ENVIRONMENT AUDIT REPORT

2021-22

in compliance with the statutory requirements under
the NAAC accreditation procedures

AVVP Samiti's
Shri Annadaneshwar
Arts, Science and Commerce College.

Naregal, Dist:Gadag, Karnataka

Principal Lead Auditor:

Mallikarjun A Kambalyal. CEA, ISO 50001, 14001 Lead Auditor.

SUNBSHUBH TECHNOVATIONS PVT LTD.

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IMAGES AS CAPTURED ON SITE.

ABOUT SUNSHUBH TECHNOVATIONS PRIVATE LIMITED

Sunshubh Technovations Private Limited is registered in the year 2020 and has evolved from initial proprietary concern, Sunshubh Renewables & Research Centre. Sunshubh has been in operation since 2008. Sunshubh today is led by a team of well experienced Certified Energy Auditors and tech- savvy young engineers.

We believe in Identifying opportunities and executing solutions based on need with highest priority to Energy conservation over efficiency.

Since beginning, Sunshubh has been growing and today, we have wide range of clientele In the field of Industry : Tool room, Chemicals and refinery, Mining, Health, Hospitality, Food processing, Infrastructure and Educational institutions under NAAC compliance. Our approach has been very aggressive in equipping ourselves with the latest instruments.

After decade of professional experience, we restructured ourselves and thus the formation of a Private Limited company on 22nd July 2020.

Today we have with us the technical team comprising three Certified Energy Auditors, One Certified Energy Manager and support team of young and enthusiastic engineers to comply to the client requirements.

POLICY MATTERS

Learning from our training in Germany and their policies, SUNSHUBH does not supply any energy saving equipment's or systems. However, we do stand up to support and execute the measures to prove our findings right. This is mandatory to assure the client that we do not market any self-centred product or orient the Audit assignment to sell any third party product. Meaning to say **we stand neutral to all methodologies in the interest of adopting best technologies.**

We strongly believe in sharing our knowledge and training inhouse manpower for continual improvement in energy flow.

We have set a policy not to hire the instruments from third party but to procure every small or big ones to do justice to our clients.

CARBON FOOTPRINT - GREEN PLEDE (PROPOSED)

We the Principal, the staff and students, adopt responsible practices in our daily activities with due regard to the environment. We set and continually review objectives and targets for achieving our goal to protect our entire college premises in front, backyard and all other non-approachable areas of all primary and secondary pollutions.

We seek to compile with safety and environmental regulations to implement inhouse standards to improve our environmental performance. We commit ourselves to the safe operation of all our working habits, be it in classrooms, library, canteen, on road, off road, in-campus out-campus as well as at our place of stay.

We adhere to reduce environmental load by efficiently using resources, saving energy, reducing waste, encouraging material recycle, with special emphasize to minimising emissions of greenhouse gases, ozone depleting substance and particle matter.

We endure to minimise environmental loads and adopt environmentally friendly technologies when ordering and purchasing necessary products and resources.

We endure to attend educational programs and promulgate our close friends and colleagues to follow suite We endure to ensure that we recognize the essence of this Green policy by actively and aggressively conducting workshops and training to all in environmental concepts. We make wide ranging social contribution to close association with the students, teaching staff, administrative staff, housekeeping staff by disclosing environmental information and supporting environmental consumption.

-Sd-
Principal

(*Indicative templet for display at all prominent areas, waiting rooms, canteen, library, relaxing areas in the campus.*)

EXECUTIVE SUMMARY.

For details, please follow the discussions in the report.

Sl	Observations	Issues & Problems	Resulting losses	Remedial measures	Capital	Projected savings
1	Water manage-ment.	Flooding the lawns.	Excess water consumed.	Sprinkler.	@ Rs1000/- per unit.	Energy & Water savings
2	Organic waste manage-ment.	System needs to be brought into order.	Handling costs	Composting at point of source	Nil.	Third party handling costs
3	Clear windows	Distraction of attention	Failed objective.	Filming	Few thousands	Better academic results.
4	Rainwater Harveting Abuse and Use.	Water contamination	Loss of quality water source.	Proper filtration should be incorporated.	@ ₹8000/-	Third party supply.
4	Chemical waste disposal	Attracts pollution control boards authorities and capital costs	Loss of revenue	Good use practices.	Nil	Longer/extended life of Batteries
	LPG (Fuel) cylinders storage and manage-ment.	Fire hazards	Loss of life and loss of assets	Organised way of handling of explosives	Nil or minimum	Safety in place.

SI	Observations	Issues & Problems	Resulting losses	Remedial measures	Capital	Projected savings
5	HACCP practices.	Inconvenient and non-operation of assets and utilities provided.	Added manpower costs.	Provide Sanitary pad dispensers at easy & where required.	₹. 15000/- per unit.	Health safety compliance.
6	Utility Management.	Maintenance	Inefficient operation.	Periodical cleaning	NIL	Increased efficiency.
7	Food wastage and waste minimisation.	Random disposal	unaccountability	Segregate, weigh and deliver.	NIL	Minimised wastage.
8	Construction waste management.	Un accountability	Call for penalty or pollution	Land use change	Labelling & Transportation	Organised and compliance.
9	Asset management.	Unaccountability	Loss of records	Move the unused assets to proper store area.	NIL	Increased accountability.
10	Indoor Air Quality	Inhaling of polluted air	Human inefficiency	Fresh air filters	₹.10k-100k	Complains OSHO Safety standards
11	Fire Safety	No training, awareness and non-suitable place.	Loss of assets	Training and awareness	NIL/Minimum	Emer-gency prepared ness.

Objectives of auditors: Sunshubh Technovations (P) Ltd

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CRITERION VII – INSTITUTIONAL VALUES AND BEST PRACTICES FROM ENVIRONMENT AUDIT PERSPECTIVE.

Key Indicator - 7.1 Institutional Values and Social Responsibilities

Metric No.	Description	Compliance	Initiatives required
7.1.1 QIM	Measures initiated by the Institution for the promotion of gender equity during the last five years. Annual gender sensitization action plan Specific facilities provided for women in terms of: Safety and security - Energy	Partly Complied	1. Used sanitary pad are infectious. Proper disposal arrangement i.e. incinerator should be placed at appropriate place so that the user is comfortable. 2. Dispenser is required in all women rest rooms and waiting halls for ready to use. 3. The training for home and kitchen waste management may be initiated for the girls.

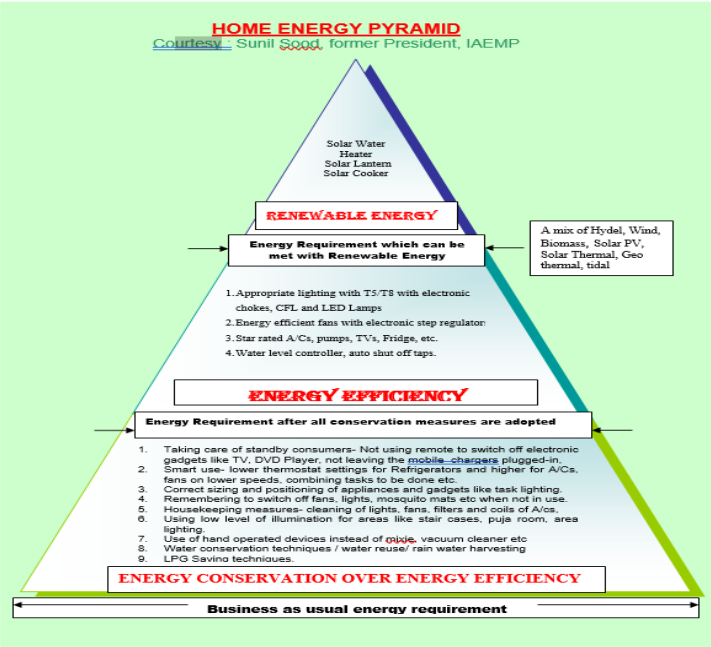

Figure 1 - Home energy pyramid

	Environmental Consciousness and Sustainability		Discuss how to use waste for indoor gardening.
7.1.2	The Institution has facilities for alternate sources of energy and energy conservation measures • Solar energy • Biogas plant • Wheeling to the Grid • Sensor-based energy conservation • Use of LED bulbs/ power efficient equipment	Complied through parent society.	Considering the cost of energy use, serious consideration may be taken up for, Solar Biogas plant in Hostel mess. If Biogas is installed the gas can be used to substitute LPG gas. Sensor based control is a must for energy use optimization. Complete the ongoing work at faster pace.
7.1.3 Q_lM	Describe the facilities in the Institution for the management of the following types of degradable and non-degradable waste (within 500 words) Solid waste management Liquid waste management Biomedical waste management E-waste management Waste recycling system Hazardous chemicals and radioactive waste management	Complied partially wrt minimizing	To place the waste collection bins. Since the institute has easy access to woven (eechal) buckets. These can be color painted with Green, Yellow and red and placed in corridors and within the campus for putting waste. The purchasing of these baskets/buckets help local tribes and enrich their economy as well.
7.1.4 Q_nM	Water conservation facilities available in the Institution:	Complied. Open ground	Initiate rainwater management system and exhibit water conservation methods.

	Rain water harvesting Borewell /Open well recharge Construction of tanks and bunds Waste water recycling Maintenance of water bodies and distribution system in the campus	percolation. Open well restoration Percolation pond near to open well	Placing soil moisture sensor devises can also help timely watering the plants.
7.1.5 Q_nM	Green campus initiatives include (4) 7.1.5.1. The institutional initiatives for greening the campus are as follows: Restricted entry of automobiles Use of Bicycles/ Battery powered vehicles Pedestrian Friendly pathways Ban on use of Plastic landscaping with trees and plants.	Partially complied.	Educate the youth in commuting by Bicycles. If travelling long distance, Electric vehicles should be promoted. The institute can also consider providing charging point for all electric vehicles. The benefits of commuting with Bicycle and EV cycle may be propagated.
7.1.6 QnM	Quality audits on environment and energy are regularly undertaken by the institution (5) 7.1.6.1. The institutional environment and energy initiatives are confirmed through the following 1.Green audit 2. Energy audit 3.Environment audit 4.Clean and green campus recognitions/awards	Complied.	The institute has undertaken to get itself audited. The benefits would be best exhibited by complying to the audit findings and getting the sane reviewed next year for further improvement. The benefits of such measures should also be discussed outside the campus and an awareness forum should be carried out in market areas.

	5. Beyond the campus environmental promotional activities		
7.1.7 Q_nM	The Institution has disabled-friendly, barrier free environment Built environment with ramps/lifts for easy access to classrooms. Disabled-friendly washrooms Signage including tactile path, lights, display boards and signposts Assistive technology and facilities for persons with disabilities (*Divyangjan*) accessible website, screen-reading software, mechanized equipment Provision for enquiry and information : Human assistance, reader, scribe, soft copies of reading material, screen reading	The initiatives have been considered.	Providing easy access to fresh rooms for the use of physically challenged demonstrates the concern for the environment and these initiatives go a long way in building better relation with the society and earn respect and recognition.
7.1.9 Q_lM	Sensitization of students and employees of the Institution to the constitutional obligations: values, rights, duties and responsibilities of citizens Describe the various activities in the Institution for inculcating values for being responsible citizens as reflected in the Constitution of India within 500 words.	Need to explore.	The sensitization of energy conservation and its impact on reduced carbon emission is important in the present situation. The impact of increased carbon emissions on disturbed rainfall, the drift in seasons, the rise in ambient temperature, the impact on cropping pattern resulting into disturbed food security should

			be a great lesson that can be carried to the society. . Every student to table their energy bills in the previous year. The savings in the forth coming year should be recorded and an energy ambassador award be shouldered on the top students. This activity brings in the sense of responsibility, accountability and importantly knowing their energy use and abuse.
7.1.10 Q_nM	The Institution has a prescribed code of conduct for students, teachers, administrators and other staff and conducts periodic programs in this regard.	Partially Complied.	A range of activities can be brought in just as discussed in 7.1.9 above. The Code of Conduct is displayed on the website . Annual awareness programs on being a responsible citizen, acting as ambassador to the environment pollution prevention and the Code of practices should be organized.
7.1.11 Q_lM	Institution celebrates / organizes national and international commemorative days, events and festivals Describe the efforts of the Institution in celebrating /organizing national and international commemorative days, events and festivals	Complied	In today's practices, the celebration has been formal. The actual celebration has to be yearlong. The theme for the year has to be laid and the activities should be conducted and on the day of celebration the selective activities be carried out. Please check the list of days to celebrate and mark on

	during the last five years within 500 words		National and International level. The list is tabled in the detailed discussions.
7.2.1 QIM	Describe two best practices successfully implemented by the Institution as per NAAC format provided in the Manual.	Complied.	When the listed activities from 7.1.1 to 7.1.11 are complied, the institute can have many creative best practices and the achievements can really bring in the name, fame and the recognition and appreciation not just on records but on monetary contributions as well.

The Bulletin on Energy Efficiency

August 2005 Vol 6 Issue 1

This publication is supported by

Indian Renewable Energy Development Agency
IREDA is a financial institution set up by MNES to provide concessional financial support to energy efficiency/ conservation and renewable energy sectors. For more information, see IREDA web site **www.iredaltd.com** or contact:

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FROM THE EDITOR-IN-CHIEF

The simple economics of water and energy security

It is estimated that the global annual use of commercial energy is about 400 Quads (quadrillion BTUs). The sun pours an additional 6 million Quads of radiant energy into the Earth's atmosphere each year. Thus in absolute terms, energy available is several orders of magnitude higher than demand. Yet, the world continues to struggle against an acute energy crisis. This leads one to believe that the problem is not merely of energy availability but rather a problem of affordability. Energy is a matter of pure economics, of demand and supply – at a cost.

A similar principle applies to water. Though roughly 80 percent of the Earth's surface is water, cheap potable and clean water is simply beyond the reach of millions across the world. Potable water sourcing, treatment, and distribution require considerable amounts of energy. Access to water is therefore closely linked to energy availability and affordability.

This close interdependence between energy and water needs to be clearly recognized and the nexus addressed suitably at the policy level. The first and foremost priority of any energy policy should be the wise, efficient use of whatever energy supplies are available. Similarly, priority should be given to the efficient use of whatever water supplies exist. Once the issue of efficient use has been tackled, focus can then be shifted on creating new energy and water supplies that meet sustainability and environmental requirements. And this may not be as difficult to achieve as it appears.

As in the case of energy use, the difficult part is reducing the quantum of water use while maintaining the level of benefits both for the customer and the utility. If this can be addressed, water utilities can save money as the reduced demand effectively creates more system capacity. With decreasing demand, the water utility effectively avoids additional investments in new facilities and equipment. Reduced volume of water flowing through the system has the attendant advantage of reduced frictional energy losses, thereby reducing the cost of pumping. This leads to a win-win situation for both the consumer and the utility, with the consumer benefiting through the reduced cost of delivery, diminished chances of water shortfalls, and the utility benefiting from decreased likelihood of major investment expenditures.

Needless to say that all this also saves energy. In rural areas, a large number of irrigation pump sets are either operated at highly subsidized electricity tariff from the power utilities or at no cost at all, encouraging the use of poorly designed inefficient pump sets which are over-rated and over-used. Replacing these pump sets with energy-efficient ones is one option, but who bears the cost? Another option is rainwater harvesting. For every one foot increase of the water table one achieves an approximate savings of 1 percent power.

Which means one gets more for the same energy use. That's simple economics.

Debashish Majumdar
Managing Director, IREDA

INSIGHT

Water–Energy: two faces of a coin

There is a direct relationship between water and power. A reduced water table is directly proportional to the square of the increased electrical power consumption, says the author

We all presume that if the dams and reservoirs are full then electrical power could be available in plenty. However, we tend to ignore that the demand for electrical power has been growing at a much faster rate than what we can produce and, hence, any amount of rain and or electrical power generated is insufficient to meet our demand. Most thermal power plants are running low owing to a short supply of coal. So where are we?

The recent changes in temperature and erratic rainfall has a direct relationship with urbanization. With increased urbanization and industrialization, we have only created a greater need for energy. This energy is sourced primarily from fossil fuels such as coal and nuclear power plants. In the absence of rains, the only means of generating electrical power is by burning fossil fuels. The burning releases emissions into the atmosphere, resulting in increased CO_2 concentration in the troposphere, and subsequently the greenhouse effect. The disturbed rainfall pattern is a result of this global warming.

The demand for power can be classified into four areas: agricultural need-based; industrial need-based; commercial need-based; and domestic need-based.

Today, a number of agencies such as the Bureau of Energy Efficiency (BEE), Petroleum Conservation Research Association (PCRA), the National Productivity Council (NPC) and a host of voluntary organizations, are working at ensuring energy efficiency in industries. But while the commercial and domestic need-based sectors have the potential, little is being done in this area. These sectors need a lot of education, motivation and awareness.

The agricultural industry needs the greatest attention, mainly in irrigation pump-sets (IPs). Most IPs are being operated free or on highly subsidized electricity supply. But eventually they consume a lot of power.

For instance, there are 16,000 irrigation pumps reportedly being operated under the HESCOM (Hubli Electric Supply Company), a division in North Karnataka. If, on an average each 5 HP pump consumes 3.73 kW of power per hour (there are actually a greater number of 10 HP pumps), the total consumption is as below:
For 10 hours per day = 37.30 kWh
For 200 days of watering = 7,460 kWh (7.46 MWh/pumpset)
For 16,000 sets, it is 119,360 MWh which means, 358,080 MWh of power generation at the power plant.

To reduce this consumption, should the IP users be asked to change over to energy-efficient sets? The question is:

- can the users afford the change?
- are they willing to accept the new brands of sets imposed on them?
- can the sale of inefficient IP sets be controlled?

Or should measures be adopted where the users may not use the IPs at all? Or can power consumption be reduced?

One good method is to reduce power consumed by IP sets by increasing the water table. If the water table can be increased by, say, 13 ft, then for the same 150 LPM delivery we will need a 4 HP (2.984 kW), and the savings for 16,000 IP sets would be 23,872 MWh, which is 20 percent – approximately 1.5 percent power saving for every feet of increase in the water table. This increase in water table can be achieved by adopting rainwater harvesting – through either bunds or by natural filtration tanks or by preventing pumping of water by making use of rainwater.

Now who meets the cost of these programs is one big question. Let us see how the electrical supply company benefits: If the organization spends around Rs 5,000 per IP set, we have Rs 800 crore as the capital investment on rainwater harvesting. For an annual savings of 23,872 MWh of electrical power, a savings of Rs 9.55 crore at the rate of Rs 4 per kWh for every feet increase in the water table.

It is always better not to use energy than try and save energy.

When a process industry utilizes water for its operations, then this water has to be demineralized or softened. To do this, it will need electrical power. Also due to dissolved solids and increased concentration, repeated breakdowns may happen, demanding periodic maintenance and scraping of industrial components, which means more energy consumption.

Now, greater the amount of rainwater harvested, lesser will be the dissolved solids, which means less breakdowns and increased fuel savings. Once the fuel consumption comes down, the release of CO_2 into the atmosphere is also reduced. Reduced CO_2 means lesser effect on global warming. This will then lead to stable weather conditions and predictable monsoons. Once the ecological cycle is renewed, achieving a balance between industrial, agricultural and environmental growth is easy.

Water is a renewable source of energy and must be conserved.

Courtesy: *Mallikarjun A. Kambalyal,*
President, Sunshubh Renewable Energy Foundation
E-mail: mallu_solar@yahoo.co.uk

PART 1 – GENERAL

OVERVIEW OF ENERGY AUDIT

The main objective of the energy audit of educational institutions is to set an informative work schedule. Although Electrical Energy is considered to be clean, it is not so, at the point of generation. The impact assessment of electrical power used out in day today activities are highlighted and Pros and Cons are discussed 'off the class room session'.

Self-contribution to the one's well-being is what is intended to be discussed. Judicious use of Electrical energy, reduces power demand and energy consumption. Optimising electrical use is key aspects of the Energy Audit.

On reducing the electrical energy, the power demand reduces. Reduced power demand enables reduced power generation at the point of generation which in India is mainly by Coal firing. This means lower fuel consumption which again leads to lower smoke i.e., CO2. If sourced from Solar, reduced power demand will call for reduced Solar power plant thus reducing CAPEX and smaller battery bank. At the end of it, both lead to lower emissions i.e., lower 'CARBON FOOTPRINT'.

The benefits would then be transacted into stabilised rainfall pattern.

CARBON FOOTPRINT AUDIT OBJECTIVES

Know Why? Where? What? When? How? about the Audit and its objectives.

Carbon Footprint Audit was initiated in the beginning of 1970's, with the motive of inspecting the work executed within an organization, whose exercises could cause risk to the health of inhabitants and the environment. It exposes the genuineness of the proclamation made by the organisation with the concern on health issues. As a consequence of their operations with respect to environmental pollution, it is the duty of the organisation to carry out the Carbon Footprint audit of the ongoing processes for various reasons, such as

- To make sure whether one is performing in accordance with the relevant rules and regulations,
- To improve the procedures and aptness of material in use,
- To analyse the potential duties and to determine a way which can lower the cost and to the revenue outflow.

Through Carbon Footprint Audit, one gets adoration as to how to improve the condition of the environment. There are various factors that were forced upon and determine the growth of/or conduct of Carbon Footprint audit. Incidents like, decades old Bhopal gas tragedy, that has left its residual effect which still haunts us; Our buildings catching fire due to various reasons; Industries blowing off taking valuable human lives etc.; People going sick, feeling tired, after long hours of operations in the organization; Increased demand of generators due to inconsistent power supply, which has resulted or lead into recent floods and droughts; are some of the situations to ponder about?

To address various issues in context with human health, ENVIRONMENT audit is assigned to "Criteria 7" of NAAC (National assessment and accreditation council) accreditation. NAAC is a self-governing organization in India that declares the institutions as Grade "A", Grade "A+", or Grade "A++"…, according to the scores assigned at the time of accreditation.

The other intention of organising Carbon Footprint audit is to update the environment conditions in and around the institutions i.e., within the compound and outside the compound. It is carried out with the aid of performing certain tasks like waste management, energy consumed, diesel burnt it performing the objective of the organization. Lastly to self-assess the net carbon footprint of the conduct of process in the organization.

The goals of Carbon Footprint audit

- The purpose of carrying out Carbon Footprint audit is securing the environment and cut down the threat posed to human health.
- To Make sure that rules and regulations are complied with.
- To avoid the environmental interruptions that are more difficult to handle and their corrections call for high cost.
- To suggest the best protocol for adding to sustainable development.
- To execute the process of the organisations utilising minimum natural resources and efficient use of those resources contributing to minimum waste generation.

How is the Carbon Footprint conducted from environment audit point?

- Pre-audit
- Planning
- selecting the team of auditors both internal and external
- schedule the audit facility
- acquire the background information
- visit areas under audit

On site conditions:

- Understand the scope of audit
- Analyse the strengths and weaknesses of the internal controls
- Conduct audit with end user comfort focused and making it easy to perform.
- Collect necessary evidence so that the stakeholders stand to understand how and where they are going wrong in the process of their conduct.
- Post audit draw the report based on the data collected.
- On confirmation of the preliminary report, draw a final report of the observations and inference with accuracy more near to implementable way.
- Discuss various remedial measures for alternatives if required.
- Prepare an action plan to overcome the shortcomings with continual observation on the action plan initiated.

STEPS UNDER CARBON FOOTPRINT AUDIT

Energy audit: It deals with use of energy in carrying out the task. In the Audit process conservation prevails over efficiency. Conservation awareness and implementation plays a significant role. Awareness in conservation brings in Efficiency by itself. Hence, energy audit will always consider not to use the energy if necessary. At best it can be used judiciously. The final objective is to assess the extent of impact on the environment either Direct or Indirect. One such key tool is CARBON FOOTPRINT.

Carbon Footprint also considers various other components as discussed below.

Water audit: Water is one of the cheapest commodities next to the Air we breathe. Although we Indians, use less water in comparison to western countries. However, the extent of pollutants that we leave behind has polluted all the resources including the deep well.

Rainwater harvesting is one of the best techniques that can be adopted by harvesting the rainwater and using it at the time of scarcity. the audit team to observe and investigate the relevant methods that can be adopted and implemented and draw the balance of use of water.

Waste management audit: The point of generation of waste, the type of waste generated, i.e., hazardous, recyclable and organically compostable wastes and segregating method at the point of generation for easy and best way to handle the same. Evaluating such methods to minimise the use of resources in the process of their management.

Environmental audit: It analyses how our activities and daily chores impact the air quality, noise level and the programs undertaken by the institution for plantation creating awareness of trees around us and how nature provides us with remedial measures within its framework.

Health audit: In the process of use of resources and conduct of the activities, they can develop impact on human health, that might be off minutely harmful, cause permanent disorder or may even cause death. Occupational health hazards are discussed in detail and the stakeholders are informed of the same and required necessary remedial measures indicated.

Renewable energy: To make in organisation net zero net zero carbon emission use of renewable resources including energy such as solar wind biogas geothermal energies are put into ooh utilisation.

Carbon handprint: The net impact All the above components of Carbon Footprint Audits are to make an organisation contribute zero emissions which are called bye

bhai use of water generation of waste use of energy e environmental damage health damage and finally to explore if the campus or direction can go in in contributing to third-party emissions minimising

Benefits of Carbon Footprint audit: To draw home the benefits, the system has been separated out into various audits as listed above. In doing so, and if audit findings are effectively implemented there are many advantages that can be practiced in the process

- Recognise the cost saving methods through waste minimising and managing technologies.
- Point out the prevailing and forth coming complications.
- Authenticate conformity with the legal requirements.
- Empower the organisation to frame a better environmental performance.
- Portray a good image of the institution which helps build better relationships with the group's organisations, stakeholders in and around its operations

Enhance the alertness for environmental guidelines duties and conduct of preparedness for any eventualities due to environmental disasters.

CARBON FOOTPRINT - GREEN PLEDGE 7.1.6

DAY's CARBON HANDPRINT PLEDGE (proposed)

(indicative templet for display at all prominent areas, classrooms, waiting rooms, canteen, library, relaxing areas in the campus.)

We, The Principal, staff and students, adopt responsible practices in our daily activities with due regard to the environment. We set and continually review objectives and targets for achieving our goal to protect our entire college premises from all pollutions primarily.

We seek to compile with safety and environmental regulations to implement inhouse standards to improve our environmental performance.

We commit ourselves to the safe operation of all our working habits, be it in classrooms, library, canteen, on road, off road, in-campus out-campus as well as at our place of stay.

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We endure to ensure that we recognize the essence of this Energy policy by actively and aggressively conducting workshops and training to all in environmental concepts.

We make wide ranging social contribution to close association with the students, teaching staff, administrative staff, housekeeping staff by disclosing environmental information and supporting environmental consumption.

Principal

DAY'S PLEDGE TO LEAVE THE ENVIRONMENT NEAT AND CLEAN.

(Indicative templet for display at all prominent areas, classrooms, waiting rooms, canteen, library, relaxing areas in the campus.)

We, The Principal, staff and students, adopt responsible practices in our day's activities with due regard to the environmental safety aspect. We pledge to place the waste in designated areas and baskets placed. Stop water leakage. Avoid using electrical power where not needed. We also pledge to use judiciously the electrical power by using Energy efficient products. We shall practice to switch off all appliances when not in use.
We will speak to atleast one person in the society daily on use of electrical energy.

PURPOSE:
To realistically and comprehensively reduce energy consumption, assure acceptable indoor air quality, and improve energy efficiency on campus through methods that are consistent with a safe, secure, and inviting campus community. As outlined in this policy, energy conservation will be accomplished by developing a proactive and progressive approach to providing energy efficient, responsible, and cost-effective operations on campus. This policy will be reviewed and updated periodically as public awareness, management techniques, and technologies change.

APPLIES TO: Faculty, staff, students, and visitors.

CAMPUS: AVVP Samithi's, Shri Annadaneshwar Arts, Science and Commerce College. Naregal,

ACKNOWLEDGEMENT:

SUNSHUBH TECHNOVATIONS PVT LTD., is pleased to express its sincere gratitude to the management of AVVP Samithi's, Shri Annadaneshwar Arts, Science and Commerce College. Naregal, Dist:Gadag, Karnataka, for entrusting SUNSHUBH TECHNOVATIONS PVT LTD., with the assignment on Green Earth practices based on Educate, Practice, Advocate & Manage the resources in their educational organization.

We also wish to thank the officials and the maintenance staff for the help rendered during the energy flow study. We would fail if we neglect to appreciate the sincere efforts put in by the 7th Criteria Team lead by the able and motivating Principal Prof Prof. S G Keshannavar and the students who against all odds have kept the college premises clean to the possible limits. Without the crucial and significant support from the fellow teaching team the energy savings and carbon footprint reduction would not be a reality.

With the motivational support of the management, ground realistic support from teaching team and sincere efforts of the students in incorporating the change (habits) and instructions, the college could effectively declare the reduction in Carbon footprint and optimize the waste reductions.

We are not in a position to compute the carbon foot print at this point of time as the basic information from each of the students is yet to be collected; however, we will discuss the Carbon Foot print in the follow up compliance report.

Wishing the team, a great success we deeply express our gratitude and heartfelt "THANKYOU" for allowing us to assess the energy flow scenario there by the ENERGY STATUS.

We acknowledge the involvement of Criteria Coordinator and supporting team.

Name	Designation
Prof. S G Keshannavar	Principal
Prof Dr. M R SHivaram	IQAC Coordinator
Dr. R. R. Patil	Co-ordinator Criteria 7

Dr. D.L. Pawar	Co-ordinator Criteria 1
Prof R. G. Pawar	Co-ordinator Criteria 2
Prof G. G. Koti	Co-ordinator Criteria 3
Dr. Kallayya S. Hiremath	Co-ordinator Criteria 4
Prof Sandeepkumar B	Co-ordinator Criteria 5
Dr. Ravi C. S.	Co-ordinator Criteria 6

Mallikarjun A. Kambalyal. B.E.(E&C).
Certified Energy Auditors (EA-3485)
SUNSHUBH TECHNOVATIONS PVT LTD.,

ENVIRONMENT AUDIT COMPLETION CERTIFICATE

riteria 7.1.6

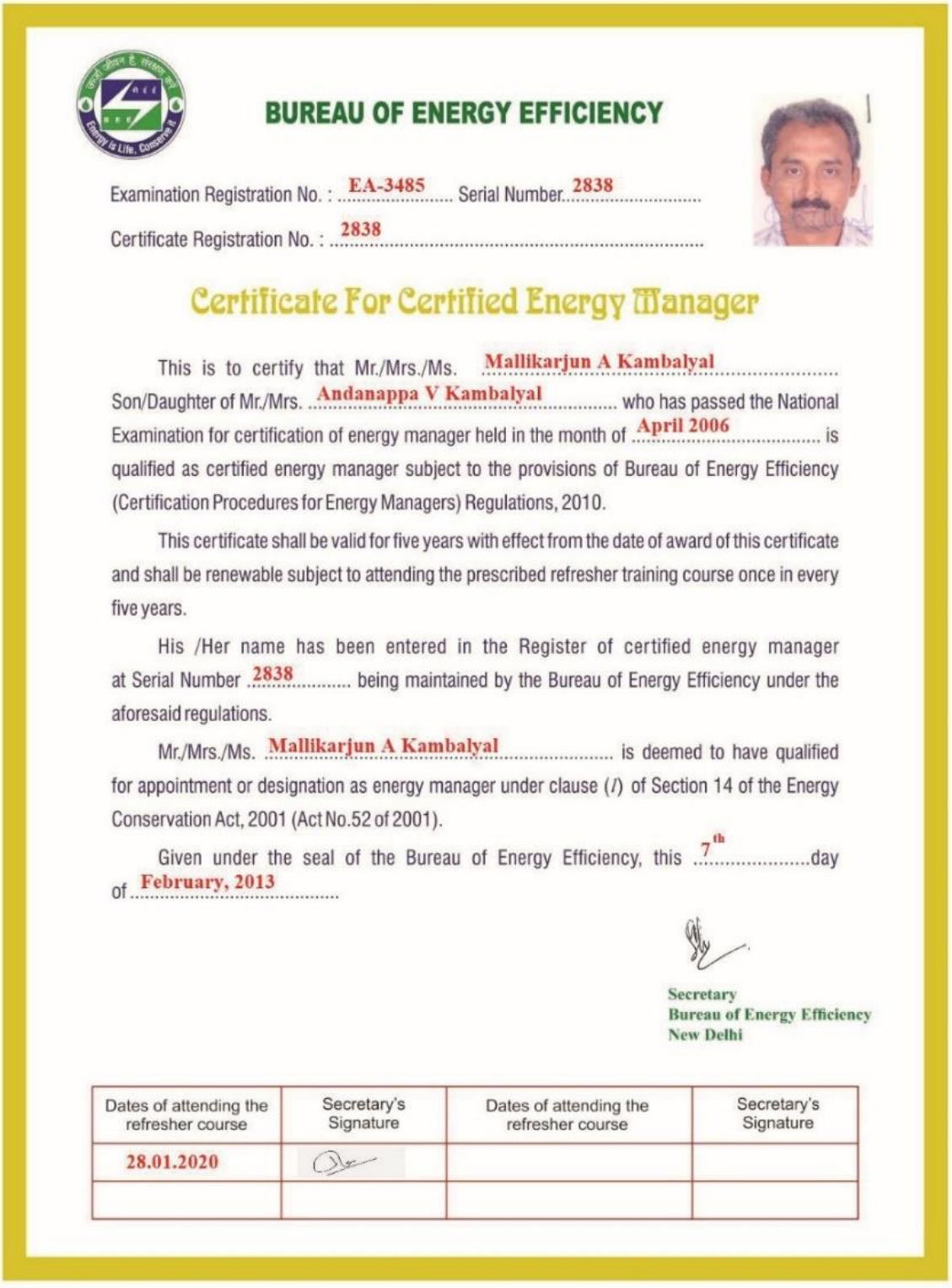
I, Mallikarjun A Kambalyal, endorse and confirm that the Environment Audit has been carried out on 16th May 2022 under the instructions of Prof. Prof. S G Keshannavar Principal for AVVP Samithi's, Shri Annadaneshwar Arts, Science and Commerce College. Naregal, Dist:Gadag, Karnataka. This report is generated based on the site visits and evidence collected from the site.

All attempts have been made to evaluate the scope for development and inculcate green practices in the campus and extended throughout the campus. The focus is also laid to make positive impact on the society for a better living.
I also confirm and sign this certificate, in case the institution needs demonstration, my team of professionals shall be happy to do so.

We present this report to much more than the legal or mandatory compliances. This report is tabled in two parts. The first forms the core discussions which are general in nature. The second section is subject specific under the statutory requirements of the NAAC accreditation norms. They are Audit reports on, Green aspects, Energy aspects, Environment aspects, Health aspects and the discussions on net CARBON FOOTPRINT & the CARBON HANDPRINT initiatives.

Any modifications, changes, omissions after the site visit shall be exclusive.

Authorised Auditor.
Mallikarjun A. Kambalyal B.E (E&C)
Certified Energy Auditors EA-3485& ISO 50001:2011 & ISO14001:2015 Lead Auditor.



BUREAU OF ENERGY EFFICIENCY

Examination Registration No. : EA-3485 Serial Number 2838

Certificate Registration No. : 2838

Certificate For Certified Energy Manager

This is to certify that Mr./Mrs./Ms. Mallikarjun A Kambalyal Son/Daughter of Mr./Mrs. Andanappa V Kambalyal who has passed the National Examination for certification of energy manager held in the month of April 2006 is qualified as certified energy manager subject to the provisions of Bureau of Energy Efficiency (Certification Procedures for Energy Managers) Regulations, 2010.

This certificate shall be valid for five years with effect from the date of award of this certificate and shall be renewable subject to attending the prescribed refresher training course once in every five years.

His /Her name has been entered in the Register of certified energy manager at Serial Number 2838 being maintained by the Bureau of Energy Efficiency under the aforesaid regulations.

Mr./Mrs./Ms. Mallikarjun A Kambalyal is deemed to have qualified for appointment or designation as energy manager under clause (*l*) of Section 14 of the Energy Conservation Act, 2001 (Act No.52 of 2001).

Given under the seal of the Bureau of Energy Efficiency, this 7th day of February, 2013

Secretary
Bureau of Energy Efficiency
New Delhi

Dates of attending the refresher course	Secretary's Signature	Dates of attending the refresher course	Secretary's Signature
28.01.2020			

Figure 2 - Bureau of energy Efficiency Regd No: EA3485

Certificate of Successful Completion

Intertek

This is to Certify that

MALLIKARJUN A KAMBALYAL

has successfully completed the

Intertek

CQI & IRCA Certified ISO 14001:2015
Auditor Conversion Training Course

The Course includes the assessment and evaluation of Environmental Management Systems to conform to the requirements of ISO 14001:2015 and ISO 19011:2011

This course is certified by the Chartered Quality Institute (CQI) and the International Register of Certificated Auditors (IRCA)
– IRCA REFERENCE 18093 –

The course meets the training requirements for individuals seeking certification under the IRCA Auditor Certification Schemes

CQI | IRCA
APPROVED TRAINING PARTNER

Authorising Signature: Vyara Stoimenova

Course Dates: 14th – 16th July 2017 *Certificate Number: 47730*

Membership Application To Be Made Within 3 Years From Last Day of Course

121807

Figure 3 - ISO Certified Lead Auditor. Certificate No: 47730

Figure 4 - ISO Certified Lead Auditor. Certificate No: ENR-00253448

TÜVRheinland®
Genau. Richtig.

Teilnahmebescheinigung

Mr. Mallikarjun Andanappa Kambalyal

has successfully completed the

Manager Training Programme of the Federal Ministry of Economics and Technology

Germany, September 02 – 28, 2013

Energy Efficiency in Industrial Enterprises

Cologne, September 28th, 2013

Dr. Steffi Artl
(Geschäftsführerin)

Hubert Smarowos
(Geschäftsführer)

TÜV Rheinland Akademie GmbH • Alboinstr. 56 • 12103 Berlin

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Figure 5 - Manager training programme, Germany

Manager Training Programme

Federal Ministry of Economics and Technology

giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

Certificate

Fit for Partnership with Germany

Mr Mallikarjun Kambalyal

has successfully participated in the

Manager Training Programme of the Federal Ministry of Economics and Technology with India

from September 2 to September 28, 2013 in Germany.

The programme was carried out by the TÜV Rheinland Akademie, Cologne.

The Manager Training Programme is funded by the Federal Ministry of Economics and Technology of the Federal Republic of Germany. GIZ is the general manager and coordinator of the programme.

Bonn, September 2013

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

Reimut Düring
Head of Manager Training Programme
GIZ – Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH

Christina Otto
Senior Project Manager
GIZ – Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH

Figure 6 - Fit for partnership with Germany

ABOUT THE INSTITUTE.

AVVP Samithi's, Shri Annadaneshwar Arts, Science and Commerce College. Naregal, Dist:Gadag, Karnataka, is a centre for excellent learning, it is founded in the year 1966 with a vision to provide quality education for the empowerment of the rural youth and to promote human excellence.

The college is located in the rural area in Gadag District of Karnataka State. The campus is spread over black cotton soil in an area of 11.2 acres. Institute provides education in Arts, Science and Commerce stream.

ONGOING STATUS:

It's an optimistic & highly dedicated team effort lead by the Principal & the senior staff who have dedicated all their wits & free time to initiate Green Carpet the entire college premises. It is also a fact that there do exist few short comings which however is unintentional & on being trained & educated the campus should look for continued minimized waste generation. With all due appreciation to the management, staff involved & cooperation by the students, we have made few suggestions which on implementation, will reduce, demand for water & electrical power. It will also reduce the existing level of pollution to bear minimum.

NO WASTE – NO POLLUTION – NO HEALTH HAZARD.

WHY IS THIS AUDIT BEING CARRIED OUT?

Why it's important to have an Environment Audit?
Whether you own or manage a small business, a large commercial facility, or a manufacturing operation, it's important to take advantage of any tips, programs and incentives that will help you save money on your energy bills. There are measures that will generate savings to positively impact your bottom line immediately, as well as longer-term strategic initiatives to assess your needs and stabilize your energy spend in the longer term – which is great news for your budget!
One such initiative is an environment audit. Environment audits reveal your usage patterns, identify waste, over-expenditure and, generally, make you fully cognizant of where your resources are under or mis utilised. This knowledge will enable you to be more efficient and be able to track and accelerate savings. Audits may sound expensive or complicated, but they are rewarding and are easier than you think.

WHAT IS AN ENVIRONMENT AUDIT?

An environment audit is an analysis of a facility, indicating how and where the facility is being abused and cut costs. Its insight to energy efficiency and conservation can lead to significant savings on the company's utility bill.

WHY SHOULD YOU GET AN ENVIRONMENT AUDIT?

Resources costs are soaring and your business can be at considerable risk if you do not take the guesswork out of your energy usage and the budget you need to cover it. Environment audits identify where your business is wasting energy. Residential and commercial properties account for around 10% of carbon emissions in the US, according to the EPA, which means they are very inefficient and waste huge amounts of energy and… revenue. An energy audit helps by revealing just how and where energy is being wasted. With thousands of commercial energy customers nationwide, we are well-qualified to advise you on which methods are best used for reducing energy waste and overall energy consumption. Let's start with a simple free evaluation of your bills and show you how we have been found to save between 5% and 35% for many of our customers.

In the case of energy, less is more. Lower energy consumption equals lower energy costs. And, of course, less energy consumption is obviously good for the environment.

As you can see, to be truly effective, energy and environment management requires a strategy just like the other aspect of your operation and measures to curb costs can be simple and in some cases free. Gaining more control over your energy costs will improve the general health of your budget. Not only that but reducing your CARBON FOOTPRINT is great for the environment too!

ENvironment AUDIT OBJECTIVES.

Energy Audit was initiated in the beginning of 1970's, with the motive of inspecting the work executed within an organization, whose exercises could cause risk to the health of inhabitants and the environment. It exposes the genuineness of the proclamation made by the organisation with the concern on health issues. As a consequence of their operations with respect to environmental pollution it is the duty of the organisation to carry out the green audit of the ongoing processes for various reasons, such as,

- To make sure whether one is performing in accordance with the relevant rules and regulations,
- To improve the procedures and aptness of material in use,
- To analyse the potential duties and to determine a way which can lower the cost and to the revenue.

Through green audit one gets adoration as to how to improve the condition of the environment. There are various factors that were forced upon and determine the growth of/or conduct of green audit. Incidents like,

- Decades old Bhopal gas tragedy, that has left its residual effect which still haunts us.
- Our buildings catching fire due to various reasons,
- Industries blowing off taking valuable human lives etc
- People going sick, feeling tired, after long hours of operations in the organization,
- Increased demand of generators due to inconsistent power supply, which has resulted or lead into recent floods and droughts,

are some of the situations to ponder about!

To address various issues in context with human health, green audit is assigned to "Criteria 7" of NAAC (National assessment and accreditation council)

accreditation. NAAC is a self-governing organization in India that declares the institutions as Grade "A++", "A+", "A", Grade "B", …. according to the scores assigned at the time of accreditation.

The other intention of organising green audit is to update the environment conditions in and around the institutions i.e., within the compound and outside the compound. It is carried out with the aid of performing certain tasks like waste management, energy consumed, diesel burnt it performing the objective of the organization. Lastly to self-assess the net carbon footprint of the conduct of process in the organization.

THE GOALS OF AUDIT

The purpose of carrying out Environment & Green audit is

- Securing the environment and cut down the threat posed to human health.
- To Make sure that rules and regulations are complied with.
- To avoid the environmental interruptions that are more difficult to handle and their corrections call for high cost.
- To suggest the best protocol for adding to sustainable development.
- To execute the process of the organisation utilising minimum natural resources.
- Efficient use of those resources contributing to minimum waste generation.

How is the green audit conducted?

- Pre-audit
- Planning
- selecting the team of auditors both internal and external
- schedule the audit facility
- acquire the background information
- visit areas under audit
- On site conditions.

UNDERSTAND THE SCOPE OF AUDIT

- Analyse the strengths and weaknesses of the internal controls
- Conduct audit with focused end user comfort and making it easy to perform.
- Collect necessary evidence so that the stakeholders stand to understand how and where they are going wrong in the process of their conduct.

- Post audit draw the report based on the data collected.

On confirmation of the preliminary report, draw a final report of the observations and inference with accuracy more near to implementable way.

Discuss various remedial measures for alternatives if required.

- Prepare an action plan to overcome the shortcomings with continual observation on the action plan initiated.
- Steps under green audit
- Water is one of the cheapest commodities next to the Air we breathe. Although we Indians, use less water in comparison to western countries. However, the extent of pollutants that we leave behind has polluted all the resources including the deep well.
- Rainwater harvesting is one of the best techniques that can be adopted by harvesting the rainwater and using it at the time of scarcity. the audit team to observe and investigate the relevant methods that can be adopted and implemented and draw the balance of use of water.
- The point of generation of waste, the type of waste generated, i.e., hazardous, recyclable and organically compostable wastes and segregating method at the point of generation for easy and best way to handle the same.
- Evaluating such methods to minimise the use of resources in the process of their management.

It deals with use of energy in the conduct of the process. The priority is topmost for conservation over efficiency; hence, energy auditor should always consider potential operations that can be executed without the use of energy or minimised if necessary. At best it can be used judiciously.

Audit analyses air quality, noise level and the programs undertaken by the institution for plantation creating awareness of trees around us and how nature provides us with remedial measures within its framework.

In the process of use of resources and conduct of the activities, they can develop impact on human health, that might be off minutely harmful, cause permanent disorder or may even cause death. Occupational health hazards are discussed in detail and the stakeholders are informed of the same and required necessary remedial measures indicated.

To make an organisation net zero, near to net zero carbon emission. Use of renewable resources including energy such as solar wind biogas geothermal energies are put into ooh utilisation.

The net impact, all the above audits should be to make an organisation contribute zero emissions which are caused by use of water, generation of waste, use of energy, environmental damage, health damage. Finally, to explore if the campus can go in contributing to third-party emissions minimisation.

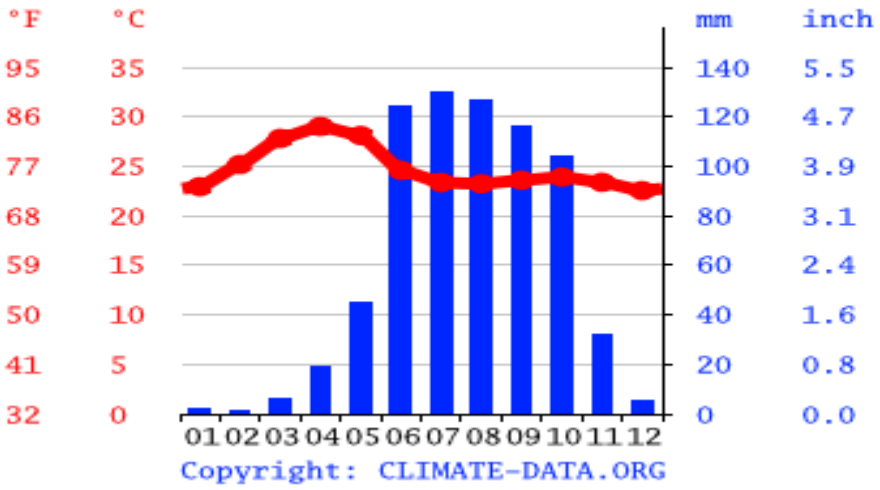
To draw home the benefits, the system has been separated out into various audits as listed above. In doing so, and if audit findings are effectively implemented there are many advantages that can be practised in the process

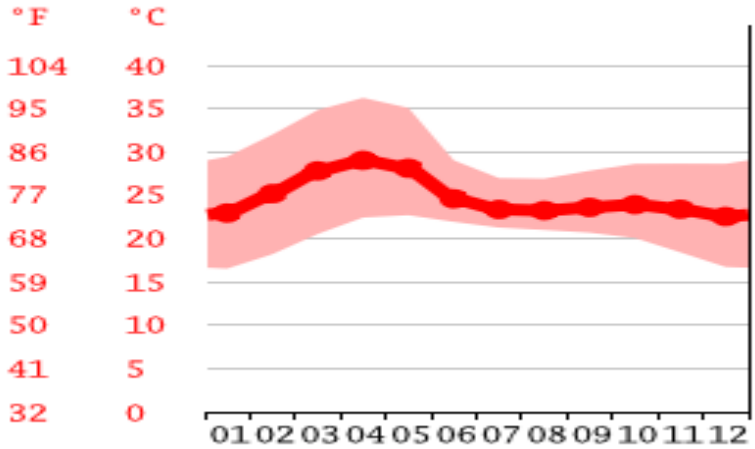
- Recognise the cost saving methods through waste minimising and managing technologies.
- Point out the prevailing and forth coming complications.
- Authenticate conformity with the legal requirements.
- Empower the organisation to frame a better environmental performance.
- Portray a good image of the institution which helps build better relationships with the group's organisations, stakeholders in and around its operations
- Enhance the alertness for environmental guidelines duties and conduct of preparedness for any eventualities due to environmental disasters.
- proposed)
- Indicative templet for display at all prominent areas, classrooms, waiting rooms, canteen, library, relaxing areas in the campus.

GEOGRAPHICAL CONSIDERATIONS:

Before we present our report, the factors that are considered for positive impact recommendations are,

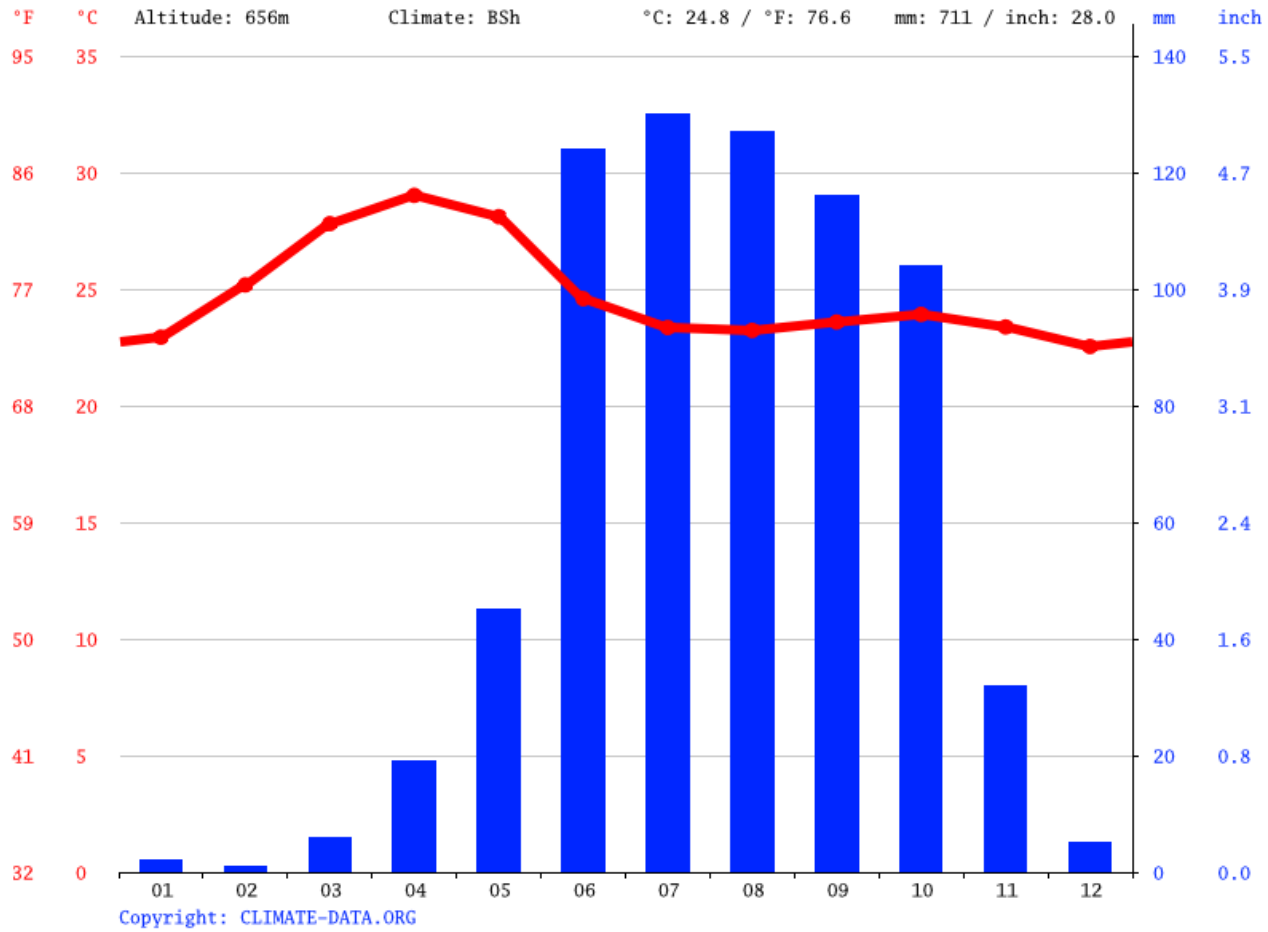
CLIMATE GADAG (INDIA)





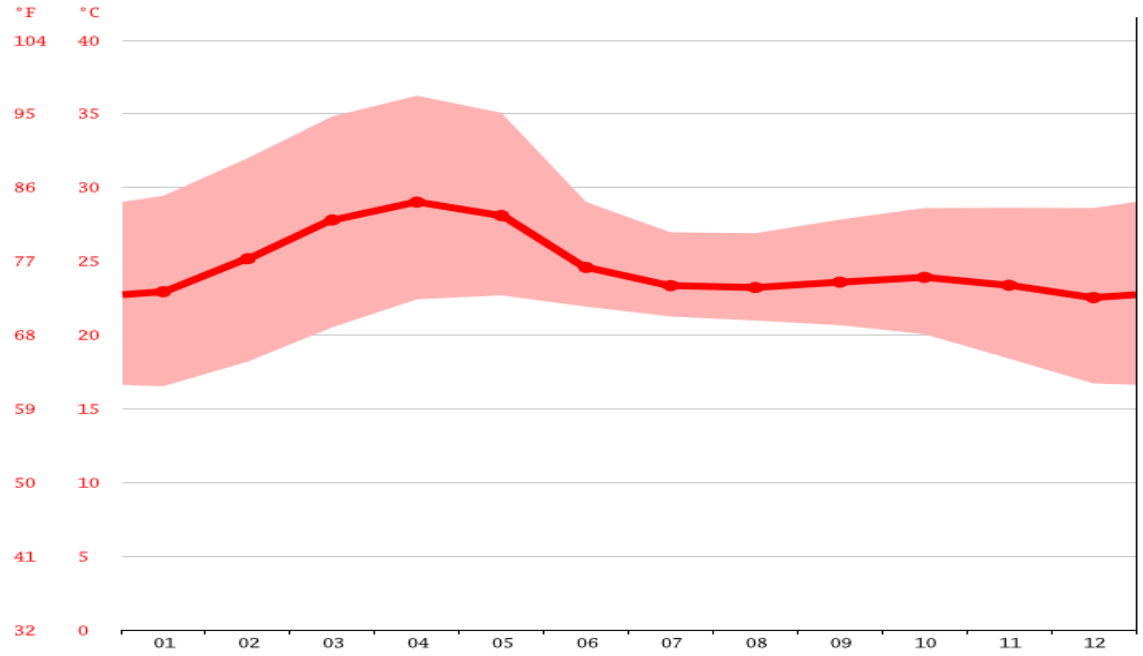
Gadag's climate is a local steppe climate. There is little rainfall throughout the year. The Köppen-Geiger climate classification is BSh. The average annual temperature is 24.8 °C | 76.6 °F in Gadag. About 711 mm | 28.0 inch of precipitation falls annually.

CLIMATE GRAPH // WEATHER BY MONTH GADAG



Precipitation is the lowest in February, with an average of 1 mm | 0.0 inch. The greatest amount of precipitation occurs in July, with an average of 130 mm | 5.1 inch.

AVERAGE TEMPERATURE GADAG



At an average temperature of 29.0 °C | 84.2 °F, April is the hottest month of the year. The lowest average temperatures in the year occur in December, when it is around 22.5 °C | 72.6 °F.

WEATHER BY MONTH // WEATHER AVERAGES GADAG

	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Avg. Temp in °C	22.9	25.2	27.8	29.0	28.1	24.6	23.4	23.2	23.6	23.9	23.4	22.5
Min. Temp in °C	16.5	18.2	20.5	22.4	22.7	21.9	21.3	21.0	20.7	20.1	18.4	16.7
Max. Temp in °C	29.4	32.0	34.8	36.2	35.1	29.0	27.0	26.9	27.8	28.6	28.6	28.6
Precipitation / Rainfall in mm	2	1	6	19	45	124	130	127	116	104	32	5
Humidity(%)	44%	38%	36%	46%	57%	77%	82%	81%	79%	71%	58%	50%
Rainy days (d)	1	0	1	3	6	14	16	16	11	10	3	1
avg. Sun hours (hours)	9.8	10.3	10.7	11.0	10.5	7.1	6.3	6.0	6.7	8.1	8.7	9.1

Between the driest and wettest months, the difference in precipitation is 129 mm. The variation in temperatures throughout the year is 6.5 °C.

The month with the highest relative humidity is July (81.53 %). The month with the lowest relative humidity is March (35.89 %).

The month with the highest number of rainy days is July (21.73 days). The month with the lowest number of rainy days is February (0.40 days).

Gadag in the middle and the summers are that easy to define.

The best time to visit are January, February, March, June, July, August, September, October, November, December.

COURTESY : https://en.climate-data.org/asia/india/karnataka/gadag-24177/
The variation in the precipitation between the driest and wettest months is 536 mm | 21 inches
h. During the year, the average temperatures vary by 5.9 °C | 42.6 °F.
The temperature in Belagavi is, 5 months above 30(°C), 3 months above 29(°C) and 4 months below 29(°C). However, the minimum temperature has never exceeded 21°C. Indicating that the temperature has been very pleasant all over the year except reaching peak during the noon hours.

LIMITATIONS:

Our recommendations are in the interest of conservation of Electrical Energy and Green Culture i.e. the reduction in CARBON FOOTPRINT. The compliance to the recommendations will be subjected to meeting the safety and Environmental rules and guidelines.

PART 2 -TECHNICAL

DISCUSSIONS ON EXECUTIVE SUMMARY:

Aerial View of the College Campus.

Figure 7 - Satelite view of the Academic block

It is also prominently exhibited in all prominent places. Aerial view indicates that the management has shown keen interest in providing the amenities and is focusing on keeping the campus green there by the cool environment within the boundaries of the college.

Image : courtesy, Google Earth Pro, 16.408037° 74.376359°

Figure 8 - Aerial view of campus

The observations are drawn from the site visits and aerial survey of the campus when the corrective measures are discussed.

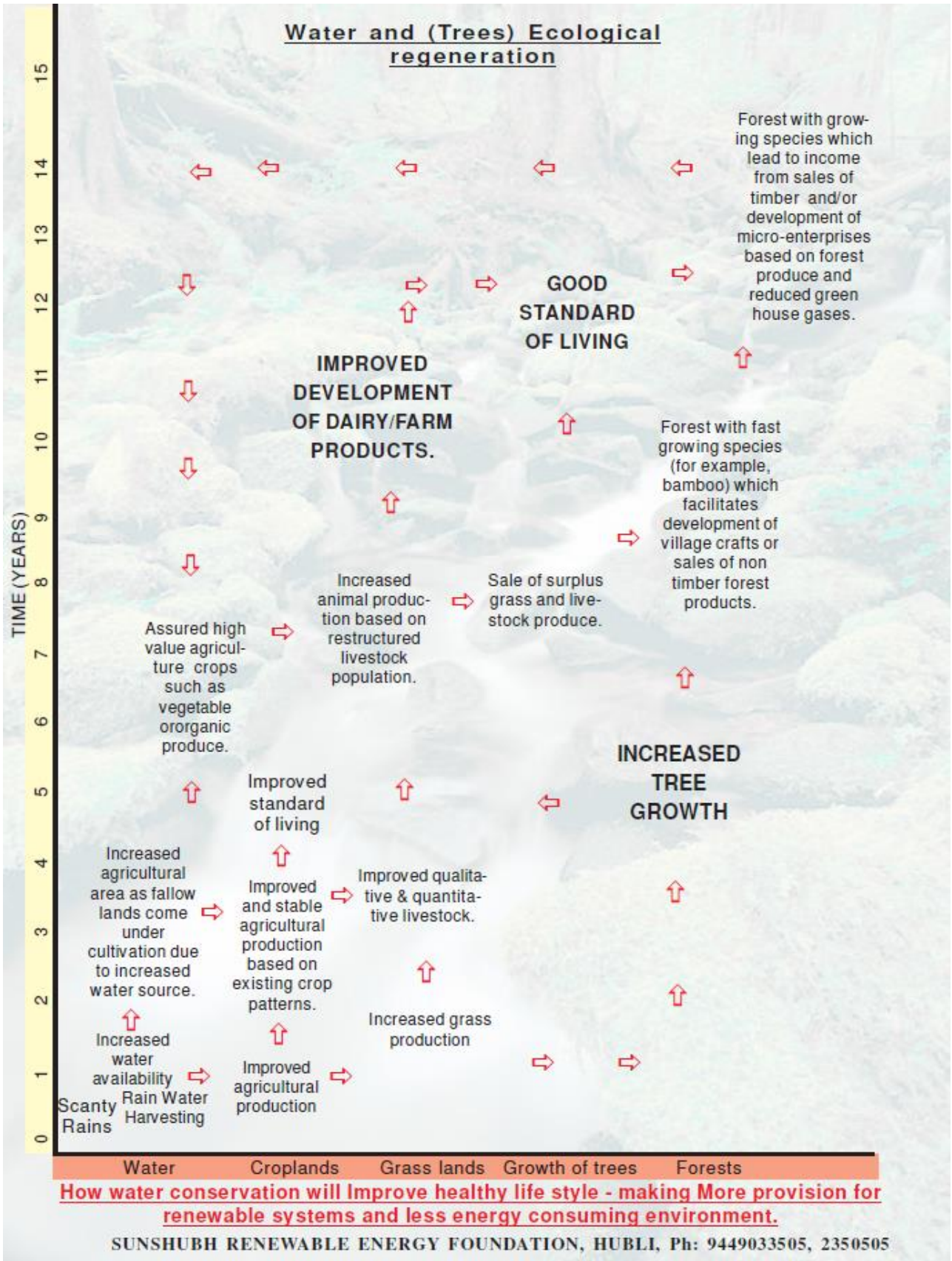


Figure 9 - Regeneration of ecology

NOT BURNING OR UPROOTING THE GRASS – SUPPORTS THE FOREST GROWTH.

PLACING OF WASTE COLLECTION BINS.

Figure 10 - absence of waste collection bins in the corridor

It is important to implement the measure for imparting sense of responsibility and good civic sense.

Considering human tendency, not to walk the distance, the waste collection bins should be placed before every room for ease of handling and convenience. Once the people get to the habit the waste collection will automatically be self-driven.

Few options are provided. The management can select the method based on cost factor.

If the rural technology is opted, the colour code need to be maintained.

If sufficient bins are placed before every room with colour code i.e., Green bins for organic and compostable waste. Yellow/Red for non-compostable wastes. (The management may choose to have any colour options as required) the manpower required to clear the same will be reduced as well.

These locally sourced bins may be placed all along the campus.

We suggest that these bins be colour coded to segregate the waste at source.

This option may look to be off the date. It should be important in placing a small placard as to why hand sewed bins are being put to use.

- **The biggest being the empowering the rural youth in being economically self-sufficient and promoting ethnic skills.**
- Bins are organic and biodegradable. Hence do not contribute to the carbon emissions. Leading to a very innovative Carbon Handprint initiative.
- Readily visible and easy to empty when half full.

Figure 11 - Local soursed waste collection bin

WATER MANAGEMENT.

In most of the institute's, Water tank is located on the top floor. Water is drawn from the tank for meeting the gardening requirements.

The images shown are typical methods followed by many of the gardeners for watering the lawns.

Figure 12 - Watering the lawn

Figure 13 - Watering the lawn

Water is money. Water is Energy and water is life. Judicious use of water is crucial considering the availability of water we suggest that the team of gardeners get educated on…

How we should water, How much should we water, How often should we water and when to stop watering are few check points.

Proper watering is crucial to having the best-looking lawn on the block. Here are some key points:

Since we reside in tropical zone, it is important that we operate the sprinklers after sunset to avoid evaporation and allow the water to percolate deep into the top soil.

Figure 14 - Sprinkler, Consumer much less water and time.

- Lawn needs *at least* 1"-1 ½" of water per week, year-round, during the winter, too.
- It's important to retain moisture content hence, Water deeply 2-3 times per week, rather than daily.
- Watering early in the morning also is favoured, when possible.
- We will need more water during the day hours.
- Should not water the lawns for so long that, water runs down.
- It is important to have automatic sprinklers and also to check them regularly to be sure that we get complete coverage. Going a step further, one can place the moisture sensor and automate the operation of sprinklers if one can afford the system.

BATTERY MANAGEMENT:

Placing the batteries is the beginning of prolonging the life. It is important to increase the life of batteries than regenerate.

The batteries regeneration if incorporated, can also be a revenue earning model for the college by educating the students and training them by undertaking third party batteries for re-generation.

This also takes the institute to reducing its Carbon Footprint and closely interacting with the Industries, other educational institutes and the society at large.

Figure 16 - Placement of battery without ventilation

First is to enhance the life of these batteries by properly placing them.

All batteries should be placed in well ventilated area. As battery disposal is turning out to be a serious issue, ways to prolong the life of the batteries is very important from the environmental point and also from the Financial implications. We will elaborate on why and how batteries underperform and/or fail much before the expected life tenure.

What is Galvanic Corrosion?

Galvanic corrosion is caused by self-induced current created by electrical potential of two dissimilar metals in contact with an electrolyte. It can occur when two dissimilar metals (such as copper tube and steel pipe) are connected in the presence of an electrolyte. Water is a weak electrolyte. ie When Two Dissimilar Metals

Come Into Contact - Electrolysis Occurs , Causing Corrosion - Rusting Of Both Surfaces.

The similar case is present in the college battery bank. It is obvious that the battery discharges by itself at all times when charged.

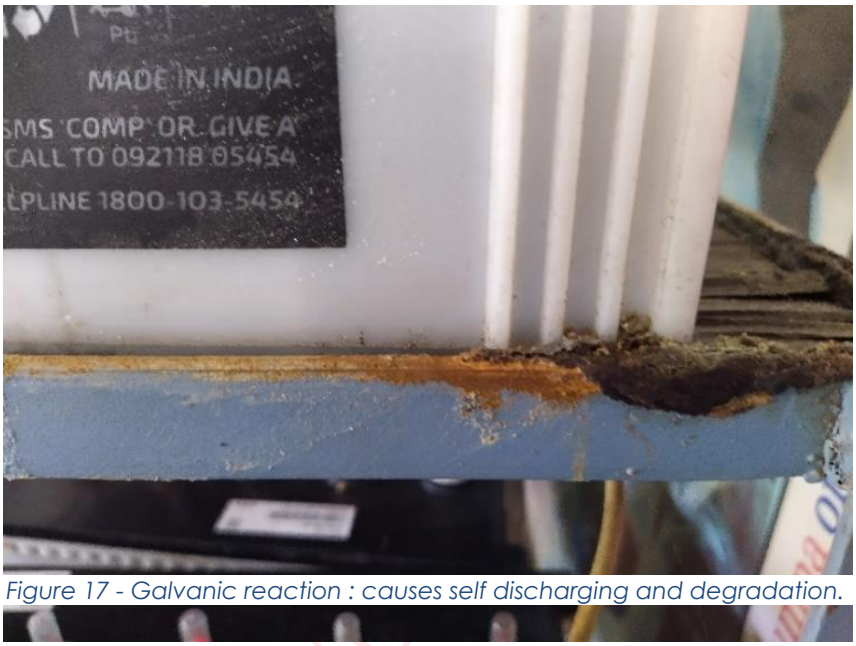
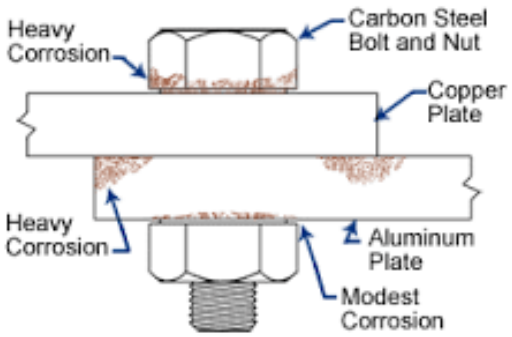


Figure 17 - Galvanic reaction : causes self discharging and degradation.

How do we prevent Galvanic Corrosion - Electrolysis from occurring?

The quickest way to prevent Galvanic Corrosion or Electrolysis from occurring is to place two batteries away from each other without physical contact.



Effects of Galvanic Corrosion

It is also required to prevent batteries resting or coming in contact with metal stand supports.

Placing the batteries on an insulated mat will be an added advantage.

We will discuss the regenerative system of used and week batteries to enhance the life. It is important to know few points on handling of batteries. BU-703: Health Concerns with Batteries

Become familiar with the do's and don'ts when handling batteries.

Batteries are safe, but caution is necessary when touching damaged cells and when handling lead acid systems that have access to lead and sulfuric acid. Several countries label lead acid as hazardous material, and rightly so. Lead can be a health hazard if not properly handled.

Lead

Lead is a toxic metal that can enter the body by inhalation of lead dust or ingestion when touching the mouth with lead-contaminated hands. If leaked onto the ground, acid and lead particles contaminate the soil and become airborne when dry. Children and foetuses are most vulnerable to lead exposure because their bodies are developing. Excessive levels of lead can affect a child's growth, cause brain damage, harm kidneys, impair hearing and induce behavioural problems. In adults, lead can cause memory loss and lower the ability to concentrate, as well as harm the reproductive system. Lead is also known to cause high blood pressure, nerve disorders, and muscle and joint pain. Researchers speculate that Ludwig van Beethoven became ill and died because of lead poisoning.

By 2017, members of the International Lead Association (ILA) want to keep the lead blood level of workers in mining, smelting, refining and recycling below 30 micrograms per decilitre (30µg/dl). In 2014, the average participating employee checked in at 15.6µg/dl, but 4.8 percent were above 30µg/dl. (Source Batteries & Energy Storage Technology, Summer 2015.)

In 2019, the University of Southern California published the detection of lead in teeth of children living near the Exide Technologies battery recycling plant in Vernon, California

Lead occurs naturally in soil at 15–40mg/kg level. This level can increase multi-fold near lead battery manufacturing and recycling plants. Soil levels in developing countries, including on the continent of Africa, recorded lead contamination levels of 40–140,000mg/kg. (See BU-705: How to Recycle Batteries.)

Sulfuric Acid

The sulfuric acid in a lead acid battery is highly corrosive and is more harmful than acids used in most other battery systems. Contact with eye can cause permanent blindness; swallowing damages internal organs that can lead to death. First aid treatment calls for flushing the skin for 10–15 minutes with large amounts of water to cool the affected tissue and to prevent secondary damage. Immediately remove contaminated clothing and thoroughly wash the underlying skin. Always wear protective equipment when handling sulfuric acid.

Cadmium

Cadmium used in nickel-cadmium batteries is considered more harmful than lead if ingested. Workers at NiCd manufacturing plants in Japan have been experiencing health problems from prolonged exposure to the metal, and governments have banned disposal of nickel-cadmium batteries in landfills. The soft, whitish metal that occurs naturally in the soil can damage kidneys. Cadmium can be absorbed through the skin by touching a spilled battery. Since most NiCd batteries are sealed, there are no health risks in handling intact cells; caution is required when working with an open battery.

Nickel-metal-hydride is considered non-toxic and the only concern is the electrolyte. Although toxic to plants, nickel is not harmful to humans.

Lithium-ion is also benign — the battery contains little toxic material. Nevertheless, caution is required when working with a damaged battery. When handling a spilled battery, do not touch your mouth, nose or eyes. Wash your hands thoroughly.

Keep small batteries out of children's reach. Children younger than four are the most likely to swallow batteries, and the most common types that are ingested are button cells. Each year in the United States alone, more than 2,800 children are treated in emergency rooms for swallowing button batteries. According to a 2015 report, serious injuries and deaths from swallowing batteries have increased nine-fold in the last decade.

The battery often gets stuck in the oesophagus (the tube that passes food). Water or saliva creates an electrical current that can trigger a chemical reaction producing hydroxide, a caustic ion that causes serious burns to the surrounding tissue. Doctors often misdiagnose the symptoms, which can reveal themselves as fever, vomiting, poor appetite and weariness. Batteries that make it through the oesophagus often move through the digestive tract with little or no lasting damage. The advice to a parent is to choose safe toys and to keep small batteries away from young children.

Safety Tips

- Keep button batteries out of sight and reach of children. Remote controls, singing greeting cards, watches, hearing aids, thermometers, toys and electric keys may contain these batteries.

- Similar to pharmaceutical products, keep loose batteries locked away to prevent access by small children.
- Communicate the danger of swallowing button batteries with your children, as well as caregivers, friends, family members and babysitters.
- If you suspect your child has ingested a battery, go to the hospital immediately. Wait for a medical assessment before allowing the child to eat and drink.

Ventilation

Charging batteries in living quarters should be safe, and this also applies to lead acid. Ventilate the area regularly as you would a kitchen when cooking. Lead acid produces some hydrogen gas but the amount is minimal when charged correctly. Hydrogen gas becomes explosive at a concentration of 4 percent. This would only be achieved if large lead acid batteries were charged in a sealed room.
Over-charging a lead acid battery can produce hydrogen sulphide. The gas is colourless, very poisonous, flammable and has the odour of rotten eggs. Hydrogen sulphide also occurs naturally during the breakdown of organic matter in swamps and sewers; it is present in volcanic gases, natural gas and some well waters. Being heavier than air, the gas accumulates at the bottom of poorly ventilated spaces. Although noticeable at first, the sense of smell deadens the sensation with time and potential victims may be unaware of its presence.
As a simple guideline, hydrogen sulphide becomes harmful to human life if the odour is noticeable. Turn off the charger, vent the facility and stay outside until the odour disappears. Other gases that can develop during charging and the operations of lead acid batteries are arsine (arsenic hydride, AsH_3) and (antimony hydride, SbH_3). Although the

levels of these metal hydrides stay well below the occupational exposure limits, they are a reminder to provide adequate ventilation.

Regeneration of week batteries for the Second/Third lease of life.

Significance…

- The early regeneration results into second tenure of the batteries i.e., another term of 3 to 5 years as per Battery specifications.
- Optimised energy consumption. Thus, reduced cost of operation.
- Delayed disposal results into elimination of environment pollution.
- Reduced impact on CARBON FOOTPRINT.

HACCP PRACTICES – GENDER EQUALITY:

Sanitary Pad dispenser :

Figure 18 - Pad dispenser

We appreciate the placement of the sanitary pad dispenser and also being used by the members. One improvement is however needed. The custodian of the pads contact details may be displayed. This should help to draw the attention of the stock holder to replenish the dispenser when empty.

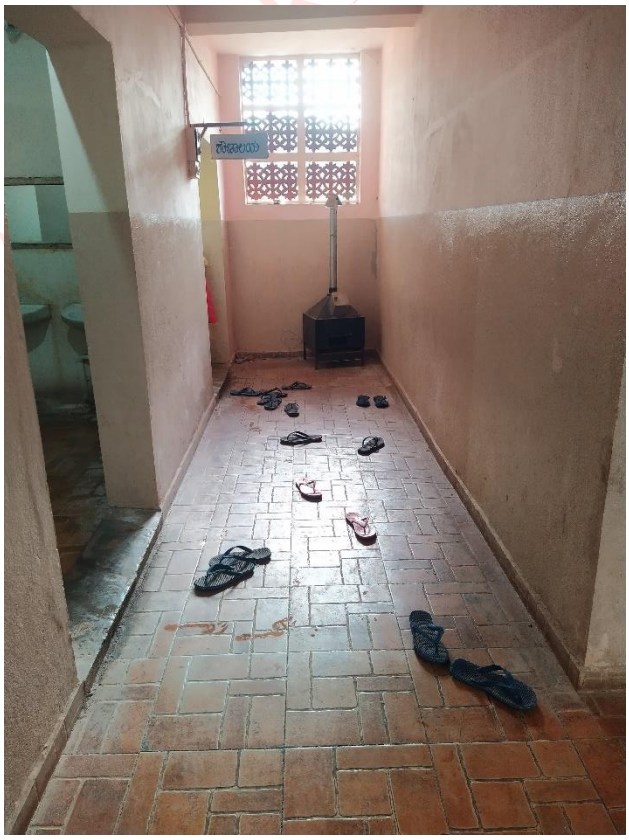


Figure 19 – Non-operating incinerator

Sanitary pad Incinerator:

The pad incinerator is not in operation. The women empowerment committee should be asked to check for all the women comfort necessities. It may be stressed more as a necessity and not as a luxury. It would be important to display the usage instructions in Kannada, Hindi and English so that the members can operate the incinerator by themselves.

FIRE PREVENTION & SAFETY :

The fire extinguishers should be placed at the entrance of the room housing dangerous devices and chemistry lab. So that, they are handy when need to be used.

Figure 20 - No ready access to fire extinguisher.

The detailed information chart on fire extinguishers is to be prominently displayed and all staff should be educated and trained.

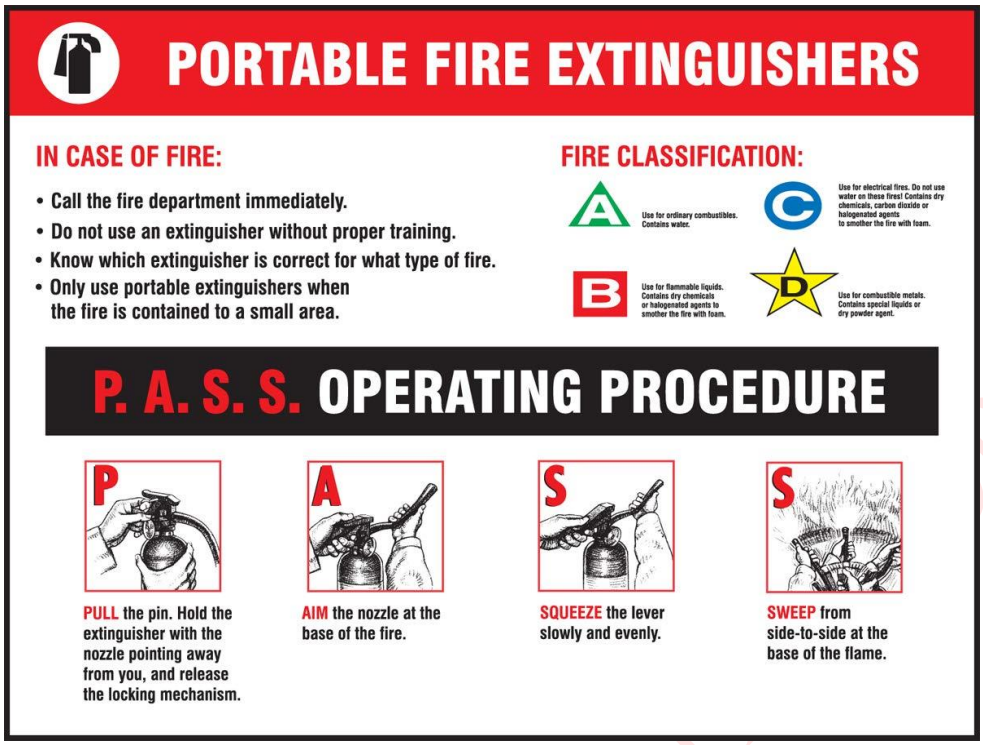


Figure 21 - Fire extinguisher Operating instructions

It is also important that the handling instructions are Predominantly displayed. The sample poster is reproduced for replication.

Type / Extinguisher / Fire	CLASS A Combustible materials (e.g. paper & wood)	CLASS B Flammable liquids (e.g. paint & petrol)	CLASS C Flammable gases (e.g. butane and methane)	CLASS D Flammable metals (e.g. lithium & potassium)	Electrical Electrical equipment (e.g. computers & generators)	CLASS F Deep fat fryers (e.g. chip pans)	Comments
Water	✓	✗	✗	✗	✗	✗	Do not use on liquid or electric fires
Foam	✓	✓	✗	✗	✗	✗	Not suited to domestic use
Dry Powder	✓	✓	✓	✓	✓	✗	Can be used safely up to 1000 volts
CO2	✗	✓	✗	✗	✓	✗	Safe on both high and low voltage
Wet Chemical	✓	✗	✗	✗	✗	✓	Use on extremely high temperatures

Figure 22 - Fire extinguisher : Class

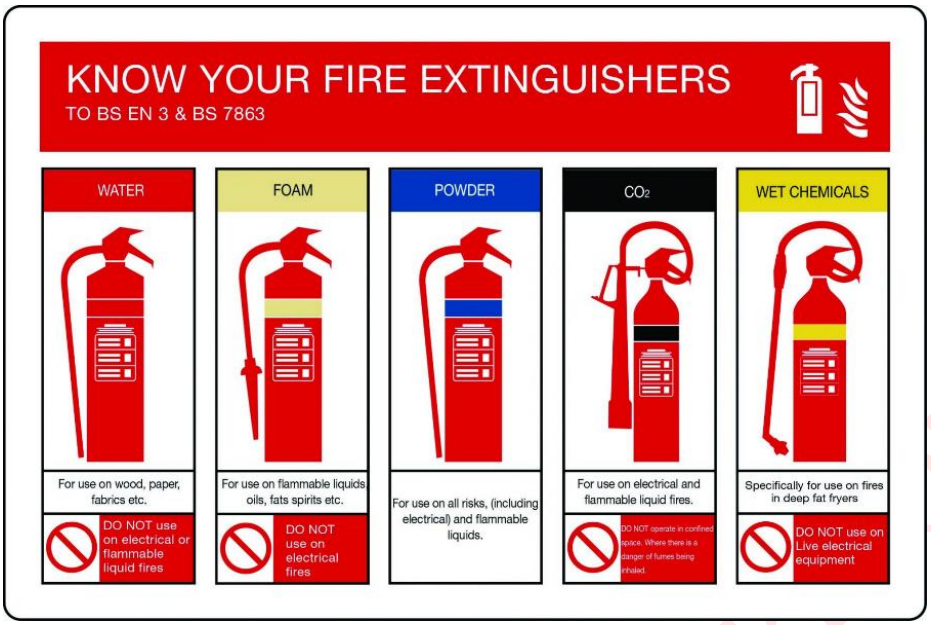


Figure 23 - Types of Fire extinguishers

In case of fire, the appropriate Fire extinguishers should be placed at the entrance but outside the room. The details of such classified Extinguishers is indicated for reference.

PLACEMENT GAS FUEL CYLINDERS:

Figure 24 - Placement of LPG cylinders in wrong location.

The LPG and other high pressure cylinders should be placed outside the room in well ventilated area and not as seen above.

If there is any space constraint, it is necessary that the lowest part of the space should be open and free ventilation provided.

The slope should be leading towards the outer wall and proper bund be made to prevent any leakage flowing into the hall/room/laboratory.

RAINWATER MANAGEMENT.

Laying of rainwater opening pavers.

The rainwater is forced to flow over the pavers and as a result flood the low lying areas.

It may be recalled that, in the previous report, it was suggested to divert the water on to the sides by creating small humps and creating water percolation holes between pavers.

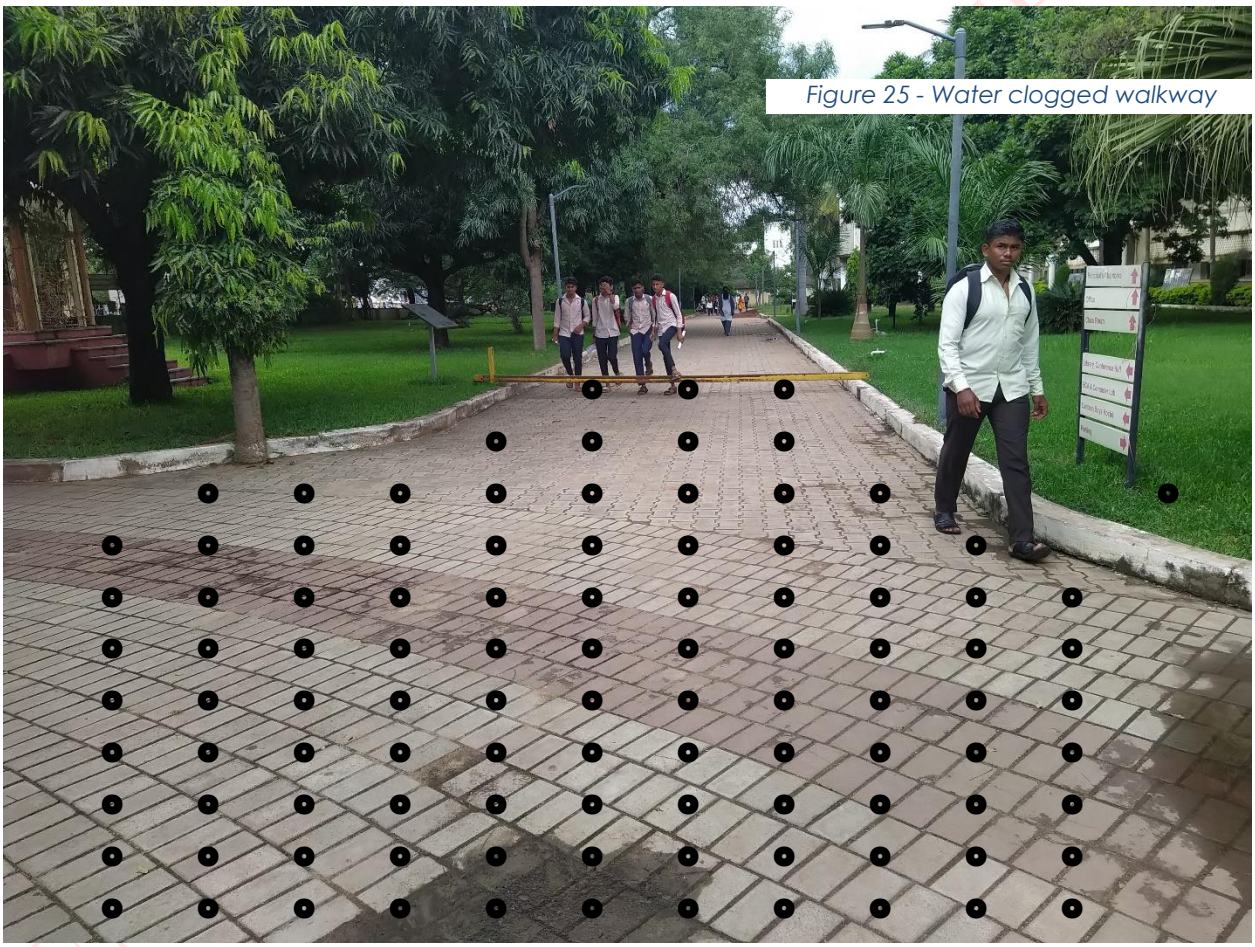


Figure 25 - Water clogged walkway

Creating these provisions will help the surrounding plants to get more water. Watering the subsoil will lead to increased rate of survival and need for less watering during the non-rainy days.

MEDICINAL PLANTATION.

The College has a small and beautiful garden focussed on medicinal and aromatic plants.

Although the college has marked specific area for medicinal plants, the same needs to be brought into order. In the task on hand, we suggest,….

In order to share the significance of the project, It would be adding value, when the information is shared in local language where the visitor understands.

An attempt by one of the college is shown. The same can be reproduced as suitable to the college establishment.

Additionally, similar placard may be posted at the entrance and extending the invitation to the citizens to visit the medicinal garden.

This initiative will take the information to the citizens and can help build dialog.

VERMICOMPOST.

Figure 26 - Vermicompost

The organic waste composting structure has been created, needs the attention of all the stake holders in making it successful. Collective effort will take the initiative to a great and meaningful implementation. The infrastructure is already in place. The compost so formed should be exhibited for the information of the farming community through the children coming to college for education.

The chemical analysis of the organic manure so produced can be carried out by the science stream students and the same can be carried out of the campus.

The experience and pride of discussing the initiatives may be recorded and the same may be projected during the functions and honoured. These initiatives will be a motivators for other students to explore similar opportunities.

Just to quote, The commerce students may take-up a project where the local product say agricultural produce is marketed after value addition in any possible way.

These measures give financial stability to the weaker sections of the society and thus the moral responsibility of the establishment.

A typical working model where one can replicate the rural economy is by managing kitchen waste. This may be used to showcase the ways of developing the vermicompost.

The benefits of vermicompost if exhibited, the children can disseminate the same to their parents back home.

Figure 27 - composted kithchen waste

ROOFTOP : PASSIVE COOLING.

Figure 28 - Algae Parched terrace

The parched rooftop, needs to be white washed so as to avoid roof heating. This should help in keeping the room down below cooler.

The additional benefit of prevention of algae growth also brings about positive change.

Grey Water management.:

Figure 29 - Grey water pond

In today's context, use of soaps and cosmetics has increased multifold. The water that is let out along with the soap and cosmetic chemicals is termed as Grey water. This water is containing valuable chemicals which form micro nutrients to the fertilizers. If this water if left open untreated, would cause foul smell and would be a breeding zone for mosquito and other harmful insects.

It is important to arrest the negative impact and extract the useful nutrients for good use. The botany department can initiate and do some research to come up with first hand experience on benefits of grey water use.

Planting Canna Indica locally known as kaabaali and water hyacinth which is predominantly seen in polluted water ponds are known as water purifying plants. While kaabaali grows in greywater accumulated areas. Water hyacinth grows well in polluted water ponds.

The images of the two plants are reproduced below.

Canna Indica (Kaabaali)

Water Hyacith.

More information can be drawn from the two links below.

https://www.sciencedirect.com/science/article/pii/S0048969719347229

https://www.researchgate.net/publication/323278568_Waste_Water_Treatment_using_Water_Hyacinth

Celebrating national and International days in relation to Environment Audit.

Following is list of important days in India. Some of them only celebrated in World and some in India only as different country have different days for that event.

Day & Month	Celebration.	Reason for celebration
12-Jan	National Youth Day.	National Youth Day, also known as Vivekananda Jayanti, is celebrated on 12 January, being the birthday of a Hindu monk, Swami Vivekananda. In 1984, the Government of India declared this day as National Youth Day and since 1985 the event is celebrated in India every year
24-Jan	Girl child day (In India)	The day was first initiated in 2008 by the Ministry of Women and Child Development. It was celebrated for the first time with an aim to raise awareness about the inequalities faced by girls and women in society at various levels

11-Feb	International Day of Women and Girls in Science	The International Day of Women and Girls in Science is an annual observance adopted by the United Nations General Assembly to promote the full and equal access and participation of women in Science, Technology, Engineering and Mathematics (STEM) fields.[1] The United Nations General Assembly passed resolution 70/212 on 22 December 2015,[2] which proclaimed the 11th day of February as the annual commemoration of the observance.[3] A theme is selected annually to highlight a particular focus and area of discussion around a focus point for gender equality in science. The International Day of Women and Girls in Science is implemented annually by UNESCO in collaboration with UN Women.[4] Both organisations work with national governments, intergovernmental organisations, civil society partners, universities and corporations in order to achieve the shared goal of promoting the role of women and girls in scientific fields and celebrate those already successful in the field.
28-Feb	National Science Day.	National Science Day is celebrated in India on February 28 each year to mark the discovery of the Raman effect by Indian physicist Sir C. V. Raman on 28 February 1928. For his discovery, Sir C.V. Raman was awarded the Nobel Prize in Physics in 1930
6-March	World Energy Efficiency Day	March 6th is World Energy Efficiency Day, which raises awareness of the need to reduce energy consumption and promote sustainable energy use. Finding ways to avoid energy waste - electricity, gas, water - is critical in the fight against climate change as it contributes to emitting less carbon and methane into the atmosphere. As an example, electricity is generated by fossil fuels, like natural gas and coal, but also nuclear energy. Yet, there are simple actions one can take all year long to promote energy efficiency! For example, using daylight hours for tasks that require lighting, turning off lights and electrical devices when not in use, using LEDs, replacing old appliances with class A ones, and prioritizing public transport or cycling!Energy
8-Mar	International Women's Day.	International Women's Day is a global holiday celebrated annually on March 8 as a focal point

		in the women's rights movement, bringing attention to issues such as gender equality, reproductive rights, and violence and abuse against women
21-Mar	World Forestry Day.	The International Day of Forests was established on the 21st day of March, by resolution of the United Nations General Assembly on November 28, 2013
22-March	World Water Day	World Water Day is an annual United Nations (UN) observance day held on 22 March that highlights the importance of fresh water. The day is used to advocate for the sustainable management of freshwater resources.[1] The theme of each year focuses on topics relevant to clean water, sanitation and hygiene (WASH), which is in line with the targets of Sustainable Development Goal 6.[2] The UN World Water Development Report (WWDR) is released each year around World Water Day. UN-Water is the convener for World Water Day and selects the theme for each year in consultation with UN organizations that share an interest in that year's focus.[1] The theme for 2021 was "Valuing Water" and the public campaign invited people to join a global conversation on social media to "tell us your stories, thoughts and feelings about water".
23-Mar	World Meteorological Day.	World Meteorological Day was established in 1951 to commemorate the World Meteorological Organization creation on 23 March 1950. This organization announces a slogan for World Meteorological Day every year, and this day is celebrated in all member countries.
7-Apr	World Health Day.	World Health Day is a global health awareness day celebrated every year on 7 April, under the sponsorship of the World Health Organization (WHO), as well as other related organizations. In 1948, the WHO held the First World Health Assembly. The Assembly decided to celebrate 7 April of each year, with effect from 1950, as the World Health Day.
22-Apr	Earth Day.	Earth Day is an annual event on April 22 to demonstrate support for environmental protection. First held on April 22, 1970, it now includes a wide range of events coordinated globally by EARTHDAY.ORG including 1 billion people in more than 193 countries. The official theme for 2023 is Invest In Our Planet.

25-Apr	World Veterinary Day	The World Veterinary Day (WVD) was established on April 29, 2000, by the World Veterinary Association (WVA). Since then, the last Saturday of April is observed as WVD every year with a new theme that highlights a specific aspect of veterinary medicine.
1-May	Workers Day (International Labor Day).	International Workers' Day, also known as Labour Day in some countries[1] and often referred to as May Day,[2][3] is a celebration of labourers and the working classes that is promoted by the international labour movement and occurs every year on 1 May,[4][5] or the first Monday in May. Traditionally, 1 May is the date of the European spring festival of May Day. In 1889, the Marxist International Socialist Congress met in Paris and established the Second International as a successor to the earlier International Workingmen's Association. They adopted a resolution for a "great international demonstration" in support of working-class demands for the eight-hour day.
3-May	Press Freedom Day.	The United Nations General Assembly declared May 3 to be World Press Freedom Day[1][2] or just World Press Day, observed to raise awareness of the importance of freedom of the press and remind governments of their duty to respect and uphold the right to freedom of expression enshrined under Article 19 of the 1948 Universal Declaration of Human Rights and marking the anniversary of the Windhoek Declaration, a statement of free press principles put together by African newspaper journalists in Windhoek in 1991.
May (2nd Sunday)	Mother's Day.	Mother's Day is a celebration honoring the mother of the family or individual, as well as motherhood, maternal bonds, and the influence of mothers in society. It is celebrated on different days in many parts of the world, most commonly in the months of March or May. It complements similar celebrations, honoring family members, such as Father's Day, Siblings Day, and Grandparents' Day.
8-May	World Red Cross Day.	World Red Cross Day and Red Crescent Day is an annual celebration of the principles of the International Red Cross Day and Red Crescent Day. World Red Cross Day is also known as Red Crescent Day. World Red Cross Day and Red Crescent Day is celebrated on 8 May every year.[1] This date is the birth anniversary of Henry Dunant, who was born on 8 May 1828 at Geneva, Switzerland, and died on 30 October 1910 at Heiden, Switzerland. He was the founder of (ICRC) International Committee of the Red Cross and the recipient of the first Nobel Peace Prize in 1901
11-May	National Technology Day.	The Pokhran-II tests were a series of five nuclear bomb test explosions conducted by India at the Indian Army's Pokhran Test Range in May 1998.[3] It was the second instance of nuclear testing conducted by India; the first test, code-named *Smiling Buddha*, was conducted in May 1974.[4] The tests achieved their main objective of giving India the capability to build fission and thermonuclear weapons with yields up to 200 kilotons.[1] The then-Chairman of the Indian Atomic Energy Commission described each one of the explosions of *Pokhran-II* to be "equivalent to several tests carried out by other nuclear weapon states over

		decades".[5] Subsequently, India established computer simulation capability to predict the yields of nuclear explosives whose designs are related to the designs of explosives used in this test.
15-May	International Day of the Family.	The International Day of Families is observed on 15 May every year. The Day was proclaimed by the UN General Assembly in 1993 with resolution A/RES/47/237 and reflects the importance the international community attaches to families
31-May	Anti-Tobacco Day.	World No Tobacco Day (WNTD) is observed around the world every year on 31 May. The annual observance informs the public on the dangers of using tobacco, the business practices of tobacco companies, what the World Health Organization (WHO) is doing to fight against the use of tobacco, and what people around the world can do to claim their right to health and healthy living and to protect future generations.
5-Jun	World Environment Day.	World Environment Day (WED) is celebrated annually on 5 June and encourages awareness and action for the protection of the environment. It is supported by many non-governmental organizations, businesses, government entities, and represents the primary United Nations outreach day supporting the environment.[1][2] First held in 1973, it has been a platform for raising awareness on environmental issues as marine pollution, overpopulation, global warming, sustainable development and wildlife crime.[3] World Environment Day is a global platform for public outreach, with participation from over 143 countries annually. Each year, the program has provided a theme and forum for businesses, non government organizations, communities, governments and celebrities to advocate environmental causes.
6-Aug	Hiroshima Day.	On 6 and 9 August 1945, the United States detonated two atomic bombs over the Japanese cities of Hiroshima and Nagasaki respectively. The bombings killed between 129,000 and 226,000 people, most of whom were civilians, and remain the only use of nuclear weapons in an armed conflict.
August(1st Sunday)	Friendship day.(In India)	Friendship Day in India falls on the first Sunday of August. Friendship Day honours the meaningful bonds we share with our friends over the course of our life. After all, friendship is one of the most genuine relationship forms, not based on societal expectations, caste, creed, colour,

		age, religion or ethnicity. Friends are the family we choose. They stand up for us in our happiest and saddest moments. A friend not only cheers for us during our achievements, but they also call out our problematic behaviour or give us a shoulder to cry on during hard times. Friendship Day commemorated this special relationship.
9-Aug	Quit India Day and	The Quit India Movement, also known as the Bharat Chhodo Andolan, was a movement launched at the Bombay session of the All India Congress Committee by Mahatma Gandhi on 9 August 1942, during World War II, demanding an end to British rule in India. After the British failed to secure Indian support for the British war effort with Cripps Mission, Gandhi made a call to *Do or Die* in his Quit India speech delivered in Bombay on 9 August 1942 at the Gowalia Tank Maidan. Viceroy Linlithgow remarked the movement to be "by far the most serious rebellion since 1857".
	Nagasaki Day.	On 6 and 9 August 1945, the United States detonated two atomic bombs over the Japanese cities of Hiroshima and Nagasaki respectively. The bombings killed between 129,000 and 226,000 people, most of whom were civilians, and remain the only use of nuclear weapons in an armed conflict. Japan surrendered to the Allies on 15 August, six days after the bombing of Nagasaki and the Soviet Union's declaration of war against Japan and invasion of Japanese-occupied Manchuria. The Japanese government signed the instrument of surrender on 2 September, effectively ending the war.
15-Aug	Independence Day.	Independence Day is celebrated annually on 15 August as a public holiday in India commemorating the nation's independence from the United Kingdom on 15 August 1947, the day when the provisions of the Indian Independence Act, which transferred legislative sovereignty to the Indian Constituent Assembly, came into effect. India retained King George VI as head of state until its transition to a republic, when the Constitution of India came into effect on 26 January 1950
29-Aug	National Sports Day.	The National Sports Day in India is celebrated on 29 August, on the birth anniversary of hockey

		player Major Dhyan Chand.[1] This day marks the birthday of Major Dhyan Chand Singh, the hockey player who won gold medals in Olympics for India in the years 1928, 1932 and 1936. He scored 400 goals in his total career, from 1926 - 1949 (according to his autobiography, *Goals*)
5-Sep	Teachers' Day.	Teacher's Day is a special day for the appreciation of teachers, and may include celebrations to honor them for their special contributions in a particular field area, or the community tone in education. This is the primary reason why countries celebrate this day on different dates, unlike many other International Days. For example, Argentina has commemorated Domingo Faustino Sarmiento's death on 11 September as Teachers' Day since 1915.[1] In India the birthday of the second president Sarvepalli Radhakrishnan, 5 September, is celebrated as Teacher's Day since 1962,[2] while Guru Purnima has been traditionally observed as a day to worship teachers/gurus by Hindus.
8-Sep	World Literacy Day.	International Literacy Day is an international observance, celebrated each year on 8 September, that was declared by UNESCO on 26 October 1966 at the 14th session of UNESCO's General Conference. It was celebrated for the first time in 1967. Its aim is to highlight the importance of literacy to individuals, communities and societies. Celebrations take place in several countries.
16-Sep	World Ozone Day.	International Day for the Preservation of the Ozone Layer (informally and simply called Ozone Day) is celebrated on September 16 designed by the United Nations General Assembly.[1] This designation had been made on December 19, 2000, in commemoration of the date, in 1987, on which nations signed the Montreal Protocol on Substances that Deplete the Ozone Layer.[2] In 1994, the UN General Assembly proclaimed 16 September the International Day for the Preservation of the Ozone Layer, commemorating the date of the signing, in 1987, of the Montreal Protocol on Substances that Deplete the Ozone Layer.[3] The closure of the hole in the ozone layer was observed 30 years after the protocol was signed.[4] Due to the nature of the gases responsible for ozone depletion their chemical

		effects are expected to continue for between 50 and 100 years.
27-Sep	World Tourism Day.	Since 1980, the United Nations World Tourism Organization has celebrated World Tourism Day as international observances on September 27. This date was chosen as on that day in 1970, the Statutes of the UNWTO were adopted. The adoption of these Statutes is considered a milestone in global tourism.[1] The purpose of this day is to raise awareness on the role of tourism within the international community and to demonstrate how it affects social, cultural, political and economic values worldwide.
1-Oct	International day of the Elderly	The International Day of Older People is observed on October 1 each year. On December 14, 1990 the United Nations General Assembly voted to establish October 1 as the International Day of Older People as recorded in Resolution 45/106. The holiday was observed for the first time on October 1, 1991.
3-Oct	World Habitat Day.	World Habitat Day is marked on the first Monday of October each year,[1] and is recognized by the United Nations to reflect on the state of towns and cities, and on the basic right of all to adequate shelter.[2] The day is also intended to remind the world that everyone has the power and the responsibility to shape the future of towns and cities.[3] World Habitat Day was first celebrated in 1986 in Nairobi, Kenya, and the theme chosen for that year was "Shelter is My Right".[4]
4-Oct	World Animal Welfare Day.	World Animal Day, was originated by cynologist Heinrich Zimmermann. He organized the first World Animal Day on March 24, 1925, at the Sport Palace in Berlin, Germany. Over 5,000 people attended this first event. The activity was originally scheduled for October 4, to align with the feast day of Saint Francis of Assisi, patron saint of ecology. However, the venue was not available on that day. The event was then moved to October 4 for the first time in 1929. Every year, Zimmermann worked tirelessly on the promotion of World Animal Day. Finally, in May 1931 at a congress of the International Animal Protection Congress in Florence Italy, his proposal to make October 4 World Animal Day

		universal was unanimously accepted and adopted as a resolution.
10-Oct	World Mental Health Day .	World Mental Health Day (10 October) is an international day for global mental health education, awareness and advocacy against social stigma.[1] It was first celebrated in 1992 at the initiative of the World Federation for Mental Health, a global mental health organization with members and contacts in more than 150 countries.[2] This day, each October, thousands of supporters come to celebrate this annual awareness program to bring attention to mental illness and its major effects on people's lives worldwide.[3][4] In addition, this day provides an opportunity for mental health professionals to discuss and shed light on their work, making mental health a priority worldwide.[5] In some countries this day is part of an awareness week, such as Mental Health Week in Australia.
13-Oct	UN International Day for National disaster reduction.	International Day for Disaster Risk Reduction (IDDRR) is an international day that encourages every citizen and government to take part in building more disaster-resilient communities and nations. The United Nations General Assembly designated October 13 as International Day for Natural Disaster Reduction as part of its proclamation of International Decade for Natural Disaster Reduction.[1] In 2002, by a further resolution, the General Assembly decided to maintain the annual observance as a vehicle to promote a global culture of natural disaster reduction, including prevention, mitigation, and preparedness.[2] In 2009, the UN General Assembly decided to designate October 13 as the official date for this day, and also changed the name to International Day for Disaster Reduction.[3] The word *risk* was added to the name later.
14-Oct	World Standards Day.	World Standards Day (or International Standards Day) is an international day celebrated internationally each year on 14 October.[1] The day honours the efforts of the thousands of experts who develop voluntary standards within standards development organizations such as

		the American Society of Mechanical Engineers (ASME),[2] International Electrotechnical Commission (IEC), International Ethics Standards Board for Accountants (IESBA), International Organization for Standardization (ISO), International Telecommunication Union (ITU), Institute of Electrical and Electronics Engineers (IEEE) and Internet Engineering Task Force (IETF). The aim of World Standards Day is to raise awareness among regulators, industry and consumers as to the importance of standardization to the global economy. 14 October was specifically chosen to mark the date, in 1946, when delegates from 25 countries first gathered in London and decided to create an international organization focused on facilitating standardization.[3] Even though ISO was formed one year later, it wasn't until 1970 that the first World Standards Day was celebrated. Around the globe, various activities are chosen by national standards bodies and intergovernmental organizations to commemorate the date. The Standards Council of Canada (SCC), Canada's national accreditation body, celebrates World Standards Day together with the international community by observing the day near the dates of the international observance. In 2012 SCC celebrated World Standards Day on Friday, 12 October. The World Trade Organization, for the celebration of World Standards Day, 14 October 2020, discussed the TBT Committee's Six Principles for the development of international standards[4] The United States holds an annual U.S. Celebration of World Standards Day [5][6]
16-Oct	World Food Day.	World Food Day is an international day celebrated every year worldwide on October 16 to commemorate the date of the founding of the United Nations Food and Agriculture Organization in 1945. The day is celebrated widely by many other organizations concerned with hunger and food

		security, including the World Food Programme, the World Health Organization and the International Fund for Agricultural Development. WFP received the Nobel Prize in Peace for 2020 for their efforts to combat hunger, contribute to peace in conflict areas, and for playing a leading role in stopping the use of hunger in the form of a weapon for war and conflict.[citation needed] The World Food Day theme for 2014 was Family Farming: "Feeding the world, caring for the earth"; in 2015 it was "Social Protection and Agriculture: Breaking the Cycle of Rural Poverty"; in 2016 it is Climate Change: "Climate is changing. Food and agriculture must too",[1] which echoes the theme of 2008, and of 2002 and 1989 before that. The theme of 2020 was "Grow, nourish, sustain. Together. Our actions are our future.
24-Oct UN Day,	World development information Day.	In 1972, the United Nations General Assembly decided to institute a World Development Information Day coinciding with United Nations Day on October 24. The General Assembly had the object of drawing the attention of world public opinion each year to development problems and the necessity of strengthening international co-operation to solve them.[1] The day was further recognized as the date on which the International Development Strategy for the Second Nations Development Decade was adopted in 1970. On May 17, 1972, the UN Conference on Trade and Development (UNCTAD) proposed measures for information dissemination and for the mobilization of public opinion relative to trade and development problems. These became known as resolution 3038 (XXVII), which the UN General Assembly passed on December 19, 1972. This resolution called for introducing World Development Information Day to help draw the attention of people worldwide to development problems. A further aim of the event is to explain to the general public why it is necessary to strengthen international cooperation to find ways to solve these problems. The assembly also decided that the day should coincide with

		United Nations Day to stress the central role of development in the UN's work. World Development Information Day was first held on October 24, 1973, and has been held on this date each year since then. In recent years many events have interpreted the title of the day slightly differently. These have concentrated on the role that modern information-technologies, such as the Internet and mobile telephones free from digital divide can play in alerting people and finding solutions to problems of trade and development. One of the specific aims of World Development Information Day was to inform and motivate young people and this change may help to further this aim.
30-Oct	World Thrift Day.	World Thrift Day is celebrated annually on 31st October worldwide. In India, the day is celebrated on 30th October. The day was established with the intent of raising awareness among people all around the world about the idea of saving their money in a bank rather than keeping it under their mattress or at home. This promotes savings and financial security for not only the individuals but for the nation as a whole. In this article, we will know about the day, its history and its significance. As UPSC surprises aspirants with questions linked with what usually is assumed to be trivia; it is advisable that one must scroll through the facts about World Thrift Day to get the basic information. The topic, if at all asked in the UPSC Prelims, will form the part of the current affairs. About the World Thrift Day World Thrift Day, also called World Savings Day, underscores the importance of savings in every individual's life. Savings means 'economising' or 'reserving' a part of our regular income to be able to use it to make a bright future. Saving secure ones' future and also preserves resources by avoiding wastage. World Thrift Day is an event to raise awareness about the importance of savings for individuals and as a responsible contributor to the country's development, saving money is important for the country's economic growth as well. People save money for their old age, retirement, children's education and marriage or to achieve an unfulfilled dream in their lives.

		The day gained prominence only after the Second World War when people evolved and started taking good care of their resources. Today, World Thrift Day has taken on a more significant role with commercial participation across the globe. The theme for World Thrift Day 2021 was 'Understanding the importance of savings'. This day has gained effectiveness over the years as every person today is encouraged to think about capital savings.
14-Nov	Children's Day (in India)	Children's Day is celebrated across India to raise awareness about the rights, education, and welfare of children. It is celebrated on 14 November every year on the birthday of the first prime minister of India Pandit Jawaharlal Nehru, who was known to have been fond of children. On this day, many educational and motivational programs for children are held all over India.[1] Some schools in India give leave to their students on Children's Day while private schools organize a fair for their students.
1-Dec	World Aids Day.	World AIDS Day, designated on 1 December every year since 1988,[1] is an international day dedicated to raising awareness of the AIDS pandemic caused by the spread of HIV infection and mourning those who've died of the disease. The acquired immunodeficiency syndrome (AIDS) is a life-threatening condition caused by the human immunodeficiency virus (HIV). The HIV virus attacks the immune system of the patient and reduces its resistance to other diseases.[2] Government and health officials, non-governmental organizations, and individuals around the world observe the day, often with education on AIDS prevention and control. World AIDS Day is one of the eleven official global public health campaigns marked by the World Health Organization (WHO), along with World Health Day, World Blood Donor Day, World Immunization Week, World Tuberculosis Day, World No Tobacco Day, World Malaria Day, World Hepatitis Day, World Antimicrobial Awareness Week, World Patient Safety Day and World Chagas Disease Day.[3]

		As of 2020, AIDS has killed 36.3 million (between 27.2 million and 47.8 million) people worldwide, and an estimated 37.7 million people are living with HIV,[4] making it one of the most important global public health issues in recorded history. Thanks to recent improved access to antiretroviral treatment in many regions of the world, the death rate from AIDS epidemic has decreased by 64% since its peak in 2004 (1.9 million in 2004, compared to 680 000 in 2020).
2-Dec	National Pollution Control Day	The history of National Pollution Day in India dates back to the heart-wrenching Bhopal Gas Tragedy in which thousands of people lost their lives. The incident happened on the night of 2 and 3 December 1984, and that is why the National Pollution Control Day is observed annually on 2 December.
10-Dec	Human Right Day.	Human Rights Day is celebrated annually around the world on 10 December every year. The date was chosen to honor the United Nations General Assembly's adoption and proclamation, on 10 December 1948, of the Universal Declaration of Human Rights (UDHR), the first global enunciation of human rights and one of the first major achievements of the new United Nations. The formal establishment of Human Rights Day occurred at the 317th Plenary Meeting of the General Assembly on 4 December 1950, when the General Assembly declared resolution 423(V), inviting all member states and any other interested organizations to celebrate the day as they saw fit.[1][2] The day is normally marked both by high-level political conferences and meetings and by cultural events and exhibitions dealing with human rights issues. Besides, it is traditionally on 10 December that the five-yearly United Nations Prize in the Field of Human Rights and Nobel Peace Prize are awarded. Many governmental and non-governmental organizations active in the human rights field also schedule special events to commemorate the day, as do many civil and social-cause organisations.
14- dec	Energy conservation day	National Energy Conservation Day aims to generate awareness among the masses in India about the importance of saving energy. People

		are also kept in the loop on new courses of action and plans that are being formulated. Information is given on minimizing energy waste and how the public can do their part in conserving resources. Essentially, the main objective of the day is to reduce the use of energy and to encourage people to use it efficiently. Formed under the Union Ministry of Power, the Bureau of Energy Efficiency – BEE, has been leading the celebrations of National Energy Conservation Day annually on December 14 since 1991. A constitutional body that falls under the Government of India, the Bureau of Energy Efficiency assists in the development and implementation of strategies and policies to reduce excessive consumption of energy. The committee also executed 'The Energy Conservation Act' in 2001. As part of its awareness campaign, awards are distributed annually on this day in 56 sub-sectors of the country to recognize achievements in energy efficiency. The National Energy Conservation Awards Programme commends the efforts of the industry, institutions, and establishments ranging from power plants to hotels to shopping malls. Prizes are also awarded by the BEE to winners of the National Painting Competition centered on the theme of energy conservation. India's development sectors are flourishing, which leads to an increase in the demand for energy. It is expected that India's resource requirements will double by the year 2030. The BEE strategizes and develops policies that will help decrease this demand by advocating the adoption of efficient measures for energy use.
23-Dec	Kisan Divas Farmer's Day.	The National Farmers Day in India is also known as Kisan Divas in Hindi.[7] Farmer's Day is celebrated every year on 23 December,[8] on the birthday of the 5th Prime Minister of India, Choudhary Charan Singh, also a farmer's leader, who introduced many policies to improve the lives of the Indian farmers.[9] It is celebrated by organising various programs, debates, seminars, quiz competitions, discussions, workshops, exhibitions, essays writing competitions and functions.[7]

LIST OF INSTRUMENTS:

During the process of the Audit, the following lists of instruments were used.

Sr No.	INSTRUMENT	MAKE	APPLICATION
1	Digital Power Analyser (PC Interfaced)	SCHIVAN ARNOX	Electrical Machinery.
2	Accessories -3000 Amps	ARNOX	Higher load UPTO 3000 Amps,
3	Accessories -200 Amps	ARNOX	UPTO 200 Amps,
4	Thermal Imager	FLIR	Identify loose contacts and bearing losses
5	Power Analyser (Manual)	MECO	Electrical Machinery.
6	Infrared Thermometer	METRAVI	Thermal (Fuel) Energy.
7	Digital (Contact) Temperature & Humidity Meter.	METRAVI	Electrical Machinery. (A/C's And Cooling Towers)
8	Digital Tachometer	METRAVI	Electrical Machinery.(A/C's And Cooling Towers)
9	Lux Meter	METRAVI	General & Task Lighting.
10	Sound Level Meter	METRAVI	Electrical Machinery. Generator Sound Proofing
11	Digital Anemometer	METRAVI	Electrical Machinery.(A/C's And Cooling Towers)
12	Digital KW Meter	METRAVI	Electrical Machinery.
13	Digital Power Factor Meter	METRAVI	Electrical Machinery.
14	Lap Top Computer	HP	To Interface The Instruments For More Accurate - Sophisticated Readings In Sensitive Equipment.
15	Ultrasonic flow meter		Measure liquid flow.
16	Portable Vibration Meter.	METRAVI	Effect Of Filtration - Sewing System. Structural Stability
17	Live cable detector probe	-	Detect hidden cables for safety audit.
18	Power Analyser – EMM 5	Beluk	For remote communication and detailed audit.
19	Power Analyser – ELITE PRO	Beluk	Power Analyser.
20	ETV meter, KWh & PF meters for site recording.	Secure	
21	PT's for Transformer audits.	KALPA	On field auditing of transformer loading and imbalance evaluation.

Only appropriate instruments will used wherever necessary.

ACTION PLAN SUMMARY:

Earmark the action plan.

- Invite subject experts for Tec talks,
- Organize in person panel discussions and interaction to propagate the knowledge and mitigate the problems in practicing the same.
- Prioritize the initiatives and execute.
- Observe the benefits and shortcomings.
- Workout further improvement by involving the staff and students.

MODE OF ACTION:

The process of environment protection should be carried out in three steps.

- Good housekeeping practices.
- Minor alterations using in house work culture and minimum investments on accessories as discussed.
- Capital investments, which may be required for installation of new methodologies may be taken up on phased manner.

We will be happy to assist you for any further advice/consultancy if required either on Rainwater management or on any of the measures discussed in the report.

We hope the measures are implemented in good spirit and to human convenience and comfort.

NOTES:

Notes: