RAJASTHAN ENERGY & CONSULTANCY SERVICES (RECON, UDAIPUR)

CERTIFICATE

This is to certify that Green Audit at Sangam University – NH-79, Bhilwara Chittor By-Pass, Bhilwara, Rajasthan 311001 was conducted on 30th July 2021.

University has submitted necessary data and credentials for scrutiny. It is found that Sangam University is an oxygen tank with negligible pollution as well as carbon emission. The University also has 100 percent rain water harvesting and is helping in maintaining eco friendly environment within and around campus with the help of underground water table.

Audit Officer	Date	Certificate No.
CEA Kirtesh Bagarecha	25th August 2021	RECON/GA/2021/011

July 2021

GREEN AUDIT REPORT

Prepared for:

SANGAM UNIVERSITY™

where Aspiration meets Opportunity

SANGAM UNIVERSITY

NH-79, Bhilwara Chittor By-Pass,

Bhilwara, Rajasthan, India

Submitted By:

RECON

RAJASTHAN ENERGY & CONSULTANCY SERVICES

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DISCLAIMER:

M/s Rajasthan Energy & Consultancy Services (RECON), Udaipur, has prepared this Green Audit Report document in August 2021 for Sangam University, Bhilwara, on the best judgment basis.

While all reasonable care has been taken in its preparation, details contained in this report have been compiled in good faith based on information provided by Sangam University, Bhilwara.

It is further informed that the projections are the management's best estimates and no representation, warranty, or undertaking, express or implied is made and no responsibility is accepted by M/s Rajasthan Energy & Consultancy Services (RECON), Udaipur and/or its affiliates and/or its Directors, employees, officers in this report or for any direct or consequential loss arising from any use of the information, statements or forecasts in the report.

Kirtesh Bagarecha
Certified Energy Auditor
EA-16384, BEE, GOI

1. ACKNOWLEDGEMENT

The Energy Audit for the Sangam University, Bhilwara has been carried out by M/s Rajasthan Energy & Consultancy Services, Udaipur (RECON).

The team RECON is thankful to Sangam University, Bhilwara management for their professionalism and co-operation provided during the audit process.

We also thank all officials for supporting us during field study & report preparation.

2. EXECUTIVE SUMMARY

Green Audit was carried at Sangam University, Bhilwara by M/s Rajasthan Energy & Consultancy Services during July 2021.

The Management is highly conscious about Go Green Initiative and they have initiated several measures to reduce carbon emission & energy consumption. University has developed a culture of conservation to support Green initiatives and believe in a teamwork approach that includes students, teachers, parents, custodian and administrators. University can have such a profound impact on communities – both by saving precious resources today, and by teaching students how to be environmental stewards for a lifetime.

We appreciate the support and co-operation of staff during the study and their positive attitude towards Green Initiative. Conservation is a continuous process and there is always scope for further improvements, so one should keep going with new environment friendly activities.

3. INTRODUCTION

3.1 About the University

The National Society for Education Research and Development (NSERD) was registered in the year 1999 in Jaipur with the major objective of providing quality education and research environment in Rajasthan.

The word **SANGAM** means a Confluence of rivers, denoting an act of coming together or all merging into one. To uphold this unity, Sangam University has been established by Badrilal Soni Charitable trust and promoted by Sangam Group of Industries with the mission to make world class higher education affordable and accessible to all sections of society. The vision of our University is to become a center of excellence for holistic development and global education by cultivating and nurturing young minds to transform into global leaders of the future. The University tries to provide a professional environment along with imbibing a sense of moral and human values. We are committed to bringing forth an educational milieu that is tuned to the needs of global markets.

Founded in the year 2012, with state-of-the-art infrastructure and facilities, Sangam is built with the objective to become one of the best universities of Rajasthan. We meet the demands of this dynamic corporate and professional society.

degree programmes and foundation years have always been distinctively challenging and flexible to foster a broader outlook. Our interdisciplinary approach doesn't just reinforce a wonderful education but empowers budding professionals of tomorrow.

Sangam is a student-centered university that empowers each individual to succeed. We offer an accessible, nurturing and student-focused educational experience to those who want to move ahead steadily towards personal or professional growth. Our diverse faculty maintains good association with students, mentoring them throughout their entire educational journey. SU is a comprehensive University of learning - dedicated to the internal and professional growth of our students.

Campus Information

The University is offering courses in the following fields:

- School of Engineering and Technology
- School of Management Studies

- School of Basic Applied Science
- School of Legal Studies
- School of AGRICULTURE SCIENCE AND TECHNOLOGY
- School of NURSING
- School of ARTS AND HUMANITIES
- School of PHARMACY

3.2 Objectives

In recent times, the Green Audit of an institution has been becoming paramount important for self-assessment of the institution which reflects the role of the institution in mitigating the present environmental problems. The college has been putting efforts to keep our environment clean since its inception. Therefore, the purpose of the present green audit is to identify, quantify, describe and prioritize the framework of Environment Sustainability in compliance with the applicable regulations, policies and standards

3.3 Scope of Work

For Green Audit following 13 major areas (including their subsections) are covered and compliance/initiatives under these areas were verified/validated.

A. Good Daylight Design and Ventilation
B. Water Efficiency
C. Wastewater Management
D. Indoor Air Quality
E. Energy Efficiency
F. On-site Energy Generation
G. Temperature and Acoustic Control
H. Paper Waste Management
I. E-Waste Management
J. Canteen and Solid Waste Management
K. Universal Access and Efficient Operation and Maintenance of Building
L. Green Belt
M. Green Programs (Green initiatives)

3.4 Methodology

The methodology adopted for achieving the desired objectives is the following:

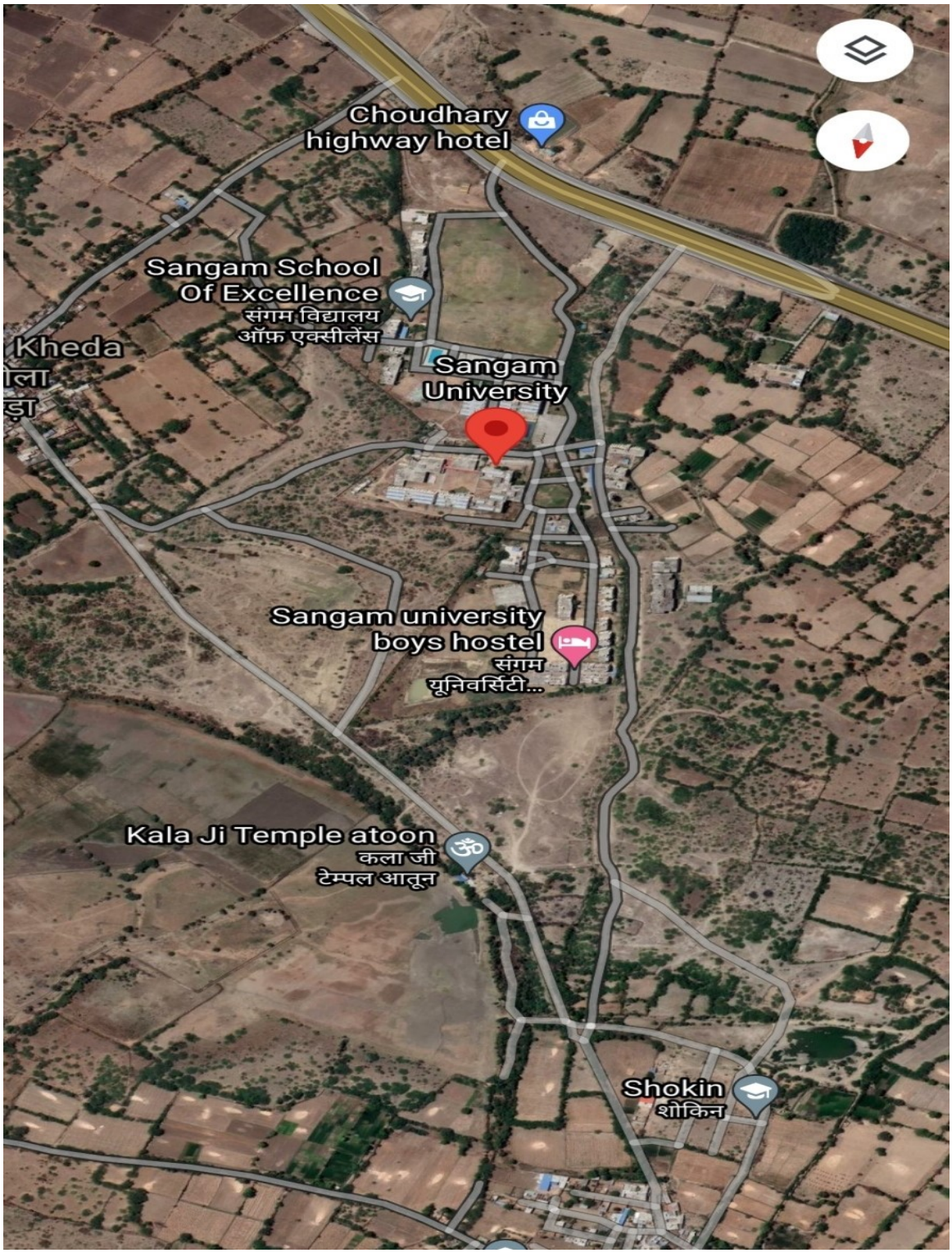
- Discussions with the concerned officials of the unit for identification of major areas of focus and other related systems.
- A team of professionals visited the Sangam University and had discussions with the concerned officials/supervisors to collect data/information related to Green Audit and Taken site Survey in Fill a Green Audit Questioners
- The data was analyzed and Develop Green Audit Report
- Green Audit Questioners Attached in Annexure-1.

4. ENVIRONMENTAL SETTING

Sangam University has been developed around 15 KM from Bhilwara city. The land use around the campus is mainly educational institute and Agricultural. Only Sangam School of Excellence is adjoining to the University otherwise total area is green (Agriculture land).

Figure 1: Sangam University Location On Map (1)

Figure 2: Sangam University Location On Map (2)



5. GREEN AUDIT

5.1 Green Audit Introduction

Green Audit is a process of systematic identification, quantification, recording, reporting and analysis of components of environmental diversity of any establishment. It aims to analyze environmental practices within and outside of the concerned sites, which will have an impact on the surrounding ambiance as well as the eco-system.

The green audit can be a useful tool for all institutions to determine how and where are they using the most energy, water and other natural resources. The college then considers how to implement changes and make savings by implementing the outcomes of Green Audit. It can also be used to determine the type and volume of waste, which can be further used for a recycling project or waste management policy or to improve the waste minimization plan. It can create health consciousness among young people and promote environmental awareness, values and ethics as a long-term perspective in their life. It provides staff and students a better understanding of Green's impact on campus.

Self-inquiry is natural and necessary for the growth of quality education. It could also be stated that institutional Self-inquiry is natural and necessary for the growth of a quality educational institution. Thus the University must evaluate its contribution towards a sustainable future. As environmental sustainability is becoming a highly important issue for the nation, the role of higher education institutions in environmental sustainability is more prevalent.

The rapid urbanization and economic development at the local, regional and global levels have to lead to several environmental and ecological crises. On this background, it becomes essential to adopt the system of the Green Campus for the institutes which will lead to sustainable development. At the same time reduce a sizable amount of atmospheric carbon-di-oxide (CO_2), Lead, Nitrogen Oxides, Ozone, Particulate Matter, Sulfur Dioxide and Other Air Pollutants from the environment.

The National Assessment and Accreditation Council, New Delhi (NAAC) has made it mandatory that all Higher Educational Institutions should submit an annual Green Audit Report. Moreover, it is a part of Corporate Social Responsibility of the Higher Educational Institutions to ensure that they contribute towards the reduction of global warming through Carbon Footprint reduction measures.

5.2 Details of the infrastructure

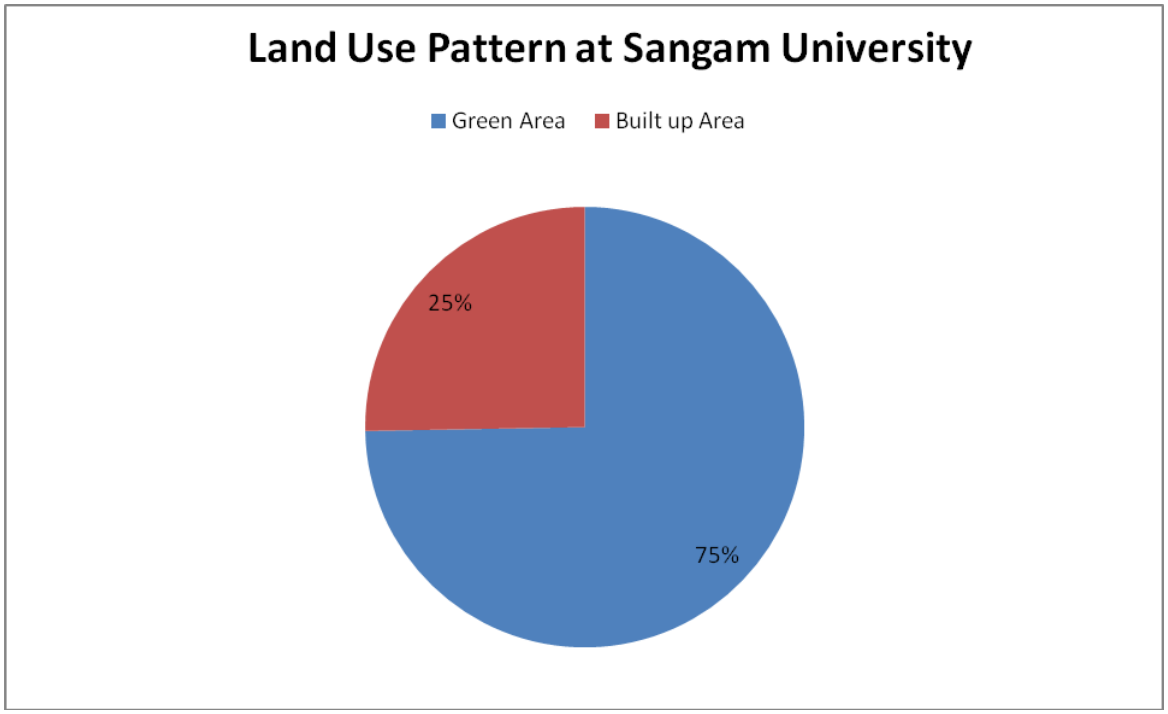
Sangam University has Total Land: 39.40 acres (159446 Sq. Mtr) of land comprising in Khasra Nos 2312M, 2308, 2535/2107, 2360/2314, 2640/2313, 2313 of Village Atun Tehsil Bhilwara and 1177/947, 1178/947, 1179/947, 947/2 of Village Gathilakheda Tehsil Bhilwara.

Table 1: Details of Constructed area of Sangam Univesity

Building Name	Area (Sq.Mtr.)	Floor
Administrative Block	5712.86	Grond, First and Second
Academic Block (MBA Block, PG Block, LT Block, Library Block)	17272.65	Grond, First and Second
Residential Block (Staff Qtr. and Guest House)	4819.98	Grond, First and Second
Student Residence (Boys hostel, Girls Hostel)	12498.44	Grond, First and Second
Total Area	**40303.93**	

The total area of Sangam University is 159446 Sq. Mtr out of which the built-up area is 25% (i.e 40304 m^2) and Green area is 75% (i.e. 119142 m^2).

Figure 3: Land Use Pattern at Sangam University



5.3 Good Daylight Design and Ventilation

- Corridors are wide with good ceiling height. All the corridors receive good daylight.
- Classrooms, Labs and Library have large windows. Windows are kept open to adequate daylight.
- Classroom walls, corridors and labs are white-washed, this enhances the daylight received.
- Curtains are provided on some of the windows to avoid glare.
- Laboratories are provided with exhaust fans to disperse heat, fumes and odors.
- Staircases receive daylight through windows provided at various levels.

Figure 4: Good daylight and Ventilation in classrooms Main staircase which receives daylight

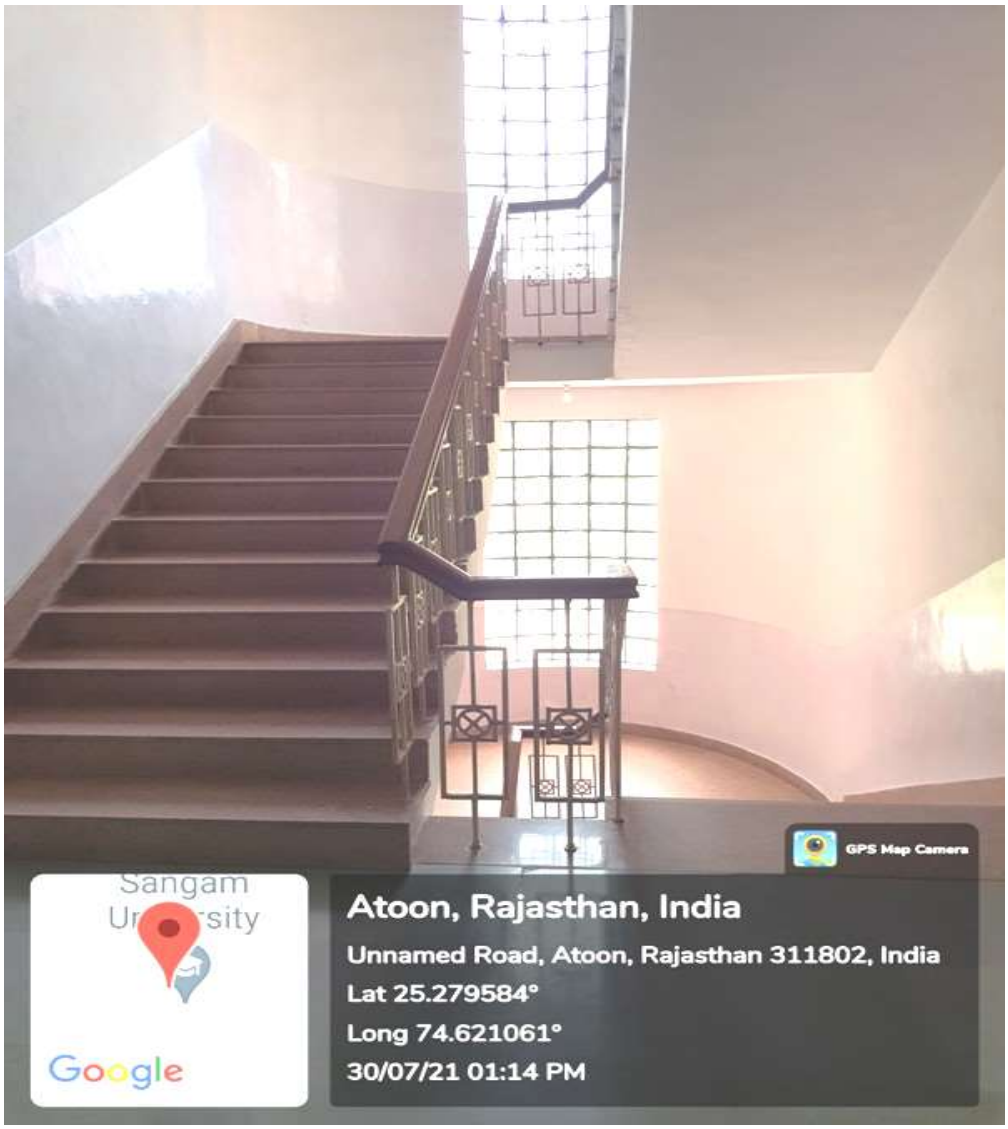


Figure 5: Daylight in Labs

5.4 Water Efficiency

- 4 nos Submersible pump is used for water supply in the campus
- Centralized Industrial RO & Softener Plant is installed for Drinking Water to get better efficiency of RO then small ROs at every water cooler.
- University has separate Tanks for Drinking water and Utility Water in All blocks which is unique in sangam university, By this university is able reduce drinking water wastage.
- For drinking water supply water cooler are installed at various location in the campus.
- Currently water meter is not installed to monitor the quantity of water extracted.
- It is recommended water meter to be installed and daily/monthly water consumption to be recorded.
- Normally mops are used for floor cleaning and the hose is used for cleaning once a week.
- Water conservation faucets in washrooms were not seen. Installation of such faucets can save water and will help in minimizing the water footprint of the institute.

- Dual flushing system is not provided in the washrooms.
- Signage is provided in washrooms emphasizing water conservation.
- Rain water harvesting system is installed in all the blocks.

Figure 6: Signage for Water Conservation

5.5 Wastewater Management:

- Sanitary wastewater generated from washrooms is discharged into septic Tank.
- Wastewater/ sewage recycle is not practiced in the College as grey water.
- Sewage treatment/recycle facility is not provided
- Sewage Treatment plant should be provided and all water to be recycle.

5.6 Indoor Air Quality:

Indoor Air Quality (IAQ) refers to the air quality within and around buildings and structures, as it relates to the health and comfort of building occupants. Some common indoor pollutant is listed as below:

- Molds and other allergens - This may arise from water seeping into the Building envelope or skin, plumbing leaks, condensation due to improper Ventilation, or from ground moisture penetrating a building part.

- Carbon monoxide Sources of carbon monoxide are incomplete Combustion of fossil fuels.
- Volatile organic compounds (VOCs) - VOCs are emitted by paints and Lacquers, paint strippers, pesticides, office equipment such as copiers and Printers, correction fluids and carbonless copy paper, graphics and craft Materials including glues and adhesives, permanent markers, and Photographic solutions etc.
- Carbon dioxide - Due to human respiration.
- Particulate matter - Due to construction and maintenance activities.

Sangam University has Provided indoor Air Quality Report from NABL Approved Lab, report has been attached in Annexure-3, Indoor Air Quality parameters are Tabulated below:

Table 2: Indoor AIR Quality Monitoring And Analysis Result

S.N	Parameter	Unit	Result	Specification/Limit (As Per CPCB)
1	Particulate matters (Size Less Than 10µm) (PM_{10})	µg/m³	68.9	For 24 Hrs=100
2	Particulate matters (Size Less Than 2.5µm) ($PM_{2.5}$)	µg/m³	28.7	For 24 Hrs 80
3	Sulphur Dioxide (SO_2)	µg/m³	12.6	For 24 Hrs 80
4	Nitrogen Dioxide (NO_2)	µg/m³	17.3	For 24 Hrs 80
5	Carbon Monoxide (CO)	mg/m³	0.06	For DB hrs=0.2,For 01 Hrs=04
6	Lead (Pb)	µg/m³	Absent	For 24 hrs =1.0
7	Ozone (O_3)	µg/m³	28	For 8hrs=100 For 1 hr=180
8	Ammonia (NH_3)	µg/m³	Absent	For 24hrs=400
9	Benzo(a) Pyrene(BaP)	ng/m²	Absent	For Annual=01
10	Nickel (Nil)	ng/m²	Absent	For Annual=20
11	Benzene (C_5H_5)	µg/m³	Absent	For Annual=05
12	Arsenic	ng/m²	Absent	For Annual=06

From the above table data, we found that the indoor air quality of Sangam University is good. Some other observations under indoor air quality are as below:

- In classrooms, the mode of ventilation is natural (through windows) and is Enhanced by fans. Air conditioners are used in some of rooms/labs eg. computer labs, computer server rooms.
- Heating Ventilation and Air Conditioning (HVAC) system do not exist.
  Split and Windows Air conditioner are used.
- Exhaust fans are provided only in labs and washroom.

- indoors plants are seen in the College. indoor plants can be plotted not only for the aesthetic appearance but also for health benefits. Refer to Annexure 1 for details.
- Green Area has been set up in the campus area.
- IAQ awareness signage has been provided on walls in College for increasing awareness about indoor air pollution.

Figure 7: IAQ Awareness Signage

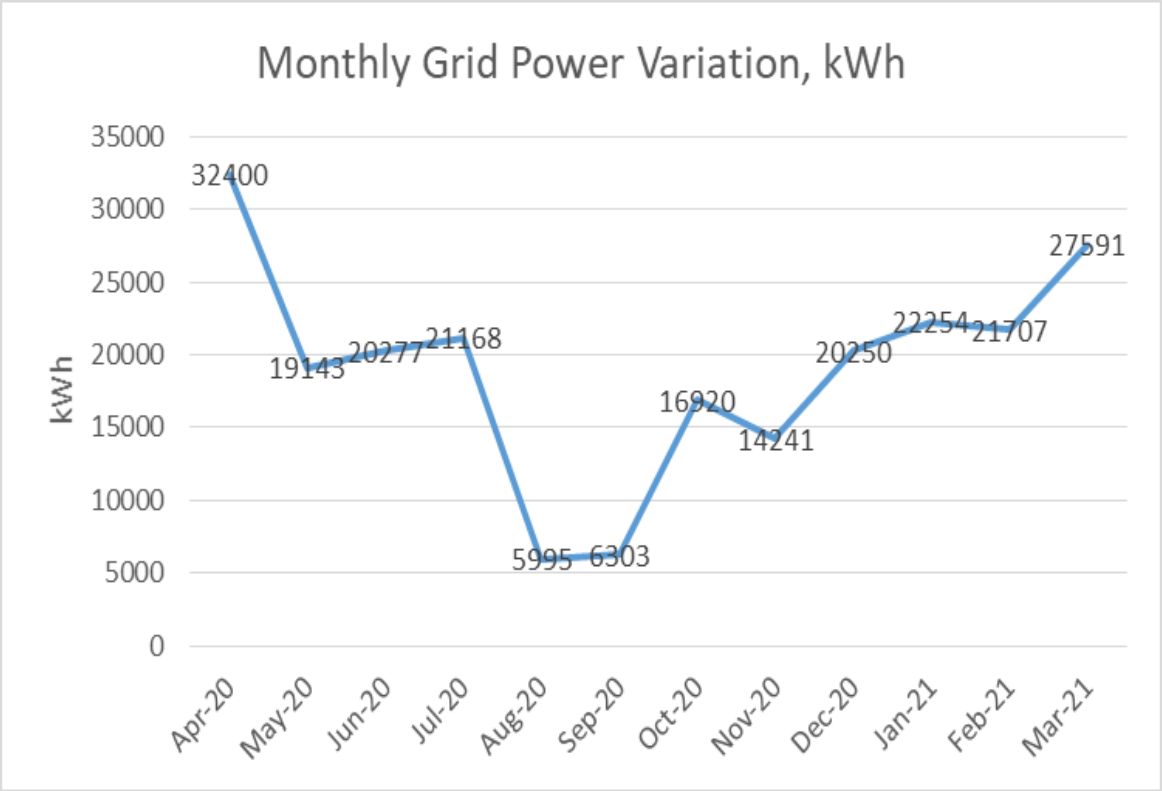
5.7 Energy Efficiency:

Electricity –.

- University has Grid connection for Ajmer Vidyut Vitran Nigam Ltd., with contract demand of 240 KVA and 195 KW solar power plant also installed as Capive source of Power in Net metering scheme.
- For Emergency power during power fails university has installed 500 KVA DG sets.
- The major electricity consuming equipment installed in the ltarnpus are Windows and Split AC, Submersible Motor, Motors, Air Cooler, RO Plant, Desktop, Printer, Fan, Tube light, LED Bulb, Halogen Bulb, Mercury Bulb etc.

- Grid Power Consumption Variation has been shown Below

Figure 8: Grid Power Variation



Energy Monitoring –

- Energy meters are installed on HT, LT side and Each building Input, Energy Monitoring of the Sangam University is very good
- The power factor maintained most of the time is less than 0.95 and the university needs to maintain a unity power factor to avail the incentives by AVVNL.

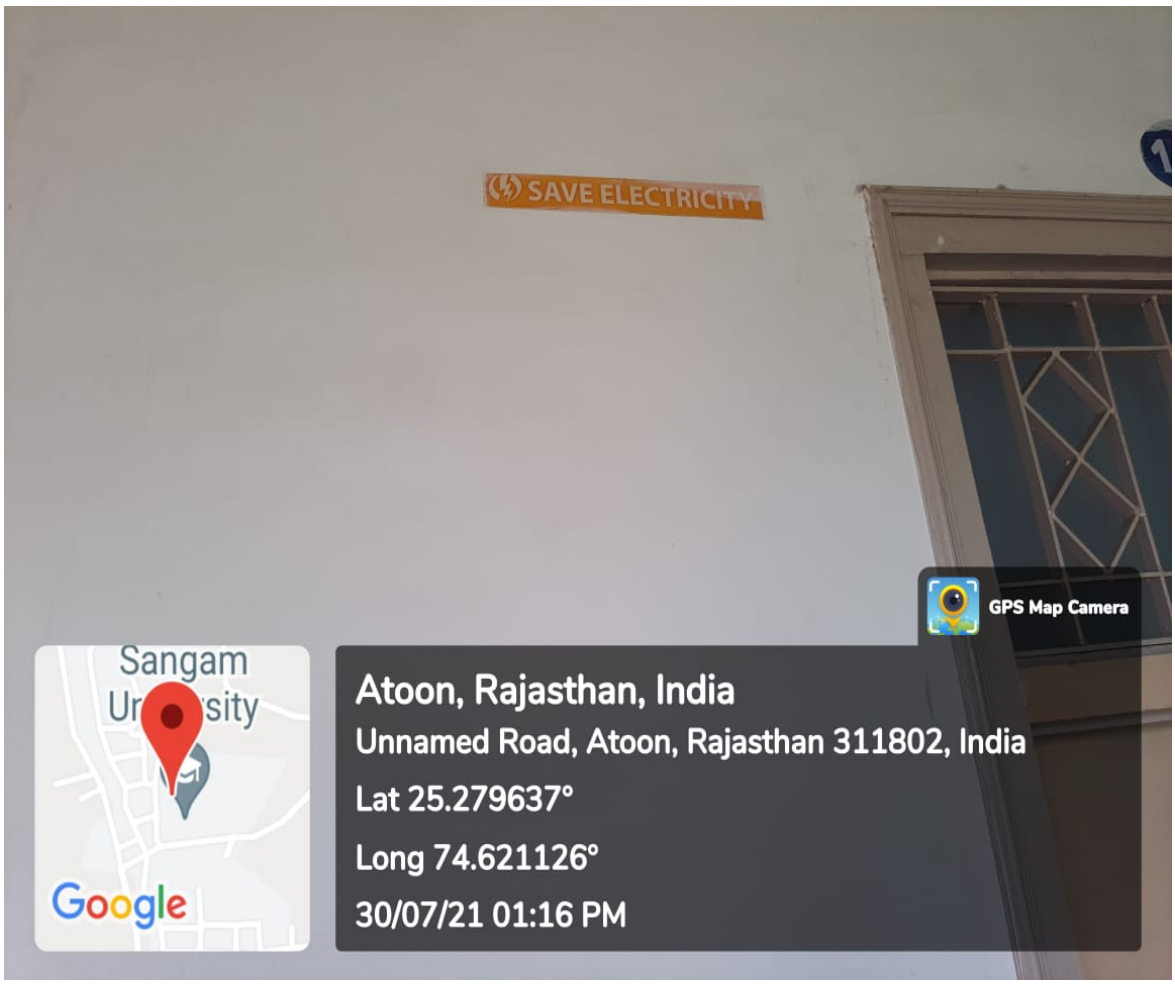
Energy Conservation: Level of Awareness –

The level of awareness for energy conservation is satisfactory. Staff members are interested in taking initiatives for efficient energy use. During audit It was observed that:

- LED tube lights & fans are installed in classrooms and labs. CFL and conventional tube lights are also used. University is in the process of replacing periodically the dysfunctional conventional tube lights with LED lights.
- SANGAM University has air conditioner which are in good working condition.

- It was observed that reflectors are not provided for tube lights which can reduce electricity consumption.
- Signage are present encouraging users to switch off light and fans to save electricity.
- University is exporting power using solar power plant.

Figure 9: Power Saving Signage



5.8 On-Site Energy Generation:

- For Emergency power during power fails university has installed 500 KVA DG sets.
- 195 KW solar power plant also installed as Captive source of Power in the Net metering scheme as Green Power.
- University is exporting power using solar power plant.

Figure 10: Solar Power Plant

5.9 Temperature and Acoustic Control

- White washed rooms, corridors and white/off-white flooring improve the lighting conditions of the campus.
- The entire campus has a sufficient green area to promote environment friendly atmosphere.
- Exhaust fans are provided only in labs and washrooms to exhaust heat.

Figure 11: Green Campus

SANGAM University has done tree plantations all around the building which helps in reducing temperature.

5.10 Paper Waste Management

Being an academic institution, waste paper is the main solid waste generated in the premises. The College has taken steps to minimize and avoid paper usage. It is observed that:

- Prints and photocopies are taken on both sides of the pages to avoid excess paper usage. Rather than a photocopy, digitalization (scanning) is practiced.
- internal notices and communications are through E- maiI/SMS.
- Faculty and administration staff use old papers and envelopes for internal Usages as rough work, file markers, page separators etc.
- Paper notices are displayed on the notice boards. Most of the storage is in the library and staff room. After a couple of years, old submissions and answer papers will be archived and stored in the record room.
- Old papers are given to the vendor in exchange for new papers, in the ratio.

5.11 E-Waste Management

- SANGAM University is digitalized to a large extent. This includes classrooms, library, internal mails, etc.
- E-waste is collected and stored in the respective department. Once a year this e-waste is collected from the respective department and given to the vendor.

5.12 Solid Waste Management

- Wet waste and dry waste segregation are practiced in the premises separate bins are provided for wet biodegradable and dry recyclable waste.
- Biodegradable waste is mainly generated in the canteen but due to Covid-19 no students are available in the university that's why canteen solid waste is negligible.
- The Biodegradable waste is kept in forest areas and over period of time it is converted into manure.
- Scrapped benches are repaired and reused.

5.13 Universal Access and Efficient operation and Maintenance of Building

- College is easily accessible. The staircase is provided for staff and students.
- Since the access and staircases are wide and uncluttered, it is possible to have a safe evacuation during an emergency.

- Fire extinguishers and fire hydrants are provided in few areas for an emergency. They are inspected and serviced by a fire protection Service Company annually.
- There is no signage for the emergency fire exit. This is of crucial importance during an emergency.

5.14 Green belt/ Landscaping

- Large trees are planted on the premises. The plantation also helps to maintain lower temperatures in the area.
- Potted plants are kept at the backside which is brought indoors on certain occasions.
- Indoor plants are kept along the corridors and entrance of the building.

Figure 12: Campus View with Green Surroundings

5.15 Green initiatives

- University is regularly celebrating Milap, Environment Day, and Earth Day, Various Plantation programs, etc.
- Sangam University wins district Green Chaminan Award during 2021.

संगम विश्वविद्यालय को मिला डिस्ट्रिक्ट ग्रीन चैंपियन अवार्ड-2021

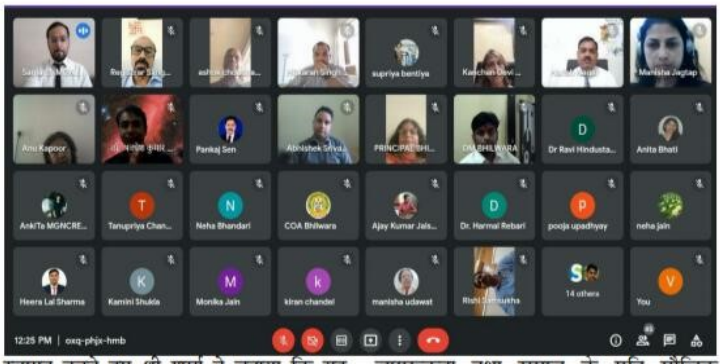
● दैनिक सच्ची रिपोर्ट

भीलवाडा। ऑनलाइन वर्कशॉप स्वच्छता एक्शन प्लान और ग्रीन चैंपियनअवॉर्ड सेरेमनी में महात्मा गांधी नेशनल काउंसिल ऑफ रूरल एजुकेशन, डिपार्टमेंट ऑफ हायर एजुकेशन, मिनिस्ट्री ऑफ एजुकेशन, गवर्नमेंट ऑफ इंडिया द्वारा आयोजित इस कार्यक्रम में भीलवाडा जिला कलक्टर श्री शिवप्रसाद एम नकाते के गरिमामय उपस्थिति में संगम विश्वविद्यालय को स्वच्छ भारत अभियान के तहत डिस्ट्रिक्त ग्रीन चैंपियन अवार्ड-2021 से नवाजा गया ।

स्वच्छ भारत अभियान कार्यक्रम में संगम विश्वविद्यालय के समन्वयक डॉ. श्री हरीश नागर डिप्टी डीन स्कूल ऑफ बेसिक एंड अप्लाइड साइंस ने बताया कि, डिस्टिक लेवल पर स्वच्छता एक्शन प्लान को लेकर एक ऑनलाइन कैम्पियन आयोजित की गई जिसकी थीम ,स्वच्छता एक्शन प्लान 2020-21, ग्रीन स्वच्छता अवार्ड था जो कि महात्मा गांधी नेशनल काउंसिल ऑफ रूरल एजुकेशन डिपार्टमेंट ऑफ हायर एजुकेशन, मिनिस्ट्री ऑफ एजुकेशन गवर्मेंट ऑफ इंडिया ,की तरफ से आयोजित थी। इसमें स्वच्छता विषय को लेते हुए मुख्य पांच बिंदुओं पर फोकस किया गया था जिसमें ,ग्रीन केंपस ,सैनिटेशन एंड हाइजीन, वॉटर मैनेजमेंट, वेस्ट मैनेजमेंट ,एनर्जी मैनेजमेंट, प्रमुख थे ।

राष्ट्रीय स्तर के इस कार्यक्रम के समन्वयक श्री समर्थ शर्मा ,प्रोजेक्ट को-ऑर्डिनेटर महात्मा गांधी नेशनल काउंसिल ऑफ रूरल एजुकेशन मिनिस्ट्री ऑफ एजुकेशन ,गवर्नमेंट ऑफ इंडिया ने कार्यक्रम की शुरुआत विधि-विधान से की ।

ऑनलाइन कार्यशाला में जिले के सभी महाविद्यालय ,विश्वविद्यालय के प्राचार्य एवं प्रतिनिधि प्रोफेसर आदि उपस्थित थे । उनका



स्वागत करते हुए श्री शर्मा ने बताया कि यह प्रतियोगिता पूरे भारत में ऑनलाइन माध्यम से की गई थी, जिसमें 400 विश्वविद्यालयों और महाविद्यालयों को जिला स्तर पर यह अवार्ड प्रदान किया गया , भीलवाडा जिले में संगम विश्वविद्यालय को यह गौरव प्राप्त हुआ है । महात्मा गांधी नेशनल काउंसिल ऑफ रूरल एजुकेशन के द्वारा आयोजित कार्यक्रम की विस्तृत रूपरेखा मनीषा जगताप ने प्रस्तुत की।

जिला कलक्टर श्री नकाते ने संगम विश्वविद्यालय को डिस्ट्रिक्ट ग्रीन चैंपियन अवार्ड 2021 प्रदान करते हुए कहा कि , मैंने विश्वविद्यालय का व्यक्तिगत तौर पर भ्रमण किया है और वहां के वातावरण ,स्वच्छता, व्याख्याता और विद्यार्थियों द्वारा समाज हित में किए जा रहे कार्यों का स्वयं निरीक्षण किया है ,जब भी समाज पर कोई आपदा आती है, तब संगम विश्वविद्यालय परिवार उस आपदा से निपटने के लिए हमेशा तत्पर रहता है तथा प्रशासन को पूर्ण रूप से सहयोग करता है । यह अनुकरणीय है कि ,संगम विश्वविद्यालय शिक्षा के साथ-साथ विद्यार्थियों में सामाजिक जागरूकता तथा समाज के प्रति मौलिक कर्तव्यों का भी पाठ पढाता है ।

इस अवसर पर संगम विश्वविद्यालय परिवार के रजिस्ट्रार प्रोफेसर राजीव मेहता ने इस असीम उपलब्धि के लिए संगम विश्वविद्यालय परिवार को बधाई दी, तथा विश्वविद्यालय में निरंतर सामाजिक जागरूकता के कार्यक्रम की विस्तृत रूपरेखा की भी चर्चा की ।

ऑनलाइन संगोष्ठी में लगभग जिले के सभी शैक्षणिक संस्थान के मुखिया उपस्थित थे यह उपलब्धि संगम विश्वविद्यालय परिवार के लिए गौरव की बात है । इस अवसर पर ऑनलाइन संगम विश्वविद्यालय के डॉ. प्रीती मेहता ,डॉ. श्री शादाब हुसैन, डॉ.गुणमाला गुगलिया, डॉ. श्री अवधेश कुमार जौहरी, श्री अभिषेक श्रीवास्तव, डॉ. श्री जोरावर सिंह , श्री विक्रम सिंह भाटी, श्री किशोर सिंह आदि उपस्थित थे । विश्वविध्यालय के जनसंपर्क अधिकारी लेफ्टीनेंट श्री राजकुमार जैन ने बताया की यह अवार्ड शीघ्र ही जिला कलक्टर श्री शिवप्रसाद एम नकाते द्वारा संगम विश्वविधालय को निजी रूप से प्रदान किया जाएगा।

5.16 Noise Level in the Surrounding of Sangam University

The human ear is constantly being assailed by man-made sounds from all sides, and there remain few places in populous areas where relative quiet prevails. There are two basic properties of sound, (1) loudness and (2) frequency.

Loudness is the strength of the sensation of sound perceived by the individual. It is measured in terms of Decibels. Just audible sound is about 10 dB, a whisper about 20 dB, library place 30 dB, normal conversation about 35-60 dB, heavy street traffic 60-0 dB, boiler factories 120 dB, jet planes during take-off is about 150 dB, rocket engine about 180 dB. The loudest sound a person can stand without much discomfort is about 80 dB. Sounds beyond 80 dB can be safely regarded as Pollutants as it harms the hearing system. The WHO has fixed 45 dB as the safe noise level for a city. For international standards, a noise level upto 65 dB is considered to tolerate. Loudness is also expressed in Sones. One some equals the loudness of 40 dB sound pressure at 1000 Hz. Frequency is defined as the number of vibrations per second. It is denoted as Hertz (Hz).

Objectives of the Study

- To assess the impact on human work efficiency due to road traffic parameters, different noise indices, and attitudinal response.
- To study the temporal pattern of road traffic the study area.
- To study the existing status of noise levels in the study area by recording the noise intensity at various locations.
- Identification and consideration of suitable mitigation and abatement measures.

Measurement Procedure

- The noise level was recorded from the road side offices, organizations, and commercial business center of the road, located at the Front & Back gate areas of Sangam University, Bhilwara.
- At different selected sites of Sangam University, noise levels had been measured. At each spot, the measurements were taken for 60 seconds during day time (6 AM- 6 PM) and noted down the measurements.

Results:

The results of the experiments in both places have been tabulated in the following tables:

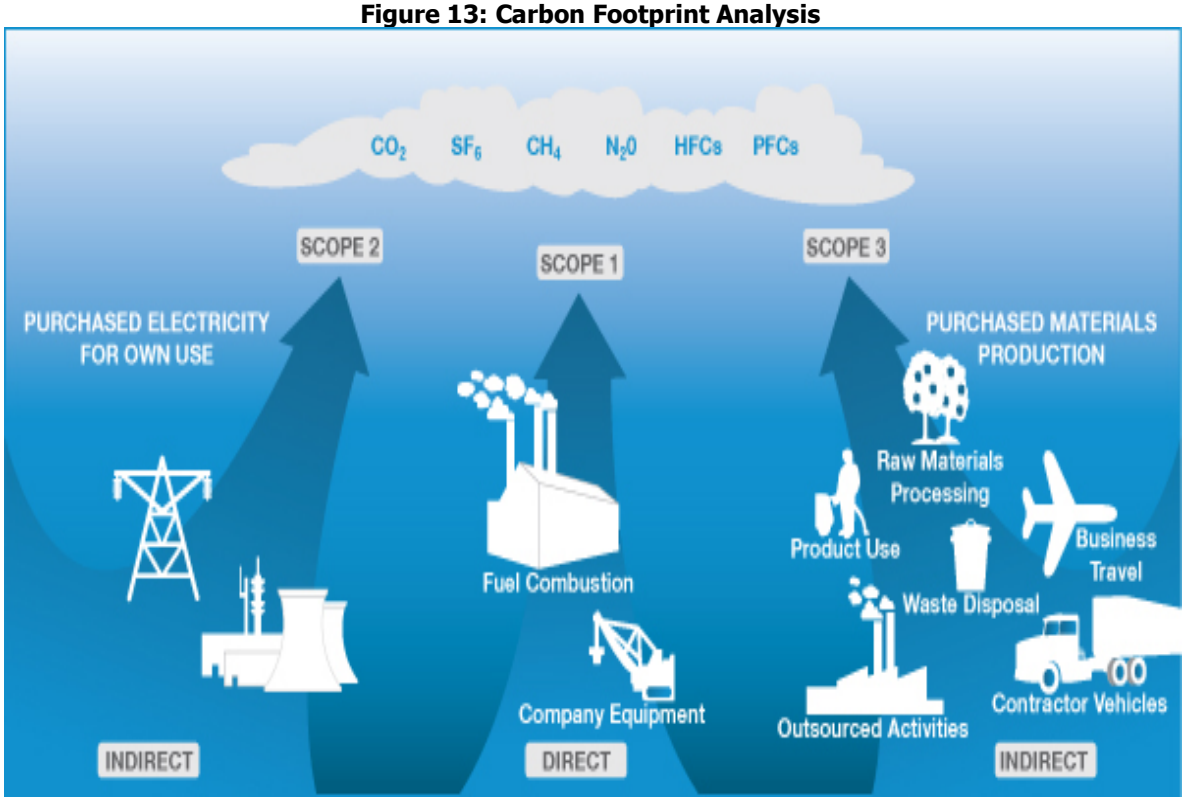
Place	Measurements (duration in Sec.)	Minimum (dBA)	Maximum (dBA)	Average (dBA)
Reception	60	55	60	57.5

Main gate	60	35	45	40
Car Parking	60	50	60	55
Work Shop	60	60	70	65
School of legal Studies	60	30	35	32.5

5.17 Carbon Footprint

Carbon footprint is a measure of the carbon dioxide emissions that is directly and indirectly caused by an activity or is accumulated over the life stages of a product. It is summation of the greenhouse gas emissions of a product or service across its lifetime.

Figure 13: Carbon Footprint Analysis



The 'Study on Carbon Footprint of Sangam University has been undertaken by the RECON in Fy 21-22. The study captured GHG emissions from all the 3 SCOPES as per the GHG Protocol Corporate Accounting Standard of World Research Institute. The GHG emissions factors were sourced from various reputed national & international agencies (CEA, IPCC, CPCB etc.). The total GHG emissions for Sangam University for the year 2020-21 were

estimated at 250 Tons of CO_2 equelent. RECON identified below mentioned sources of green house gases emission estimation opportunities as per the categories:

Table 3: Carbon Footprint Analysis

Category	Source
SCOPE - 1	Company Vehicles
	DG Sets
SCOPE - 2	Grid Electricity
SCOPE - 3	Business travel
	Employee Commute
	Stationary items
	Tea coffee paper cups
	Waste generation
	Postage of Letters

Scope 3 emission incorporate wide range of emissions from supply chain emissions to commuting and the emissions associated with investment and the study has not attempted to quantify all these emissions.

Based on the above Scope RECON & Sangam Team Collected Data Energy Carbon Footprint Study Report is as below –

SCOPE -1			
Particulars	**Fuel Consumption, Ltr**	**Emission Factor**	**GHG Emission**
University Vehicles Diesal Consumption	12011.36	2.6765 Kg CO_2/lit.	32148.405
University Vehicles Petrol Consumption	12011.36	2.337 Kg CO_2/lit.	28070.548
DG Sets Diesal Consumption	5242.14	2.6765 Kg CO_2/lit.	14030.588
Total			74249.541

SCOPE -2			
Particulars	**Grid Power Conumtion, Kwh**	**Emission Factor**	
Net Grid Electricity (After Solar Export)	72285	0.79 Kg/kWh	57105.15
Total			57105.15

SCOPE -3					
Particulars	**Number**	**Average Weight (Kg/Pics)**	**Kg**	**Emission Factor**	**GHG Emission**
Paper RIMS	471	2.5	1177.5	1.8670 kg CO2/ kg paper	2198.39
Register 2Q	306	0.25	76.5	1.8670 kg CO2/ kg paper	142.83
Attendance Register	521	0.06	31.26	1.8670 kg CO2/ kg paper	58.36
Rought Pad	217	0.06	13.02	1.8670 kg CO2/ kg paper	24.31
Pamplete A4	10500	0.02	210	1.8670 kg CO2/ kg paper	392.07
Pamplete	5401	0.01	54.01	1.8670 kg CO2/ kg paper	100.84
Tea & Coffie MUG	40000	-	-	1.1 t CO2 / 2000 cups	22000.00
Waste Generation	0	-	-	0.8421 kg CO2 / kg.	0.00
Postage of Letters	403	-	-	0.02 kg CO2/ Letter	8.06
Employee Commute, KM	649290	-	-	0.14354 kg CO2/ KM	93199.09
Business travel, KM	500	-	-	0.14354 kg CO2/ KM	71.77
Total					**118195.71**
Grand Total, Kg of CO_2 Emmission					**249550**

6. RECOMMENDATIONS / SUGGESTIONS

6.1 Improving Energy Consumption:

- Every classroom and lab with a central switch-board can have a diagram linking the location of a tube light, fan, etc. with a corresponding switch. This will ensure that correct fitting is switched on/ off and can save time & unnecessary operation.
- Installation of automatic lights with sensors can be considered.
- Conduct energy audit every two or three years and determine the lux levels within University. Energy audit can help in reduction in number of light fittings/ energy usage in the University.
- Standard operation Procedures (SOPs) should be prepared and followed for green purchasing. Equipment with star rating, using eco-friendly materials; with safe disposal policy to be preferred.
- Policy of returning equipment at the end of life span to the supplier to be preferred.
- For purchasing new electronic appliances, the star rating provided by the Bureau of Energy Efficiency (BEE) should be considered. The equipment which has maximum star ratings could be purchased, which will consume less energy, ensure environmental sustainability and also operate at low cost.
- Use BLDC fan that consumes less than 50% power than ordinary fans.
- If possible, computers should be switched off from main power connections.
- Notices/signages can be put up/ displayed near switches and on notice boards, informing students and staff to switch off all electricals when not ln use.
- Control sensors can help to reduce consumption by automatically dimming lights when people are not around, and keeping blinds open to use natural light & reduce energy consumption.
- Raise awareness
- Encourage students to help in monitoring energy consumption & implement corrective actions integrate energy education into classroom learning.

6.2 Water Conservation

- Provide information on water usage and savings to students/ staff through notices, screen savers in computer labs.

- Dry sweep or use a sponge broom when possible, instead of using a hose to clean floors, sidewalks, or other hard surfaces.
- Minimize/ reduce water usage by installing water-saving faucets such as press matic taps, tap aerators, jet sprays etc.
- Dual flushing system can be installed for toilet flushing which saves a considerable amount of water.
- Grey water/ sewage recycling system can be installed for flushing toilets. This will reduce the fresh water footprint.
- installation of waterless urinals can be considered to reduce water consumption.
- water balance diagram can be prepared to quantify the water consumption by installing water meters at key points. Based on data gathered, appropriate measures can be taken to reduce water consumption.

6.3 Paper and Other Solid Waste Reduction

- inventories of all solid waste generated in the premises must be maintained.
- Enhance recycling. This can be done by creating a group where students can recycle books, personal clothes and other materials for needy students. This can be an initiative under green program.
- Standard Operating Procedures (SOP) for Solid and E-waste management and recycling of waste should be prepared & practiced. The SOP's may include collection, segregation and reuse of different types of wastes if any (e.g. biodegradable waste for composting). This will help in the safe disposal of waste to recycling agencies.
- Training, as well as awareness programs, should be organized on the segregation of biodegradable waste and recycling of waste. Efforts should be taken to inform students about recycling options and signs should be posted on appropriate bins indicating what could be dumped in each bin.
- The University can introduce online app, which can be useful for conducting internal exams, assignment/ reports submission. This system can also be used for displaying important notices, timetables.
- Paper usage shall be monitored to understand the impact of digitization in the facility.

6.4 Other Aspects of Go Green

- An environmental advisory committee could be formed. The discussions/information sharing among different departments can generate a lot of ideas and awareness on green issues.
- Maintain minutes of meetings of environmental committees; evaluate the effectiveness of various environmental programs conducted by the institutes. Set annual targets for Green initiatives & monitor them closely.
- Create 'Green Champions' since each student uses a computer lab, the screen savers can be set up for creating environmental awareness. (Ergonomics, water conservation, etc.). Short 30 second pop up can be displayed on computer screens when they are on standby mode. Or wallpapers informing students about environment conservation can be created.
- Consider detailed energy audit (energy consumption, thermal emission, visual comfort) and water audit.
- Adopt an environmentally responsible purchasing policy, and work towards creating and implementing a strategy to reduce the environmental impact of its purchasing decision.

Annexure 1: Indoor Gardening Details

Indoor plants are commonly used for their aesthetics benefits but they also have a vital role in reducing airborne pollution. The right choice of plants can be an excellent way of improving indoor air quality and general health. Local landscape contractors can be contacted for the supply and rotation of these plants.

Plants	VOC it Removes	Indoor Source of VOC,S	Plant Care
Aloe Vera	Formaldehyde, Trichloroethylene and Benzene	Chemical-based cleaners and paints	Easy to grow with enough sunlight
Bamboo Plant	Formaldehyde, Trichloroethylene and Benzene	Paints, Plastics, Wood products etc.	Thrives under low light conditions as well as easy to maintain

Chinese Evergreen	Benzene	Paints	Low maintenance plant that prefers low light conditions.
English lvy	Formaldehyde, Benzene, Air borne fecal matter Particles	Wood, Paper products, Airborne fecal - matter particles from pests	Easy to maintain

Janet Craig	Formaldehyde, Benzene and Trichloroethylene	Paints, Plastics, Wood products etc.	Medium to low light tolerant plant Requires little water for growth.
Golden Pothos or Devils Lvy	Formaldehyde, Cleanses air	Exhaust fumes, carpeting materials, paneling and furniture products made with particle board	Extremely easy to maintain under low to bright light conditions. Fast growing and grows well under Fluorescent light.

Mass Cane	Formaldehyde, benzene and trichloroethylene	Paints, Plastics, Wood products etc.	Medium to low light tolerant plant. Requires little water for growth.
Snake plant	Formaldehyde and trichloroethylene	cooking fuels, wood products, facial tissues, personal care products and waxed papers	Drought resistant and Tolerates a variety Of light conditions. Hard to damage or kill.

Peace Lily	Formaldehyde, benzene and trich loroethylene	Paints, Plastics, Wood products etc.	Relatively easy to maintain. Survives in low light conditions.
Red-edged Dracaena	Formaldehyde and trich loroethylene	cooking fuels, wood products, facial tissues, personal care products and waxed papers	Drought resistant and Tolerates a variety of light conditions. Hard to damage or kill.

Spider Plant	Formaldehyde, benzene, carbon monoxide and xylene	cooking fuels, wood products, Printing	Easy to maintain under medium to bright light condition.
Parlor Palm	Purifies indoor air		Easy to maintain

Annexure 2: Green Audit Checklist

GREEN AUDIT CHECKLIST		
Good Daylight Design		
Sr.No.	**Design Feature**	
1	Broad door opening	✓
2	Clerestory/High windows	✓
3	Openings at the eastrern and southern side	✓
4	Rectangular building so that sunlight can reach all areas	✓
5	Sunshade	✓
6	Double pr triple glazing om windows	×
7	Enough illumination	✓
8	Light coloured fabric curtain or blind for window covering	✓
9	operable/ openable windows	✓
10	Ultraviolet(UV) filtering windows	×
11	Use of exterior louvers to control glare	×
12	Use of glass as facilitator of natural light	✓
13	Use of insulated and tinted glass to filter heat gain	×
Ventilation		
Sr.No.	Design Feature	
1	Downdraft cooling system (adownward flow of air)	-
2	Ceiling height	13ft
3	Self movement ventilators in the roof	×
4	Wide corridors	✓
5	operable Windows	✓
6	Use of exhaust fan	✓
Temperature and Acoustic Control		
Sr. No.	Design Feature	
1	Double roof	×
2	Earth air tunnel (cools air in summer and heat it in winter)	×
3	Green roof	×

4	Mud roof	×
5	Openings at the eastern and southeqltde	✓
6	Roof with reflective tile/aluminium/asbestos	×
7	Sand stone cladding outside the walls	✓
8	Special walls for temperature control (Thick/Double/cavity/fire/composite /green)	×
9	Use of cool roofing material (mineral wool, rock wool, vermiculite, foams, expanded polystyrene, extruded polystyrene etc.)	×
10	Use of daylight design (Building is constructed in such a way that diffused sunlight allows light but not the heat)diffused sunlight allows light but not the heat)	✓
11	Use of insulation material (e.g. autoclaved aerated blocks, hollow blocks, Thermocrete or higher R- value material)	×
12	Use of water bodies/fountain	✓
13	Climbing creepers fitted to window in summer	×
14	Lime coating for cool roof	×
15	Retrofitting the existing roofs with cool roof technology	×
16	White wash on the roof	×
17	Use of landscaping as sound barrier	✓
Water Efficiency & Wastewater Management		
Sr. No.	Measures	
1	Aerators to water taps	×
2	Automatic toilet fa ucets	×
3	Drip irrigation (for plant watering system)	✓
4	Dual flush toilet with cistern	×
5	Efficient pl um bing system	✓
6	Sewage treatment plant for sewage recycle	×
7	Rainwater harvesting	✓
8	Regular maintenance for leakage free plumbing system	✓
9	Use of low flow/flow control water equipment or gadget	×
10	Water free urinals (No flush urinals/Zero flush urinals/Wate less urinals/air based flushing system these save water used in toilet)	×
Energy Efficiency and On-site Energy Generation Mechanism		
Sr.No.	Measures	

1	Avoid excessive lighting	✓
2	Computerized monitoring of electrical system	×
3	Integrated energy saving design for natural cooling/heating	✓
4	On-site energy generation	✓
5	Photocell occupancy sensor for automatic light control	×
6	Regular maintenance of electrical system	✓
7	Use of day lighting system	✓
8	Use of energy efficient equipment	✓
9	Use of energy saving bulbs (Compact florescent light/LED lights)	✓
10	Solar panel	✓
Waste Management		
Sr.No.	Measures	
1	Sale of books to its user for minimal charges	Self stock
2	Sale of books to store or other library	×
3	Sale of weeded books to needy students	×
4	Send books and used papers to recycling organization	✓
5	Avoid use of paper by going digital (Paper)	✓
6	Lessen the margins while printing	✓
7	Printing on both sides of paper	✓
8	Reuse of printed paperl envelops	✓
9	Segregation of dry and wet waste	✓
10	Setting up recyclin g area/ composting area	✓
11	Creation of specified junctions for collection of E-waste(E-waste)	✓
12	Donation of computers to NGO's to refurbish and give it to needy people	×
13	Hand over to organization or recycler who knows proper disposal system	✓
14	Implementation of any recycling project or program	✓
15	Purchase of electronic products from company's which have after sales service for the disposal of product with buyback policy	×
16	Installation of bins to collect garbage	✓
17	Outsourcing recycling of garbage to agency	Sale
18	Recreating in to new sustainable products	×

19	Use of coloured bins with code to collect garbage	✓
Environmental Audit		
Sr. No.	Type of audit	
1	Energy audit (includes energy consumption, thermal comfort, visual comfort)	✓
2	Sound/Noise audit (includes indoor noise level, outdoor noise level)	×
3	Water and waste audit (includes water quality, solid waste generation, solid waste disposal process)	×
Universal Access and Efficient Operation and Maintenance of Building		
Sr.No.	Design feature	
1	Easy access to the main entrance of the building	✓
2	Elevator	×
3	Preferred car park spaces for specially abled	×
4	Ramp/ stairs with handrails on at least one side	✓
5	Restrooms (toilets) in common areas	✓
6	Uniformity in floor level	✓
7	Audio guidance for speciall abled	×
8	Availability of wheel chair	✓
9	Braille assistance for speciall abled	×
10	Personalized services by staff for differently abled	×
11	Visual warning signage in common and exterior areas	✓
12	Follow standard procedures for commissioning of electrical/plumbing system	✓
13	Purchase of standardized and quality material for repair	✓
14	Regular maintenance of building	✓
15	Use of chemical free products for cleaning	×
16	User awareness program to minimize damage of property	✓
Green Program		
Sr.No.	Green program	
1	Buying recycled material	×
2	Creation of "Green Team" in the institution/library	✓
3	Green education i.e. to become leader in environmental awareness	✓
4	Collage conduct graduate program by library science/Any other department	×

5	Outreach relationships with local groups interested in environmental concern and satisfy their information needs	✓
6	Provid ing external membership to small and local libraries MOU with other colleges, -internal collegiate library loan)	×
7	Recycling beyond books i.e. paper, aluminum,plastic, e-waste	✓
8	Reduce, Reuse and recycle of the products (At the time of disposal of library materia)	✓
9	Regular purchase of books/magazines reated to sustainability	✓
10	Selection of material content of which informs and assesses green practices (green computing, energy conservation, organic gardening etc.)	✓
11	Contribute library information on sustainability resources to a campus publication,blog or website	✓
12	Creation of topical online resource guide (on sustainability etc.)	✓
13	Disseminating expert advice about sustainability to other colleges to make their own college greener	✓
14	E Publishing reviews of new green resources in the newsletter or news	✓
15	Digitization	✓
16	E-archiving	✓
17	E-resources : E books, Online Journals, membership of consortium	✓
18	Subscription to databases	✓

Annexure 3: Indoor Air Quality Report

ENVIRO-TECH SERVICES

An Analytical Laboratory

(An ISO 9001:2015, 14001:2015 and 45001-2018 Certified Company)

ISO 9001/14001/45001

ETS-LAB

Plot No. 1/32, South Side G.T. Road Industrial Area, Ghaziabad (U.P.) - 201001

email : etslab2012@gmail.com | Website : www.etslab.in | Ph.: 9911516076, 9811736063

TEST REPORT

TEST REPORT NO : ETS/126-5/07/2021 DATE OF REPORT : 30-07-2021

AMBIENT AIR QUALITY MONITORING AND ANALYSIS REPORT

Name And Address Of Customer : M/s SANGAM UNIVERSITY
NH-79, BHILWARA-CHITTOR BY PASS, , BHILWARA,RAJASTHAN, INDIA -

Date Of Sampling : 26/07/2021
Analysis Start Date : 28-07-2021
Analysis End Date : 30-07-2021
Duration Of Monitoring : 26-07-2021 12:00 Hr To 27/07/2021 12:00 Hr 24 HRS
Sample ID No : 126-5/07
Sampling Done By : ETS LAB
Sampling Location : NEAR MAIN CAMPUS

Sampling Method : ETS/STP/AIR-01
Sampling Machine Placed At Height : 1.5 mtr (From Ground)
Weather Condition : Partialy Cloudy Ambient Temperature : 28°C
Wind Direction : W - E

S.No.	Parameter	Unit	Result	Specification/ Limit (As Per CPCB)	Test Method
1	Particulate Matters (Size Less Than 10µm) (PM_{10})	µg/m³	68.9	For 24 Hrs=100	IS:5182 (Part 23)-2006
2	Particulate Matters(Size Less Than 2.5 µm) ($PM_{2.5}$)	µg/m³	28.7	For 24 Hrs 60	ETS/STP/AIR-03 :2019
3	Sulphur Dioxide (SO_2)	µg/m³	12.6	For 24 hrs= 80	IS:5182 (Part 2)-2012
4	Nitrogen Dioxide (NO_2)	µg/m³	17.3	For 24 Hrs=80	IS:5182 (Part 6)-2006
5	Carbon Monoxide (CO)	mg/m3	0.06	For 08 hrs=02,For 01 Hrs=04	IS:5182 (Part 10)-2009
6	Lead (Pb)	µg/m³	ABSENT	For 24 hrs=1.0	IS:5182 (Part-22)-2004
7	Ozone (O_3)	µg/m³	28	For 8hrs=100 For 1 hr= 180	IS:5182 (Part-9)-1986
8	Ammonia (NH_3)	µg/m³	ABSENT	For 24hrs=400	ETS/STP/AIR-08 : 2019
9	Benzo(a)Pyrene (BaP)	ng/m³	ABSENT	For Annual=01	IS:5182 (Part-12)-2004
10	Nickel (Ni)	ng/m³	ABSENT	For Annual =20	IS:5182 (Part-22)-2004
11	Benzene (C_6H_6)	µg/m³	ABSENT	For Annual=05	IS:5182 (Part-11)-2006
12	Arsenic	ng/m³	ABSENT	For Annual = 06	IS:5182 (Part-22)-2004

For ENVIROTECH SERVICES

**** End Of Report****

FOR ENVIRO-TECH SERVICES

Page 1 Of 1

Anil Kumar Chaudhary
(Technical Manager)

CHECKED BY

AUTHORIZED SIGNATORY

Format no ETS/LAB/TR-01 Issue No 05 dt 01/04/2019 Rev No 04 dt 01/04/2019

Note:-
1. This test report shall not be used in any advertising media or as evidence in the court of Law without prior written permission of the laboratory.
2. The sample shall be destroyed after 15 days & Biological / Perishable sample shall be destroyed immediately after issue of test report.
3. The results indicated only refer to the tested samples and listed applicable parameters.
4. Our liability is limited to invoice value only.
5. No complaint will be entertained if received after 7 days of issue of test report.

Annexure 4: Green Champian Award Certificate

तारीख / Date: 09-08-2021
ज्ञापन संख्या / Memo no: 306/MGNCRE/MoE/SAP/BHILWARA/2

सत्यमेव जयते

भारत सरकार /Government of India
महात्मा गांधी राष्ट्रीय ग्रामीण शिक्षा परिषद / Mahatma Gandhi National Council of Rural Education
उच्च शिक्षा विभाग/Department of Higher Education
शिक्षा मंत्रालय / Ministry of Education

District Green Champion Certificate

This is to certify that ***Sangam University, Bhilwara*** is hereby recognized as **District Green Champion** for ***Bhilwara*** District for the Academic Year 2020-21. The Institution has successfully set up the Swachhta Action Plan Committee, adopted and implemented best practices in the areas of Sanitation, Hygiene, Waste Management, Water Management, Energy Management and Greenery Management.

This certificate is given in the presence of **Shri Shiv Prasad M. Nakate, IAS, District Collector, Bhilwara, Rajasthan.**

August 2021

Dr W G Prasanna Kumar
Chairman
MGNCRE, Ministry of Education
Government of India