Green Foundation (Regd)

CREDIBLE EARTH

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GREEN AUDIT CERTIFICATE

This is to certify that **GREEN FOUNDATION(R)**, has conducted the Green Audit with respect to Environment, Energy, Water use and their compensation of the Campus of **MS Irani Degree College, KALABURAGI**, Karnataka State, during & for the year 2022.

The Audit of the Premises, reviews of data and implementation of measures by the management was done. The implementation of Green Measures by the Management, Faculties and students, environmental sustainability is commendable and satisfactory.

This audit is conducted to ensure that a Green Policy is followed and implemented in the campus across all academic and non-academic departments and the need for individual efforts in perpetuating green living habits among the students and college related people.

GREEN FOUNDATION Karnataka INDIA GULBARGA

28/11/2022

Er Rana Kathare
BE; MIE; Ch E (Kolkata); L LB; FIV.
General Secretary,
GREEN FOUNDATION;
Energy & Environment Consultant
IT Dept. Govt. Registered & Approved Valuer
Founder Director:
Bhupavan Energy & Enviro
Projects Pvt Limited &
ARC Power Generation Limited.

28th November 2022.
Place: KALABURAGI

I agree with the data presented in this report, are true, and further express my willingness to implement the recommendations of this audit report after internal review, even if any or many of them are in excess of the relevant mandates.

Dr RV Beernally.
Principal,
Date: 28th November 2022.

Counter Signed by III Party
Principal, NV Degree College, Kalaburgi
Accredited B++
by NAAC.

MS IRANI DEGREE COLLEGE

Arts, Science & Commerce

Aiwan E Shahi, Behind Govt B.Ed. College, Rajapur Road

KALABURAGI - 585 102 Karnataka - INDIA

GPS: 17°18'56"N 76°50'16"E with Altitude 456 masl

GREEN AUDIT REPORT 2022

Green Foundation®

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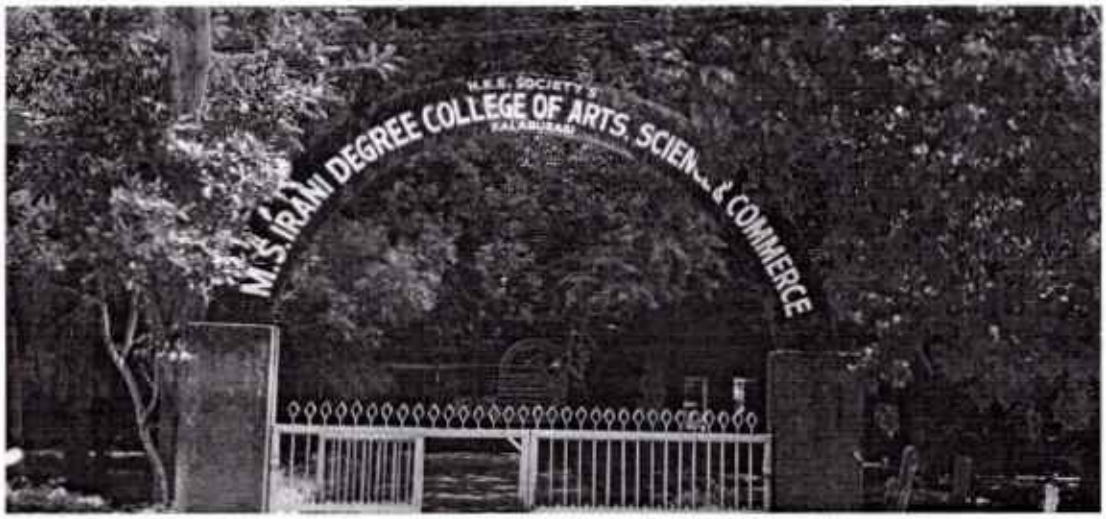

M.E.S. SOCIETY'S
M.S. IRANI DEGREE COLLEGE OF ARTS, SCIENCE & COMMERCE
KALABURAGI

In an underdeveloped country
don't drink the water
and
in a developed country don't
breathe the air

CONTENTS

MS Irani Degree College
Arts, Science & Commerce, Kalaburagi,

Vision

To Preserve and Promote the finer innate qualities of a students the future citizens of the Nation and eternal Human Values, the rich heritage of our Nation, to equip with the knowledge and skills to meet the regional and global challenges with confidence. Apart from this, intends to be a transformational leader Environmental Education & its awareness, facilitating with day to day happenings and routine practices, the full flowering of Life in Abundance

Mission

The institution's Mission is to infuse the Ethical, Moral and Social Values to disseminate the unfolding and sensitizing the integrated personality of humanity. Providing and promoting the apt education to empower and assimilate all the innate human qualities to face the National and Global Challenges with confidence, apart from the sustainable livings, ensuring a learning environment of creativity, Adventure of ideas with Constant innovation, and State-of-the-art Technique, Information & Communication Technology.

MS Irani College of Arts, Science & Commerce, KALABURAGI-585102. KARNATAKA-INDIA

Green Audit Report 2022
Executive Summary

This report presents the results of Green Auditing conducted at MS Irani College, Kalaburagi, which offers Arts, Science & Commerce graduate courses, Accredited by NAAC B Grade till 2021, established by the HKE Society, Kalaburagi, in June 1967, Muluk Sherier Irani Arts, Science & Commerce Degree College came into existence in the year 1967 by the generous donation from Late. Shri Homi Irani in memory of his Late father Shri Muluk Sherier Irani. for the regional aspirants particularly for the talented poor & needy students, is to provide the education in BA, B Com, & B Sc. This College is permanently affiliated to Gulbarga University, Kalaburagi, Karnataka, under section 2(f) and 12(b) of UGC.

Nature's Resource-Green Auditing and Energy Auditing, as well as Performance Auditing are familiar to all employees and administrators; Green Auditing is far less familiar to all stakeholders including students and general public. It is most of the time capable of evoking several doubts and misunderstandings on its need as well as on the methodology. Yet, Green Auditing is not to be understood as another name for ecological or environmental auditing. It is much broader and encompasses audit of the following aspects of an institution's normal functioning: Use of Nature's Resources as the Water, Energy, Renewable and other similar Nature's Resources etc. and the state of Health (of all related persons), Environmental Quality, Transportation & Communication as well as assessment on Accessibility for differently-able, Gender Justice and Carbon Footprint, it leaves through all activities over a year. Green denotes a world full of all living beings – human, animals, insects and plants as well as all the useful and harmful micro-organisms that can go on forever in peace, happiness and equity. Teachers play an undeniable role in

imparting knowledge to the students and the nature of future living on this planet is shaped by their hands. Hence, teachers are in a position to facilitate knowledge and promote the learners to achieve better awareness about what is happening in and around them. Teachers as professionals and influential individuals, supported by the managements of institutions, can play an important role in shaping up students' attitude through training and parading them to be the role models in their communities. Educational Institutions thus can offer an ideal service in molding the young minds in their impressionable age, towards promoting the health of nature, understanding the underlying causes of climate change and its impacts, and the conditions required to be maintained for sustaining life on earth. Green Audit is, therefore to make the entire college and the society understand through the trained students, as to how heavy is their carbon footprint, and help search for remediation and make their campuses and living surroundings 'as green as' one can make it. It is also in search of newer ways to climb up the ladder through continuous efforts in search of green shade in Appreciating their responsible behavior and admire the novel ways in which the campus team has strived to achieve their "shade of green". Green audit can also be a useful tool for a college to know how and where they are using the most energy, water and other Nature's resources. The college can thus plan for the needed changes and ensure savings. It can also be used to improvise their waste minimization strategy. Green auditing and the implementation of mitigation measures will be a win-win situation for the college, the learners and the planet.

It can also create health consciousness and promote awareness on environment, ethics and values. Green auditing in such a situation, it is only logical that the college evaluate its own contributions toward a sustainable future for all. As environmental sustainability is becoming an increasingly important issue for the nation, the role of higher educational institutions in relation to Environmental sustainability is more apparent. Over a period, the green culture will pervade the society. In this College, the Green Audit process involved the creation of a student volunteer corps in the form of Green Guardians Club and an audit team with students, teachers, members from Administration, as well as a

team of experts who have practiced greening for years including energy and environmental auditors and ecological administrators, through the Nature's and Earth Matters Green Foundation and other related team with the motto 'engineering green solutions'.

The results showed that the austere ways of the college, with the cycles of green audits conducted, have helped in identifying opportunities for a number of refuse, recover, reuse, and recycle strategies for wastes as well as for increased energy efficiency and renewable energy use. The carbon footprint in 2021 is only at a very low level, which is less with the national benchmark. A more concrete strategy for students to interact with the communities around them and help them for building resiliency could be developed in the face of onslaughts from climate change and natural calamities on our EARTH which is only one.

Er Ra Na Kathare
BE; MIE; Ch E (Kolkata) L LB.
General Secretary,
Green Foundation;
Energy & Environment Consultant
IT Dept, Govt. Registered & Approved Valuer
& Founder Director:
Bhupavan Energy & Enviro
Projects Pvt Limited &
ARC Power Generation Limited
Dated: 28.11.2022

On behalf of Green Foundation's Green Auditing Team, very much thankful to :

Dr RV Beernalli, Principal MS Irani Degree College, KALABURAGI.
Dr Rohinikumar S Hilli, HoD, Dept of Physics & IQAC Co Ordinator, MS Irani Degree College KALABURAGI.
Dr Shankappa K Head Incharge of NCC, MS Irani Degree College KALABURAGI.
Dr Pranesh S, Head Incharge of NSS, MS Irani Degree College KALABURAGI.
Sri SB Chanpally, Chief Engineer (Retd-KPCL); Bidar.
Prof. V K Damodaran, Chairman, Nature's Green Guardian Foundation, New Delhi.
The Photographer, Gardener, the respective care taker of, RO water Unit and Nature Lovers in the College. The Teaching & Non Teaching staff & the students.

Green Audit 2022: Procedures and Priorities

The National Assessment and Accreditation Council (NAAC), India, insists on having a GREEN AUDIT to be Conducted for every accredited higher educational institution (HEI) mainly because, such an act will help in achieving the following to signal the enhancement of quality of higher education as well as life in India.

- Ensure increased clarity and focus in institutional functioning towards quality Enhancement
- Ensure enhancement and coordination among various activities of the institution with careful ecological consideration and resources conservation in view and in due course institutionalize all such good practices
- Ensure internalization of the quality culture in education
- Ensure driving a strong basis for decision-making on institutional issues
- Ensure that a methodology is developed, tried and established for documentation and internal communication
- Ensure that all stakeholders including the students accept a dynamic system for quality changes in Higher Educational Institutes.

Background: For the Green Audit of 2022 of **MS Irani Degree College, KALABURAGI,** the Faculties and the Management decided upon bringing changes in the physical and cultural environments, with the participation of students, in tune with the salubrious NATURE around - minimizing its resources consumption and maximizing the performance efficiency in all sectors of activities. A preliminary random audit indicated that maximum savings could be obtained through interventions in the energy sector – cooking energy, lighting and motive power - and embracing renewable energy with an increased opportunity window. As a part of it, **Green Foundation** represented by Sri Rana Kathare, Gl. Secretary, took the charge for the **Enviro & Green Auditing** of this College Premises. This was followed by preliminary audit by a team of experts under the initiation of Sri Rana Kathare. The draft audit report and the recommendations were discussed among others, with independent references between the faculty of College and the Audit team.

For the Energy Consumption of the College, Opportunities in 2023.

Table-1

Sl No	Recommendations	Annual Financial Savings in Rs.	Investment in Rs.	Simple Pay Back period
1	Replace existing multiple single unit UPS systems with larger capacity parallel redundant/ modular UPS Systems and Batteries	75,000	4, 50,000	6 Years
2	Elimination of Phantom load	60,000	Nil	Immediate
3	Replace Fluorescent Tubes and CFLs with LED lights	75,000	1,25,000	2.0 Years
4	Install a Biogas System to replace LPG Cylinders in canteen/ Kitchen/ Laboratories	1,50,000	1,50,000	2.0 years

In order to identify opportunities to reach optimal level of electricity use, and to cut down on avoidable energy losses, students and employees and concerned persons of the College assisted the auditors in collecting accurate and up-to-date data on energy use in the campus. To have these routes to greening understood well by the students, teachers, parents and the community and the College Administration advised to establish an Energy Park with more effectively within the college premises, in which all feasible forms of renewable energy generation would be tried in a phased manner. Benefits in the energy area as well as improvements in reduction of carbon footprint could be observed, measured and documented by student volunteers in future years.

Procedures: To adopt for all the concerned persons of this College & institution.

1) Apart from the efficient use of energy leading to substantial reduction in **carbon foot print** of this institution, the other aspects will also be examined and audited.
2) In the maintenance of biodiversity and green cover in the campus, though the institution is in a better position, being blessed with bountiful flora & fauna, an accounting of the richness is intended over the coming years.
3) Planting of trees, though is a continual activity in the College campus, new targets will be set for the coming years.
4) Attempts will be made to minimize the use of polluting fuels such as coal, oil, firewood and petroleum gas.
5) The procedure for Green auditing adopted by Green Foundation Team is to collect basic data on the components of audit, compare them with similar data related to the previous years as well as with appropriate benchmarks, and showcase improvements as well as the way it has been achieved.
6) With available benchmarks for these criteria for the State/Country, easible goals will be set for the years ahead, to go up in steps to the best possible level.
7) Collection of basic data would be done by the active Staff of the nstitution, student volunteers, who will act as propagators of Environmental Philosophy.
8) Standard data sheets on component audits are populated by Green Foundation Team with Staff of the Institution, group leaders by 'walking through' every nook and corner of the campus, observing activity patterns, studying log books, bills, procedures etc., and occasionally discussing their activities in the premises, mentors, representatives of teaching and non-teaching staff.

9) Occasional lectures/demos/presentations by external experts will be arranged for the benefit of the Students & both Staff community within the campus for the future awareness.
10) In the wake of threatening climate change impacts, the benefits of building resiliency through greener ways of lifestyle – within the educational institutions, at home and in community activities and projects – are to be propagated widely within the broad community; first spreading it to fellow students, next spreading it in inter collegiate activities; and finally through co-curricular and extra-curricular activities.
11) Opportunities for students to interact with leaders in the field of arts, culture, science and technology, planning, environment etc., through involvement in public events will be provided during every educational year.
12) The message finally will be conveyed to the society and desirable changes in life styles of the community achieved - through peer and familial pressures.
13) The Final Green Audit Report will be a compilation of all the findings from a number of component audit data and their analysis and interpretation.

Priorities:

1) While all the listed components are equally important, priority for implementation will be for realizing what is immediately achievable, starting with no cost options first, low cost options next, and then moving forward with proper financial preparation, technical advice and design support, to larger initiatives that have longer 'Payback Periods'.
2) Finally, even with no reasonable payback period in sight, what is good from ecological point of view shall be done at any cost – as sustainable lifestyles are to be learned by students and required to be promoted by the community.
3) With the realization that every affront on the ecological balance of a region has always earned much multiplied recoils from the nature, learning to live differently' is of utmost urgency for the society.
4) What we mean by 'Development' needs to be re-defined. The training at the Institution is intended to have the wards imbibe the new eco culture as easily as fish learn to swim even in a rapid stream.

Post Script: The unprecedented floods, Natural Calamities in our country due to climatic imbalances occurred due Covid-19, frequent lockdowns during past years, which was in the name of developments. This happened to be the worst in over 100 years - has justified this with the Institutional View and convinced the students and staff, of the need to go at double speed towards its envisioned 'Shade of Green'.

1. Energy Audit

Year by year, the electrical energy of this college and Sustainability Audit identified immediate and no cost, low cost and high cost options that can be pursued Table-1. The College Authorities has advised to be act continuously on the first two opportunities for the coming year, which are as follows:

1) Minimise the phantom load in the electrical system. Immediate returns will come with practically no investment. Replace the existing multiple units of UPS system for computers by properly optimized single unit UPS system.
2) Replace existing ordinary tube lights and CFLs with LED lights in the Guest House and in the Hostels. Bring down the consumption without reducing illumination levels or human comfort.

Phantom load is the energy that will be measured by energy meters, even when the equipment is out of use. Computers, LCD projectors, Printers, Photostat machines, Fridges, TV units etc. which are normally hooked to the power line all the 24 hours, may be active only for part of the day. When not in use, unless they are isolated by switching off (not stopping by remote electronic controls), a small percentage of the full load will still be consumed and felt by the energy meter.

Most of them were under-loaded and idled for hours every day. Also, the batteries were old and very weak. Failure of any one UPS unit used to totally disable the devices connected to it, till it is set right. With the suggested new system, a single unit of sufficient capacity is connected in parallel mode to all the user outlets.

The following housekeeping measures required for achieving the cited gains were introduced during the Audit year:

a) Displayed stickers to switch off equipment - like Computers, Printers, Photocopiers, etc.– when not required; also to isolate them from power supply, whenever possible.
b) Maintenance schedules for switchboards and distribution boards prepared and followed.
c) Log Books for recording energy consumption, extent of power failures and running of standby generators were introduced.
d) Meters for sub-units for monitoring monthly energy consumption in every building to be Implemented in the immediate future.

The college has its electrical installations in the various buildings and facilities and the connected load exceeds 15 KW, as indicated in Table above. The electrical energy consumption takes place during normal, peak time and off-peak time differently in different sub-areas. Electricity used is charged according to the energy charges. Which is on an average of about Rs 2 to 3 k per month is made up of energy consumption during three tariff regimes – normal, peak and off-peak. Major part of it is as energy charges. Cost based on the maximum demand is not high in comparison. So, reducing consumption can bring in large reduction in **Carbon Footprint.** As three fourth of the charges are for kWh consumed, 'energy conservation' potential remains high. If demand can be restricted within the 'contract demand' limit (in kW), the demand charge component of electricity bill every month will remain predictable.

Energy Efficiency tips:

The next attractive opportunity in the path of greening through energy management is the replacement of fluorescent tubes (1200 mm or 4 ft) and compact fluorescent lamps (CFLs). At present the buildings have some number of ordinary four feet tubes. Reduction in **Carbon Footprint** will arise due to electrical energy being saved by using LED tubes that require only less electricity for giving the same level of illumination. In this case, 20 W LED tubes can be used instead of 40 W ordinary tubes. 40 W tubes with magnetic choke and starter used to need 56 W (power) to light up. So, savings per tube will be 36 W.

In addition, recommend to replace all the Bulbs with tubes of 4' for older & inefficient lighting devices (other than tubes) during the year. This also helped in bringing down the **Carbon Footprint**. On a rough estimate, the energy consumed by these all the lamps has been reduced to half and the heat radiating from such lamps has also gone down considerably, giving a greener environment.

2. Renewable Energy Use

India is on a path to rapid energy transition, started at a normal pace in 2008 as part of the then announced Climate Change Action Plan for India, with a target of installing 20,000 MW of renewable energy generation facilities including Solar and Wind electricity by 2022. Prime Minister Narendra Modi, after taking over reviewed this target and called upon the people of India to target 175,000 MW of renewable by 2022 – composed of 100,000 MW of Solar PV; 60,000 MW of Wind Power; 10,000 MW of Biomass based power and 5,000 MW of Small Hydro Power and all other renewable energy routes. At the historic 21st UNFCCC (UN Framework Convention on Climate Change) held in Paris in December 2015, India declared its INDC (Intended Nationally Determined Contribution) in which these targets are also explicitly stated. Therefore, it is only natural that through a Green Audit, any Higher Education Institution should identify opportunities for developing Renewable Energy (RE) Sources within its own premises.

At present 10 KW of Roof Top PV System is advised to install as the captive power for the premises.

From the year 2023, Greening activities for this College Authorities to be try to prepare the logistics for realizing the above renewable energy options and searched for appropriate technologies and possible subsidies for each.

3. Water Audit

MS Irani Degree College, is established at the posh area of about 17800 Sq Ft space, situated behind Govt B Ed College, Rajapur Road, Near Chandrashekhar Patil Stadium, Kalaburagi, in the heart of the City, with 372 students (331 Boys & 41 Girls) community with various faculties for the Graduation, teaching & non-teaching personnel and top management officials combined. Frequent visiting of guests lectures throughout the year in its premises. Water has never to be a problem since the College Campus was populated. The overhead tanks were systematically fed with tube well which is enriched with upper ground water table. The College has not kept separate data on water used exclusively for flushing, Utensil washing, Face washing, Floor washing etc. The College can generate data on these aspects and the efforts to conserve water from the year 2023 can be intensified.

Green Auditing of the College for the year 2022 is noted that the Campus on the whole, consumes about 4,000 Litres (10 litres/ day/ student/ staff) of water every month. College does not buy or depend upon public water supply from outside the campus. **The water tank with rain water harvesting unit is established in the campus to compensate its source in the year 2015.** The water quality, as proved by testing at regular intervals, is that there is no water problem in the campus either on quality or on quantity. The water is elevated through the electric pumps which operate nearly for 1.5 hrs a day. Of the campus electric energy consumption, 3 % can be attributed to pumping. In India the water consumption per capita/day works out to 100 LPD. This is adequate and does not show any wastage.

4. Natural Environment Bio diversity Audit:

Biodiversity Audit of this College, is spread over 217800 Sq Ft area, area of land on which 65340 Sqft is the green Canopy is maintained which is little less than the national mark (33% of the available space) of College built up area accommodated two floor beautiful building. With very pleasant climate at the entire premises is ever green with a variety of trees, bushes and grass. The fauna and flora are very rich and the buildings in the premises are constructed with minimum disturbance to this lingering greenery.

In subsequent greening efforts, the initiative of labeling the trees with their traditional names in local language is instructed to be maintain and continue with more number of trees added to enrich the biodiversity of the campus, but with several trees grown up with added standing biomass, the bigger trees will have to be measured at breast height and tree data entered in a register. The vertical gardening is advised to implement. These activities taken up by the College Authorities through NCC, NSS and Green Army Guardians.

It is informed through this report to complete the detailed listing of trees by the qualified botanists leading the effort, by the beginning of 2022. A few photographs of the campus where the greenery has been maintained and nurtured during the year are appended.

Of the varieties are there at the campus, the current year's work on examination of the suitability of plants for introduction, a preliminary list of 5 trees/plants has been prepared with Bamboo with Balcoa, Bamboos, Tulda and Manvel species are good for hot zone at this region ie North Karnataka region, have the potential to grow wildly or grow as deterrents to the growth of existing fauna and flora.

As a part of the greening through vegetation plan, it is suggested that in the College premises area, an attempt can be made to try out the Japanese technique called 'Miyawaki method of Afforestation" for developing natural forests with high biodiversity within a very short period. The plant species in this

will be mostly native plants and after 3 to 5 years, no special attention is needed to be given for the fast and lush growth of vegetation and allied other living organisms to appear.

It is to inform to plant at least 10% additional area of green with the trees and plants covered for the premises. Students and their parents may be got involved in this campaign during the coming year, and if the parents turn enthusiastic in this practice in coming years from 2023 with the ideas in their mind as well. The a forestation practice in our country so far has been to plant one or a very limited number of tree species in large number and celebrated based on the numbers involved. Enhancing bio-diversity will be given high attention in future planting habits. The photographs of the green cover for the different places of the premises are shown more elaborately.

5. Transportation and Environmental Quality.

The student from all section of Society to travel from one place to another. The students and related staff both teaching and non teaching to come to college from their respective home by the use of a transport of any either convenient way. May be, they could also be looking for greener pastures even in foreign countries when they are in search of rewarding job opportunities. This necessarily involves travelling at daily. The mode of transportation will be mostly bicycle, bike or four wheeler, bus or train. The city Kalaburagi is well connected to road and Rail Service also in its vicinity. In some other cases, it may be motor cars and very rarely airplanes. Other than bicycles, other modes require fossil fuels to propel them – like Petrol, Diesel, Gas or Aviation fuel. These fuels have heavy carbon foot prints – meaning the green house gases (GHGs) or carbon emissions in the form of CO or CO2, Sulphur compounds, Nitrogen oxides etc. tends to become heavy. This has a direct bearing on the Global Warming and consequent Climate Change, with an effect of green house gases.

The purpose of Green Auditing is to make every stakeholder understand the depth of damage each one inflicts on THE EARTH and its atmosphere, and as part of festivities and luxuries they seek to strive for remediation through simple living

and greener travel. Accurate assessment of such environmental damages is highly involved with temporal measurements and continuous monitoring. At the UN Framework Convention on Climate Change (UNFCCC-21) in December 2015, India too has committed to bring down the **Carbon Foot Print** of our country on the global environment. In short, every citizen – be it a student, teacher or parent, or anybody else not connected with it directly, should know this burden on environment and try to bring their impacts to 'near nothing' through remedial actions wherever possible.

Emission of climate changing gases through transport system – both public and private – is very high in India and India stands third in respect to GHG emitting resource utilization globally, as well at 6th place in the list of accumulated emissions after industrialization for 160 years starting from 1850. But, if we take per capita emissions, India is not a heavy polluter – it stands at 10th position and the quantum is less than one-third of the world average. The students and Staff of MS Irani Degree College, KALABURAGI, have however felt that they are also duty bound to lower the onslaught of increased **Carbon Footprints** and protect the natural environment in the College premises – which at present is certainly the better among the best.

A general survey was conducted to find out the transportation through which and so calibrated Cumulative **Carbon Footprint** of the College. The summary of the data sheets generated can be seen in the table.

Transportation Footprint

For assessing the carbon footprint due to transportation related to the functioning of the College and studies of the students, the following specific details were gathered through survey.

Table-3

Sl No.	Details	No of Vehicles	No of students/ staff	Total KMtrs daily run to & fro
1	Motor bike/Scooter (Single/Shared)	52	70	10
2	Auto Rickshaws used	3	15	5
3	Own Car (Single/Shared)	05	--	--
4	Private Van/ Mini Bus	--	--	--
5	Public Transportation/ Bus/Train	5	250	30
6	Cycling to College	10	10	5
7	Walking to College	--	10	2

Mode of Transportation for Students and Staff of College

1) The students travel to their homes once in a month normally, and at the beginning and end of every Semester. This is usually by bus (public).
2) The working staff 10 of them, generally use public transport once in a week for going to and coming back from home. Occasionally,
3) Parents and occasional visitors generally use public bus, rarely own car or very seldom hired taxi.
4) Within the campus, students do walk regularly, and since all buildings are generally close to each other, in the pleasant environment inside the campus.

The management encourages the students to use public transport for all travel to outside destinations and for returning to campus as it is safer, economic and faster. The **Carbon Footprint** for each of the items is worked with positivity.

6. Carbon Foot Print

The Carbon Footprint is the amount of carbon dioxide released into the atmosphere as a result of the activities of a particular individual, organization, or community an acceptable definition for carbon footprint is the total amount of greenhouse gases produced directly and indirectly for supporting human activities usually expressed in equivalent tons of CO2. The most common greenhouse gases (GHGs) in our environment carbon dioxide methane, nitrous oxide and ozone. Of all the greenhouse gases, carbon dioxide is the most comprising 76% globally in the atmosphere. In USA, during 2016, this percentage of CO2 in GHGs was 81%. The release of CO2 into EARTH's environment through human activities is commonly known as carbon emissions and this total impact is called **Carbon Footprint**. The name **Carbon Footprint** as a concept description originated from the discussion on 'Ecological Footprint'. While assessing in 1990, the demands of its population from the Nature's resources was increasing more rapidly.

For creating awareness the **Carbon Footprint (CF)** is in fact only a part of the ecological foot print and the damages on environment on account of our own activities the **carbon footprint** part was popularized by the different campaigns. Carbon foot prints measures only the emissions of gases that cause climate change and therefore more accurately assessed than the ecological foot prints. While there are more than a dozen popular software, as the footprint calculators freely available on the internet used by individuals; institutions to estimate and then remedy the damages.

The Carbon Footprint calculation of the College Campus, for instance, is only to know whether or not the campus activities are making excess demands on the ecology of the campus and its surroundings, and to resort to remediation through possible 'reductions on consumption', and enlargement of 'carbon sinks' such as greenery. Here, the college community can explore all means of reducing the 'consumption' that pollutes/emits high, increase the use of emission free energy forms, employ the 'reduce-reuse-recycle-refuse' that is the 4R strategy for wastes, and expand GHG absorbing/sequestering technologies and greenery – to achieve a bit more than what is required as per the calculation. That will help the campus flourish as a 'Greener Campus'. Having noted that tedious procedures involving continuous monitoring throughout the year to obtain a precise measure of potential damages to the environment is not warranted, the audit can employ empirical measures that will quantify the ecological footprint to reasonable accuracy and suggest simple remediation measures that will help neutralize the impacts completely and take the positives even a shade higher than that is

required. As the major contributors of damaging impacts are the increased population, their nature of consumption, and transportation requiring fossil fuels, the approach taken for this Green Audit will be to use empirical constants on the quantities arrived at for the major contributors. Also, remediation will be based on expanding the potential positives present in the campus. Creating awareness to the entire campus community on these and getting them to volunteer to contribute will be an effortless change in lifestyle, on which the institution as a whole can feel proud.

Data resulted from different component Audits from 1 to 5

It was stated therein that the carbon footprints of each category of activity will be covered in Chapter 6. These component audit findings are capable of giving the following data:

1) The area covering the higher education institution/college
2) The total number of persons (students, teachers, other members of staff, visitors including parents and guests) involved in normal functioning of the institution
3) The number of persons resident in the campus
4) The type and number of vehicles normally used for transportation
5) The forms and quantity of energy used in the campus and their origin
6) The amount of water, food materials, stationeries etc. consumed and energy used for providing them
7) The amount of wastes including food waste
8) Amenities provided in the campus and their contribution to emissions.

On the even side:

1) The biodiversity in the campus and their potential to remediate GHG Emissions.
2) The carbon positive (renewable) energy generation within the campus
3) The amount of recycling/reuse of resources
4) The type of waste management resorted to
5) Water harvesting, water management and waste reduction approaches

Assumptions:

The following assumptions based on well researched and globally accepted empirical procedures are used for assessing the carbon footprint as well as for determining the remediation measures:

1) The coefficients taken are as per IPCC, International Energy Agency, India's BEE or FAI [in case of food related ones] as well as from India specific studies by Research Institutions
2) The Average Carbon Foot Print concerned to the College/institution is 0.3 to 0. 6 Kg/person.
3) The carbon emitted by a car while consuming 1 litre of petrol as 2.3 kg CO2and if 1 litre of diesel as 2.68 kg CO2
4) Average kilometer covered by a car per liter of petrol as 20 km
5) The km run by a bus in high ranges taken as 4 km/L of diesel (In plains 5 km)
6) For per capita carbon footprint calculation, a bus is assumed to have 50 passengers
7) An auto rickshaw running in the region is assumed to get 16 km/litre of petrol
8) Two wheelers are expected to get 50 km/litre of Petrol Carbon absorption capacity of one full-grown tree as 6.8 kg CO_2
9) Carbon absorption capacity of semi-grown trees as 50% of that of full grown
10) Carbon absorption of bush plants varies widely according to the species
11) Certain bushes absorb as high as 49,000 g CO2 per plant, whereas some others absorb as low as 150 g CO2 per plant. As a general guide, the per-plant carbon absorption is assumed as 200 g CO_2
12) The carbon absorption capacity of a 10-sq.ft. area of lawn is 1 g CO_2 per day
13) A person uses about 550 liter of pure oxygen each day (according to Arbor Day Foundation
14) Paper is assumed to be of density 80 gsm (average)
15) Firewood is assumed to have not more than 10-20% moisture before burning
16) Events & Festivals contributed CF in the campus based on no. of events, pax participating and extent of festivities with high emission levels.

Assessment of Carbon Footprint:

The following activity related carbon footprints are to be assessed based on data available from component audits in the previous chapters.

1. Carbon Footprint due to energy use
   a) Electricity use including for water pumping, water purification and waste water treatment
   b) Use of Fossil fuels like Diesel, Petrol, LPG etc.
   c) Use of Firewood

2. Carbon Footprint due to production of Wastes
   a) Food Waste
   b) Paper use & waste
   c) Waste water
   d) Other wastes (e-wastes, hazardous wastes etc., if any)
3. Carbon Footprint due to Transportation needs
   a) Day scholars commuting between home and college
   b) Staff & Students – weekly travel to and fro home
   c) Use of Cars & Taxis by Staff, Parents, Management and others
   d) Auto Rickshaws (3-wheelers) hired
   e) 2 wheelers–students & Staff
4. Carbon Foot print due to Events and Festivals within the campus

Remediation Available or Created

1. Due to increased use of renewable energy (RE)
   a) Solar PV electricity
   b) Solar Hot Water
   c) Wind energy
   d) Biogas
   e) Micro Hydro Power & Other
2. Due to energy efficiency improvement
   a) Replacement of old tube lights
   b) Replacement of incandescent bulbs to CFLs & LED
   c) Replacement of Fans/Motors etc
   d) Up grading of UPS network
   e) Phantom load reduction
   f) Other means
3. Due to waste reduction, recycling and waste to energy projects
   a) Waste Reduction
   b) Recycling
   c) Waste to Energy
4. Due to innovations in transportation
   a) Sharing of Vehicles.
   b) Adopting Means of low CF travel options
   c) Others like introduction of electric vehicles/Solar auto rickshaws, boats etc.
5. Due to biologic means
   a) Conservation of existing greenery
   b) Tree plantation & Biodiversity conservation (new)
   c) Gardening, including lawns and hedges

6. Due to 'Outreach' for Promotion of Green Living

The Carbon Foot Print calculated by the above consideration has to be brought into a Balance Sheet, where the Remediation available is shown as compensation provided.

The difference between these will indicate the amount of remediation to be planned and implemented in the coming years.

Calculation of Carbon Footprint source-wise

Having assessed the maximum carbon footprint in terms of Tons of CO_2 equivalent, the next step is to assess the remediation available and see how far it will compensate for the damages to the environment.

Carbon Footprint Analysis and Evaluation:

The per capita Carbon Footprint for **MS Irani Degree College, KALABURAGI.** Here for the persons related to the college is 416 [372+26+18] is 132.96 Kg of CO_2 equivalent [132.96 Kg /416- persons]. According to Economic Survey, Govt. of India 2009-10, the per capita emission for an Indian was 1.2 ton CO_2 eq. per annum. In the same report, it was projected that this will go up to 2.0 – 2.5 T of CO_2 by 2025 and to 3.0 – 3.5 T of CO_2 by 2030. For the year 2021, for this college, the **Carbon Footprint** per capita at 0.132 T CO_2. is about equivalent to well below of the national average. **The campus is thus a Green Campus.**

GREEN AUDIT CERTIFICATE

This is to certify that **GREEN FOUNDATION(R),** has conducted the Green Audit with respect to Environment, Energy, Water use and their compensation of the Campus of **MS Irani Degree College, KALABURAGI**, Karnataka State, during & for the year 2022.

The Audit of the Premises, reviews of data and implementation of measures by the management was done. The implementation of Green Measures by the Management, Faculties and students, environmental sustainability is commendable and satisfactory.

This audit is conducted to ensure that a Green Policy is followed and implemented in the campus across all academic and non-academic departments and the need for individual efforts in perpetuating green living habits among the students and college related people.

Date : 28th November 2022
Place : Kalaburagi

Er Rana Kathare
BE; MIE; Ch E (Kolkata); L LB; FIV.
General Secretary,
GREEN FOUNDATION;
Energy & Environment Consultant
IT Dept, Govt. Registered & Approved Valuer
Founder Director:
Bhupavan Energy & Enviro
Projects Pvt Limited &
ARC Power Generation Limited.

I agree with the data presented in this report, are true, and further express my willingness to implement the recommendations of this audit report after internal review, even if any or many of them are in excess of the relevant mandates.

Dr. RV Beernally.
Principal,
Date: 28th November 2022.

At a glance the Nature's Resources and its consumption:

Table-4

Sl No	Particulars	World's Average	National Average	At MS Irani College
1	Water	135 LPD	92 LPD	50.00 LPD
2	Energy	2674 KW Per Capita	1181 KW Per Capita	0.40KW per Capita
3	World's Best Air Quality Index AQI	Honululu-Hawaii 22	Satana- Madhya Pradesh 65	46
4	Green Cover	30.71%	24.56%	30.00%
5	Carbon Foot Print	4.97 T of CO2/Capita	2 .00 To 2.50 T of CO2/Capita	0.131 T of CO2/Capita

Green Audit Compliance Statement

Table-5

Overall Objective	Main Objectives	Compliance Status
Ensure that a Green Policy is formulated, enforced and reviewed.	1. Ensure that there is a competent Green Officer from an external agency, who will provide guidance on Environmental Impact studies	Included
	2. Ensure that the Green Policy/ Protocol is reviewed annually, progress monitored and achievable and measurable targets set for the future course	Ensured
	3. Ensure that the Green Policy is enforced, regardless of whether it exceed mandates of the law	Enforced
	4. Ensure that every member of staff and student community commits to the greening of the institution	Commitment ensured
	5. Ensure that Green Audit is conducted annually, action taken on the basis of its reports and recommendations given under them	Green Audits conducted and actions taken on its recommendations

Counter Signed by IIE Party
Principal, NV Degree College, Kalaburagi
Accredited
Bet by NAAC

Er Rana Kathare
BE; MIE; Ch E (Kolkata) L LB.
For: **Green Foundation;**
Energy & Environment Consultant

ಪ್ರಾಚಾರ್ಯರು
ಸರಕಾರಿ ವಿದ್ಯಾಲಯ ಕಲಬುರಗಿ,
ಶ್ರೀ ಕಸ್ತೂರಬಾ ಮಹಿಳಾ ವಿಜ್ಞಾನ ಕಾಲೇಜು
ಜಿ. ಕಲಬುರಗಿ - 585 103

Acknowledgements:-

I on behalf of Green Foundation are thankful to the ***Dr RV Beernally,*** *The Principal of MS Irani Degree College, Kalaburagi, and the staff of the college, especially* ***Sri Dr Rohinikumar Hilli,*** *IQAC Co-coordinator & Head of the Physics Dept.,* ***Dr Prakash S*** *&* ***Dr Shankrappa K,*** *& the librarian, And* ***Sri Chanpally Shivaraj*** *Chief Engineer, (Retd), Bidar.* ***Smt: Sonali VM,*** *Lecturer in Dept of Mechanical Engineering Panchashil College, RajRajeshwari Nagar, Bengaluru.* ***Prof. V K Damodaran,*** *Chairman, Nature's Green Guardian Foundation, New Delhi. The Editor and DTP operators, for entrusting processes of this Green Auditing. We thank all the participants of the auditing team, faculty and non-teaching staff who provided the information along with us during the inspection & survey. We also thankful to the office staff who helped us for the completion of this Green Audit Report.*

Next Audit

In order to promote continuous improvement it is recommended to conduct the next Green Auditing during the year 2023.

PHOTO GALLERY

Inner Garden Area

RO Water Plant

Outer Garden Area

Rain Water Establishment

ಪ್ರಾದೇಶಿಕ ಕಛೇರಿ, ಕರ್ನಾಟಕ ರಾಜ್ಯ ಮಾಲಿನ್ಯ ನಿಯಂತ್ರಣ ಮಂಡಳಿ
REGIONAL OFFICE, KARNATAKA STATE POLLUTION CONTROL BOARD
ಪ್ಲಾಟ ನಂ. 12/2, ಸರ್ವೆ ನಂ. 19/ಪಿ, ಮನ್ಸಫ್ದಾರ್ ಲೇಔಟ್, ಎಂ.ಜಿ. ರಸ್ತೆ, ಸಂತ್ರಾಸವಾಡಿ, ಕಲಬುರಗಿ-585 101
Plot No. 12/2, Sy.No.19/P, Mansafdar Layout, M.G. Road, Santraswadi, Kalaburagi-585 101
E-mail: gulbarga@kspcb.gov.in Web site: http://kspcb.karnataka.gov.in Phone: 08472-256246

Date: 20.12.2022

Vehicle emission monitoring carried out at **M S Irani Degree College of Arts, Science & Commerce, Kalaburagi** on 16.12.2022 through Parisara Vahini of KSPCB and the vehicle emission monitored data are as follows:

Sl No	Name of Vehicle	Type of Vehicles	Model	Registration No.	Petro vehicles		
					CO%	HC	Pass/Fail
1	Access 125	2 Wheeler	2019	KA32EW6044	0.99	744	Pass
2	Hero Splender	2 Wheeler	2018	KA33K3917	0.24	322	Pass
3	Honda Deo	2 Wheeler	2022	KA32HC4491	0.14	56	Pass
4	TVS Platinum	2 Wheeler	2021	KA32EZ9616	0.32	642	Pass
5	Hero Splender	2 Wheeler	2018	KA32EV6767	2.22	390	Pass
6	TVS Jupiter	2 Wheeler	2022	KA32HC4499	1.98	151	Pass
7	TVS Scooty Pep	2 Wheeler	2016	KA32Y5953	2.16	1512	Pass
8	Mahindra	2 Wheeler	2016	KA32EN9677	1.93	276	Pass
9	TVS Jupiter	2 Wheeler	2018	KA32EV1120	0.59	511	Pass
10	TVS Jupiter	2 Wheeler	2017	KA32EM9932	1.7	1113	Pass
11	TVS Scooty Pep	2 Wheeler	2016	KA32W8819	0.1	502	Pass
12	Honda Avtiva	2 Wheeler	2019	KA32EW2363	0.1	1372	Pass
13	Hero Honda	2 Wheeler	2008	KA32U9707	0.08	698	Pass
14	Honda Activa	2 Wheeler	2017	KA32EN3159	2.01	437	Pass
15	Honda Activa	2 Wheeler	2022	KA32HC1179	0.09	165	Pass
16	Hero Passion Pro	2 Wheeler	2014	KA32EE1703	1.93	2930	Pass
17	TVS Jupiter	2 Wheeler	2021	KA32ES6813	2.75	462	Pass
18	Honda Deo	2 Wheeler	2017	KA32EM6578	0.04	943	Pass
19	Honda Activa	2 Wheeler	2018	KA32ES8256	0.25	208	Pass
20	Honda Activa	2 Wheeler	2018	KA32FB2660	1.98	394	Pass

Counter Signed by III party
Principal, NV Degree College Kalaburagi
Accredited B++ by NAAC.

Manjappa
Environmental Officer
Karnataka State Pollution Control Board
KALABURAGI

ಪ್ರಾದೇಶಿಕ ಕಛೇರಿ, ಕರ್ನಾಟಕ ರಾಜ್ಯ ಮಾಲಿನ್ಯ ನಿಯಂತ್ರಣ ಮಂಡಳಿ
REGIONAL OFFICE, KARNATAKA STATE POLLUTION CONTROL BOARD
ಪ್ಲಾಟ್ ನಂ. 12/2, ಸರ್ವೆ ನಂ. 19/ಪ, ಮನ್ಸಫ್‌ದಾರ್ ಲೇಔಟ್, ಎಂ.ಜಿ. ರಸ್ತೆ, ಸಂತ್ರಾಸವಾಡಿ, ಕಲಬುರಗಿ-585 101
Plot No. 12/2, Sy.No. 19/P, Mansafdar Layout, M.G. Road, Santraswadi, KALABURAGI-585 101
E-mail: gulbarga@kspcb.gov.in Website: http://kspcb.kar.nic.in Phone: 08472-256244

REGIONAL LABORATORY Date: 20/12/2022

ANALYSIS REPORT

Name of the Industry/Location	M.S.I Degree college of Arts, Science and commerce, Rajapur Road, Kalaburagi.
Sample Collected by	R.O Kalaburagi.
Date of collection	16/12/2022 & 17/12/2022
Date of Receipt	17/12/2022
Sample No	2863
Particulars of the samples	Ambient air sample at the college Premises.
Period of sampling	24 hrs

RESULTS

Sl No.	Parameters Analyzed	Units	Standard	Result	Test Method
1	Sulphur Dioxide (SO_2)	$\mu g/m^3$	80	7.5	IS 5182 (Part2)-2001
2	Nitrogen Dioxide (NO$_2$)	$\mu g/m^3$	80	6.7	IS 5182 (Part-6)-2006
3	Respirable Suspended Particulate Matter (PM_{10})	$\mu g/m^3$	100	84	IS 5182 (Part-23)-2006 (Reaffirmed 2012)

INFERENCE	Conforms to the Standards prescribed.

Analysed by:

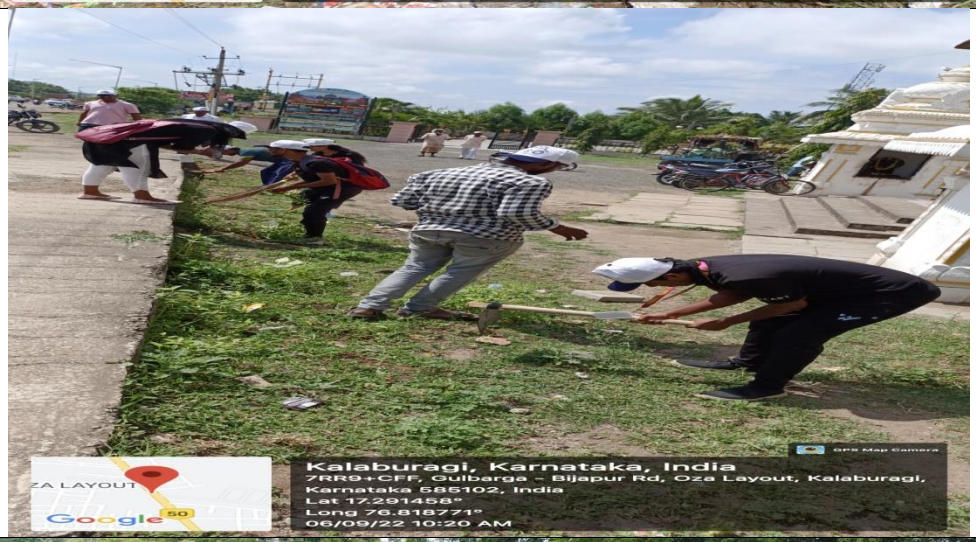
Authorised Signatory

Counter Signed by II Party
Principal, NV Degree College, Kalaburagi.
Accredited B++ by NAAC.

ಪ್ರಾಚಾರ್ಯರು
ಮೊಹಮ್ಮದ ವಿದ್ಯಾಲಯಿ ಶರಣ,
ಶ್ರೀ ಶಕ್ತಿಯಾಲಾ ಮೂಲ ವಿಜ್ಞಾನ ಕಾಲೇಜ
ರಾ. ಸಾಂಖ್ಯಿಕರಾವ ಪ್ಲಾ ವಾಣಿಜ್ಯ ಮಹಾವಿದ್ಯಾಲಯ
ಕಲಬುರಗಿ - 585 103

GREEN INITIATIVES OUT SIDE THE CAMPUS

PRINCIPAL
PRINCIPAL
M.S.I. DEGREE COLLEGE
GULBARGA.



GREEN INITIATIVES OUT SIDE THE CAMPUS

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PRINCIPAL
M.S.I. DEGREE COLLEGE
GULBARGA.

HKE SOCIETY'S

M.S. IRANI DEGREE COLLEGE OF ARTS, SCIENCE AND COMMERCE, KALABURAGI.

CAMPUS ENVIRONMENTAL PROMOTION ACTIVITIES IN COLLABORATION WITH

KARNATAKA POLLUTION CONTROL BOARD, KALABURAGI.

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GULBARGA.