BCA), B.Sc. Electronics, Business Administration (BBA), B.Com. (Model II), B.Com. (Taxation), B.Sc. Biotechnology, B.Sc. Microbiology, B.Sc. Physics (Model II) B.Sc. Mathematics (Model II), B.A. English, (Three Main) B.A. Arabic (Model II), B.Sc. Psychology, B. Voc. Logistics Management, B. Voc. Animation & Graphic Design, B. Voc. Software Development & System Administration, B. Voc. Fashion Designing & Management. Voc. Industrial Instrumentation & Automation, B.Voc Tourism Administration & Hospitality, B.Voc Advanced Course in Multisport & Fitness training and Ten Post Graduate programmes viz. M.Sc. Biotechnology, M.Sc. Electronics, M.Com. M.Sc. Microbiology, M.Sc. Biochemistry, M.A. English Language and literature, M.Sc. Computer Science, MHRM and M.Sc. Physics, MSc in Chemistry (Aided)



GREEN AUDIT

The whole world is on the road to a sustainable development, and the environment conservation is the top priority among the list as every human activity has its effect on their surroundings, which is the environment. Hence be it a house, a commercial building, an industrial building, or any other construction will disturb the balance of the environment. Engineers are increasingly expected to play leadership roles when it comes to sustainable development, working to solve global challenges such as the depletion of resources, pollution, ecosystem damage, and the effects of rapid population growth. It is very important to do a detailed study about the effects on the environment. This is conducted under the name of *Green Audit*, which can be defined as *the official examination of the effects a company or other organization has on the environment, especially the damage that it causes*. The objectives of the green audit can be listed as follows:

- Including participants from every section of the organization in the auditing process.
- Understanding the environment by drawing a simple sketch of the total area.
- Identifying the activities in the premises and listing them.
- Calculating the resource consumption like the land and water.
- Assessing the waste management and disposal.
- Study the energy usage pattern.
- Identify the good practices.
- Suggest the viable solutions to improve the sustainable nature of the organization.
- Compile the report with the above-mentioned details.
- Conduct a walkthrough audit to check the suggestions implemented by the institution and suggest for further improvements
- Verify all the points with actual measurements is it is meeting the performance and gave suggestions for improvement

Demands for energy, drinking water, cleaner air, safe waste disposal and transportation issues are increasing day by day. This needs new infrastructure development for protecting the environment. Engineers have a critical role to play for this sustainable development. In this audit we aim to identify the areas of positive development done by the college and to point out the suggestions for improvement s.

CAMPUS ENVIRONMENT

The environment in and around the college campus plays an important part in maintaining a healthy atmosphere in nurturing talents. Trees are the major source of the oxygen we breathe, and receiver of the carbon dioxide we exhale. The sustainability of an ecosystem depends on the number of plants and trees in and around the surroundings. The campus building is located in a center of lush greenery with ample free space. The main building and other buildings have ample ventilation.

Ultimately the campus is maintaining natural equilibrium with trees, birds and water bodies along with human interactions.



Figure 1: Campus Buildings (Front and back side of main block)

Scientific studies are proved that the nature can able to cure any diseases and this will reduce the stress among students during theirs studies and also increase the compassion among them and to nature. Ultimately the campus is maintaining natural equilibrium trees, birds and water bodies with human beings. Gardens and landscape are an aesthetic delight and it promotes attentiveness of students. Persons exposed to plants have higher level of positive feelings (pleasant, calm) as opposed to negative feelings (anger, fear).

The construction of all buildings of MES Marampally have ample ventilation and air flow and keeping a silent atmosphere to the students. The air flow from lush green atmosphere and indoor garden in the buildings create a distress atmosphere in the college and maintaining the harmony with nature.

SUSTAINABLE CONSTRUCTION OF BUILDINGS

Energy consuming devices installed to achieve the comfort levels for the occupants of the building gives rise to heat generation which adversely affects the environment within the building and in the surrounding. Buildings are thus the major pollutants that affect the urban air quality and contribute to climate change. Buildings are the major consumers of energy during their construction, operation and maintenance.

MES Marampally has developed an ecological design in their buildings and adopted minimum negative impact on ecosystem. Their approach to the constructional activities consciously is to conserve energy and ecology and avoid the adverse effects of ecological damage.

MES Marampally management constructed the building to optimum utilisation of land and classrooms and with abundant light and natural ventilation. Maximum day light ingress and natural ventilation increases the indoor air quality and avoid the sick building syndrome. The whole facility and buildings are designed to maximum and optimum utilisation of land is done.



FIGURE 2: SUSTAINABLE BUILDINGS WITH TREE COVER.

There are major buildings in the campus. The purpose and the built-up area of the buildings are given below. All these buildings are placed in a lush green of trees and also constructed as of without affecting the ecological system. The master plan of MES Marampally has been drawn to ensure and sustain harmonious blend of human and environmental well-being. Accordingly, spaces for academic, administrative and recreational areas are delineated in harmony with the topography to ensure an eco-friendly campus.

TABLE 2: BUILT UP AREA

	Particulars	Purpose	Built up Area in M2
1	Main block	Adm. office, Class rooms, Dept. rooms	7195
2	EK Abdul Khader Block	Class rooms, dept. rooms	2836
3	Language block	Class rooms, Dpt. Rooms, lab	988
4	New Block	Class rooms	4242
5	Toilet Block	Toilet	220
6	Staff Vehicle parking	Toilet	252
7	Health club	Health club	514
8	Generator room	Generator room	38
9	Motor shed	Motor shed	5
10	Auditorium	Auditorium	1419
11	Cafeteria	Cafeteria	91
12	Bus drivers rest room	Drivers rooms	13
13	Common amenity centre	Amenity centre	459
14	Canteen	Canteen	195
15	Mosque	Mosque	431
16	Ladies Hostel		2400

1. VENTILATION AND CARBON DIOXIDE LEVELS

Ventilation moves outdoor air into a building or a room, and distributes the air within the building or room. The general purpose of ventilation in buildings is to provide healthy air for breathing by both diluting the pollutants originating in the building and removing the pollutants from it. The nursing college is designed to provide maximum natural ventilation with abundant flow of light into class rooms. Due to this natural ventilation in lush green campus reducing the sick building syndrome and stress generated from the study by abundant supply of fresh air.

Air quality is a major area of concern inside a building. The percentage share of oxygen and carbon dioxide should be such that the occupants are able to perform their tasks without any discomfort. This is generally done through a provision of fresh air duct for the air conditioning systems or by providing windows. Numerous factors need to be considered for the design and fabrication of the fresh air supply system like the number of occupants, weather pattern and air quality of the location, and so on. For the human comfort, production of carbon-dioxide (CO₂) within a building space is the

prime area of consideration. This is associated with respiration which produces CO₂. As a result, the carbon-dioxide levels will increase if ventilations are not provided.

As per various standards (like the ASHRAE Standard 62.1-2016), indoor CO₂ concentrations up to 1200 ppm is considered acceptable. For a typical outdoor condition, this value may change from 300 to 500 ppm.

The measurements were recorded along different locations inside the campus and the peak values are given in the following sections. The key concentration was on the study of carbon dioxide levels.

TABLE 3: CARBON DIOXIDE LEVELS

Sl. No.	AREA	Measured CO ₂	Standard CO ₂ level (Range)	Remarks
1	Administration Block inside	600	300-500	Good
2	Dept. Bio Science	425	300-500	Good
3	BSc Bio technology	600	300-500	Good
4	BCA Lab	650	300-500	Good
5	Dept. of Electronics	340	300-500	Good
6	Auditorium	390	300-500	Good
7	Library	350	300-500	Good
8	Hostel	390	300-500	Good
9	Canteen	550	300-500	Good
10	Physics lab	450	300-500	Good
13	Dept. of Chemistry	460	300-500	Good
14	Class room Arabic	480	300-500	Good



FIGURE 3: OPEN SPACE AND INDOOR PLANTS

ACOUSTICS IN BUILDINGS

Building acoustics is the science of controlling noise in buildings. This includes the minimisation of noise transmission from one space to another and the control of the characteristics of sound within spaces themselves. It is very hard for students to learn in noisy class rooms. Building Acoustics are an important consideration in the design, operation and construction of most building and it has significant impact on health, wellbeing, communication, productivity and learning capabilities. The building acoustics influenced by many factors such as geometry and volume of buildings, reflection and absorption of surface of materials used for buildings, air born noise etc. While designing class rooms the building should have low reverberation time and thus it will not produce echo or noise for sound. Indoor plants and open spaces inside the buildings increases the absorption of sound and it will not return as echo. The leaves of plants absorb the sound waves and kept the building as less noisy

Acoustics and indoor plants are playing vital role while designing buildings for office and educational institutions. In addition to aesthetics the indoor plants provide the calmness and stress-free atmosphere to the students. The comfort level is increased by proper ventilation, oxygen level, less noise and soothing atmosphere.

All the buildings including administration office, hostels and classrooms a, workshops are away from road and it is surrounded by lush green trees. The noise to the buildings by the transportation, other noises from other buildings are also heavily reduced and it is not affected to the inhabitants.

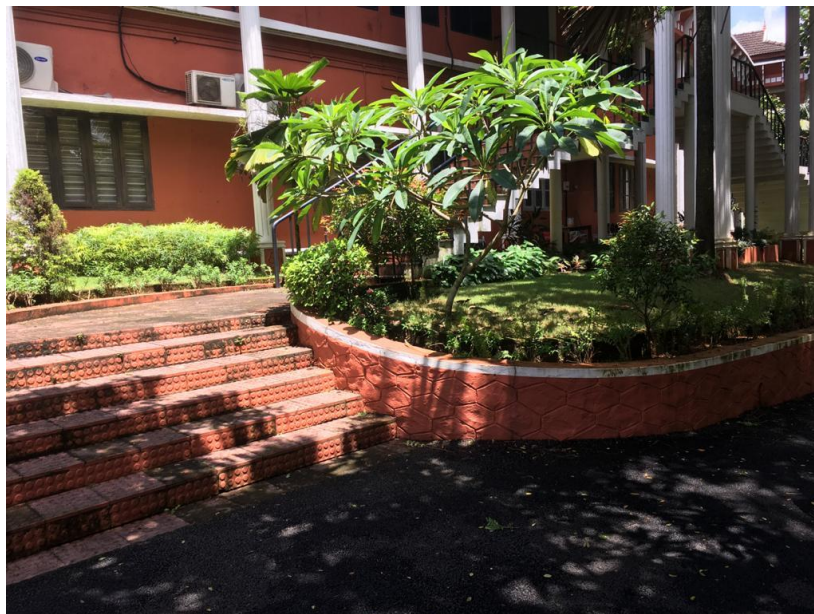


FIGURE 4: INDOOR GARDEN



2. AESTHETICS

Aesthetic quality is an aspect of all activity, perception, and intelligent thought, aesthetic education helps students discover new ways of looking at, listening to, moving in and speaking of their everyday experiences. Aesthetic have important role to develop a student and it improves the interpersonal relationship and gave it broad outlook. MES Marampally College designed in an aesthetic way and the paintings depicted in the B.Voc class rooms displaying the approach of college management about aesthetics.



FIGURE 5: AESTHETICS IN CLASS ROOM AND BUILDING.

3. HERBAL GARDEN

The literal meaning of Ayurveda is “science of life,” because ancient Indian system of health care focused on views of man and his illness. It has been pointed out that the positive health means metabolically well-balanced human beings. Ayurveda is also called the “science of longevity” because it offers a complete system to live a long healthy life. It is an interactive system that is user-friendly and educational. It teaches the patient to become responsible and self-empowered. It is a system for empowerment, a system of freedom, and long life. A significant part of knowledge and tradition is currently being eroded due to modernization, acculturation and availability of alternatives. Therefore, it is urgent to inculcate young minds to realize the fascinating knowledge and tradition associated with these resources and help them understand the immense potentials the Kerala medicinal plants possess for the future.

The “Promoting Herbal Gardens in Schools and colleges” has been a fun-filled learning activity for the students where they got the opportunity to learn about the medicinal plants by actually planting the medicinal herbs and watching them grow in their gardens, and by exploring information about them from various sources.



The task of making the garden itself has been enriching in terms of making students realize the importance of teamwork such as detailed planning, and allocation of tasks within a team. For the teachers, herbal garden project has been useful in terms of ease with which they could integrate the concept with other subject matter activities, such as writing essays, poems and stories, making posters, drawing and painting, making herbariums, and even preparing food recipe using some of the culinary herb's students have planted in their gardens. Kerala Government is also making lot of initiatives to developing and inculcating the herbal gardens in schools and colleges.

There is lot of trees in the MES Marampally having medicinal properties in the college which is protected by the college NSS club and the management. By preserving and nurturing the nature beauty of college, the management sends the message to society as its commitment to the environment. The students also get a practical experience in their academic life for the adaptation of green engineering in their future carrier life.

4. VEETABLE GARDEN

It is a garden that exists to grow vegetables and other plants useful for human consumption. Gardening can provide students with hands-on learning opportunities while increasing environmental awareness and vital experience in problem-solving. The school gardens are changing the eating habits of the students

Gardens are a wonderful way to use the college campus as a classroom, reconnect students with the natural world and the true source of their food, and teach them valuable gardening and agriculture concepts and skills that integrate with several subjects, such as math, science, art, health and physical education, and social studies, as well as several educational goals, including personal and social responsibility. They gain self-confidence and a sense of "capableness" along with new skills and knowledge in food growing — soon-to-be-vital for the 21st century students become more fit and healthy as they spend more time active in the outdoors and start choosing healthy foods over junk food.

In MES Marampally lots of vegetables are cultivated seasonally like Cabbage, Cauliflower, Brinjal, Ladies Finger, Turmeric, Ginger, Green Chilly, Birds eye Chilly (Kanthari Mulaku), Tapiaco, Plantain, banana, Pappaya, Curry leaves, etc.



5. FOREST COVERAGE AROUND MES MARAMPALLY CAMPUS

MES Marampally is surrounded by lush green forest. The total area of 25 acres of land is covered with trees and it is well protected by management. Educational institutions serve as important incubators for developing a 'green' sense among students and teachers and create a new generation of professionals to drive the future change. Green sense is the sensitivity towards environment that is addressed in our decisions, practices and general lifestyle. In MES Marampally teaching sustainability and environment not in books but it is demonstrated in the campus. Due to green coverage the campus is cool and do not required fan for ventilation.



Figure 6 GREEN COVERGAE OF COLLEGE

Such a place can have following benefits to the ecosystem.

1. **Maintain the equilibrium of air and food:** Humans and animals need food and oxygen and excrete carbon dioxide and water. The plants, algae, etc, in the forest use carbon dioxide and water and release or produce oxygen and food.
2. **Filter and store water, and drastically reduce storm-water runoff:** Forests filter and regulate the flow of water. The litter over the forest floor acts as a sponge which filters, stores and gradually releases the water to natural channels and ground water.
3. **Conserve valuable topsoil and reduce soil erosion:** A forest is like a protective green cloth over Mother Earth's fragile body.



4. **Conserve biodiversity and balance ecology:** In a natural environment, the populations of species are balanced to an optimum minimum level
5. **Reduce pollution:** Plants can remove and/or Phyto remediate pollutants and contaminants from soil and water.
6. **Arrest or reverse global warming:** Global warming can cause extinction of species, tropical cyclones, extreme weather, tsunamis, abrupt climatic change, sea level rise, increased human stress resulting in violence, etc. These are just a few of its catastrophic effects. Plants can lock CO₂ in their bodies to save our planet and the life on it.
7. **Acoustics of the college will gave comfort zone for academic purpose. :** Green coverage around the building reduces the sound by absorption by leaves thus the echo and reverberation of sound will come down.

6. OXYGEN PARK AND NATURE THEATRE

Green space in the college where you can go for morning and evening walks, as well as for picnics. Oxygen Park is a location where we can rest and release all our stress by nature. In this aesthetic location with ample ventilation take us into heaven in the earth. his park is anything but regular with its many sections for picnic lovers, children, fitness enthusiasts, and just about anyone who wants to spend some quiet time amidst nature. Fitness enthusiasts, get here for some fresh air and undisturbed yoga sessions. Undisturbed nature along with water bodies enhances your creativity due to comfort feeling to mind along with abundant supply of oxygen.



FIGURE 7: OXYGEN PARK AND PARLOUR



NATURE THEATRE (OPEN STAGE)

Open stage behind the main building can accommodate more than 4000 persons. The stage is located in the back side of main building. The basketball court In front of the nature theater uplift the beauty of the location. Nature playing a vital role in this stage because it will create only sound not echo or noise during the show. Due to the leaves of the plants will absorb all the echo reverberated from the buildings.



FIGURE 8: NATURE AUDITORIUM

KUTTIVANAM / GREEN ZONE

This Relaxation Area is designed to help students improve their emotional, mental and physical health. Spending time in green spaces with friends has indeed great psychological and physical impacts on the psyche of the students. This untouched forest cover one of the major oxygen supplier to the nature.



FIGURE 9: GREEN ZONE

SILENT ZONE

Now a day's silent zones are getting important in academic institutions. The noise pollution leads to stress and other medical and neurotic problems to children's and also creativity and absorption capacity of knowledge is also going down. For reduction of academic stress level there is apace for complete relaxation which gives the importance of silence zone. MES Marampally College have aerated certain silent zones in the college itself. Mosque in the college is gives its spiritual acme to the students and also total silence is also keep there. Natural silence zones are also crated in the college campus where there is no sound other than natures sound.



Figure 10 SILENT ZONE



7. SUGGESTIONS

- ❖ Mark the trees around the campus, Display boards such as Oxygen Park, Nature open stage herbal garden, vegetable garden, etc has to provide.
- ❖ Documentation to be done as list of trees, carbon sequestration by measuring its diameter, height, botanical name, medicinal importance etc. This list has to be updated in every 6 months.
- ❖ Boundary to be made for zodiac star garden and marking to be done in the trees as its star, local name of tree, botanical name.
- ❖ Vegetable garden can be created open space in front of lady's hostel and behind of open theatre
- ❖ New Miyawaki forest can be created as a specimen for the students and the public. This will increase the attitude among others for creating a forest cover in a limited space. .

WATER RESOURCES AND CONSERVATION

MES Marampally uses water mainly for latrines and drinking purpose in all buildings, cooking in hostels and main canteen and for gardening. There are mainly three sources of water supply to the college.

I. Bore wells

The bore wells in and around the campus counts to 03 nos, situated in the ladies’ hostel and compound area which supplies water to the overhead or underground tanks and redistributed to various buildings.

II. Quarry

The water that stored in the three quarries in which two are using for latrines in various buildings and gardening the college campus.

III. Water tanker

Water supply from water tankers are used in case of extreme summer and in extreme emergency cases. It mainly supplied to canteen, ladies’ hostels and for campus toilets. Provisions are made in ladies’ hostels and other areas for this purpose.

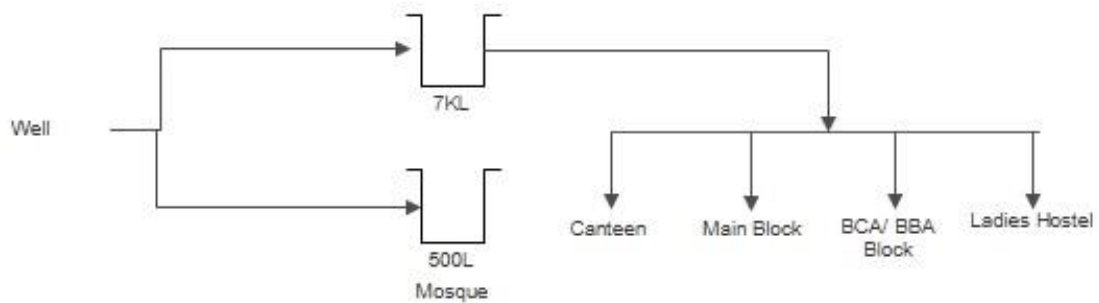


Figure 11: Drinking Water diagram

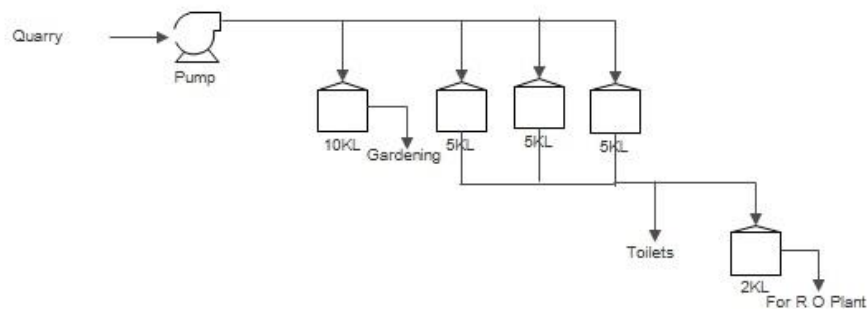


Figure 12: Water diagram

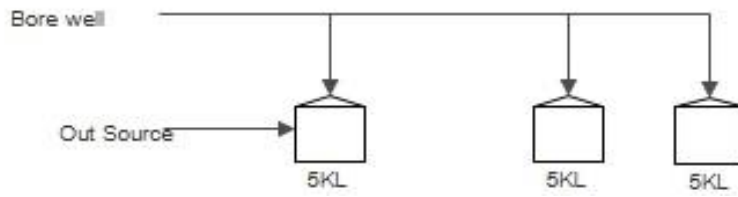


Figure 13: Hostel water diagram

1. WATER CONSUMPTION

The labs have the highest tap points whereas the toilet accounts for the major consumption. The water outlet points in the college campus and hostel are listed in the following table.

TABLE 4: MAJOR WATER USAGE

Location	Daily Consumption(M3)	Average working Days	Total Consumption(M3)
College Tank -1	0.8	200	160
College Tank -2	0.7	200	140
Main block	120	200	24000
Hostel	25	250	6250
Gardening	100	250	25000

Area of Usage in college

TABLE 5: WATER TAPS

Location	No: of water taps
Washing area	10
Press type	06
Toilets	35
Flush	32
Comfort room	10
Hostel	39
Canteen	8
College compound and garden	10
Lab	67
Total	217

Inference

- i. The average approximate water consumption in the MES Marampally is 1500 kilo litres/month.
- ii. The majority of the consumption is for lavatories and gardening purpose.
- iii. Actual consumption couldn't monitor due to the non-availability of water meters in the campus.

Suggestion

- i. Install water meter separately at the pipelines that supplies water to each location
- ii. Record this measurement once in a week so that the college can understand the usage pattern vs the functioning of the building and can initiate the reduction in consumption, such as, automatic urinal flusher using sensors and automatic water taps using motion sensors in toilets of main buildings and other higher consumption areas.
- iii. Drip irrigation can be used for watering the garden plants.

2. GROUND WATER RECHARGING

Depletion of vegetation cover, pollution of water, from different sources, soil erosion and recession of water table are impacting nature and environment. The nature has been generous in bestowing this region in the form of rain fall but with the absence of scientific management it is becomes waste. But proper collection, routing recharging and recycling of this water will increase the vegetation and increase ground water table level.

Rainwater harvesting (RWH) is a technique of collection and storage of rainwater into natural reservoirs or tanks, or the infiltration of surface water into subsurface aquifers (before it is lost as surface runoff). There are different methods for artificial rain water harvesting. Ground water recharging by different means and collection of rain water for direct use by installation of rain water collection tank. Ground water recharging methods are decided by detailed study of rain fall, geological and hydrogeological mapping of the area etc. Another method of rainwater harvesting is rooftop harvesting. With rooftop harvesting consists of installation of pipes, filtration unit, by pass valve, tanks pumps etc.

Rainwater harvesting for ground water recharge.

Advantages

- Conservation of water for future use
- Biological purity of water is good
- It is environment friendly, controls soil erosion and flood and provides sufficient soil moisture even during summer months
- It provides a natural distribution system between recharge and discharge points
- Quality improvement by infiltration through the permeable media
- Water stored underground is relatively immune to natural and man-made catastrophes

MES Marampally done lot of initiatives for collecting rain water by routing it into old quarry ponds in 3 locations. All this water is percolating to the ground. Contours are developed in many areas to recharge the ground water Well are provided as 3 areas for collecting water which they are recycled back to use.

Collection of water in natural pond

Infiltration ponds (also called infiltration basins or percolation ponds) are large open water ponds that are either excavated or in an area of land surrounded by a bank, and normally will not exceed 15,000 m³. They store rainwater but with the main aim of infiltrating the water to aquifers where it can be extracted using boreholes, hand-dug wells, or nearby springs. They are constructed in areas where the base of the pond is permeable and where the aquifer to be recharged is at or near the surface.

Facilitate recharge into surrounding ground which in turn improves soil moisture, improves agricultural productivity and mitigates against drought

- Can assist recharge of shallow wells, boreholes and springs
- Can reduce salinity in groundwater



FIGURE 14: QUARRY POND

SUGGESTIONS FOR WATER CONSERVATION AND GROUND WATER RECHARGING.

- The use of biomass in the form coconut shells can be used to cover the foot of the trees which can behave as recharging soak pits.
- Construction of percolation pits (Mazha kuzhi) around the campus area for collecting the rainwater flush through ground surface. This will reduce the velocity of flow of water, soil erosion, maintain the surface moisture level for longer time after rainy season etc which will help to maintain the green forest coverage for longer time and useful for ground water recharging.
- Suggested to conduct a detailed study on geological and hydrogeological mapping of the area to find out proper sizing of percolation pits, contour trenches, deep well recharging, collection of water passing through road, gutter etc

CONCLUSION

Green Audit is the most efficient & ecological way to solve such an environmental problem. Green Audit is one kind of professional care which is the responsibility of everyone who are the part of economic, financial, social, environmental factor. 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.

The auditors observed during the campus visit and after the conversation with the staff and students of MES Marampally that they have taken continuous and considerable effort in several years for nurturing and maintaining the green coverage over the campus which is being well appreciated by us. There is still opportunity to attain the perfection some of the identified suggestions are listed in the executive summary.



ANNEXURE - 1

GRIHA CP CERTIFICATE



GREEN RATING FOR INTEGRATED HABITAT ASSESSMENT

GRIHA CERTIFIED PROFESSIONAL CERTIFICATE

This is to certify that

Ashok K M P

has qualified as a **GRIHA** Certified Professional For V. 2015

Date of issue: 19th June 2020

Note : This certification is valid only for GRIHA version 2015.

Chief Executive Officer
GRIHA Council