Green Audit Report 2016-2021

Including Water and Waste Water Audit, Ambient Air Quality Audit, Solid Waste Audit, Carbon Sequestration and Green Cover Audit, and E-Waste Management

Chief Editor

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Co-ordinator Green Audit

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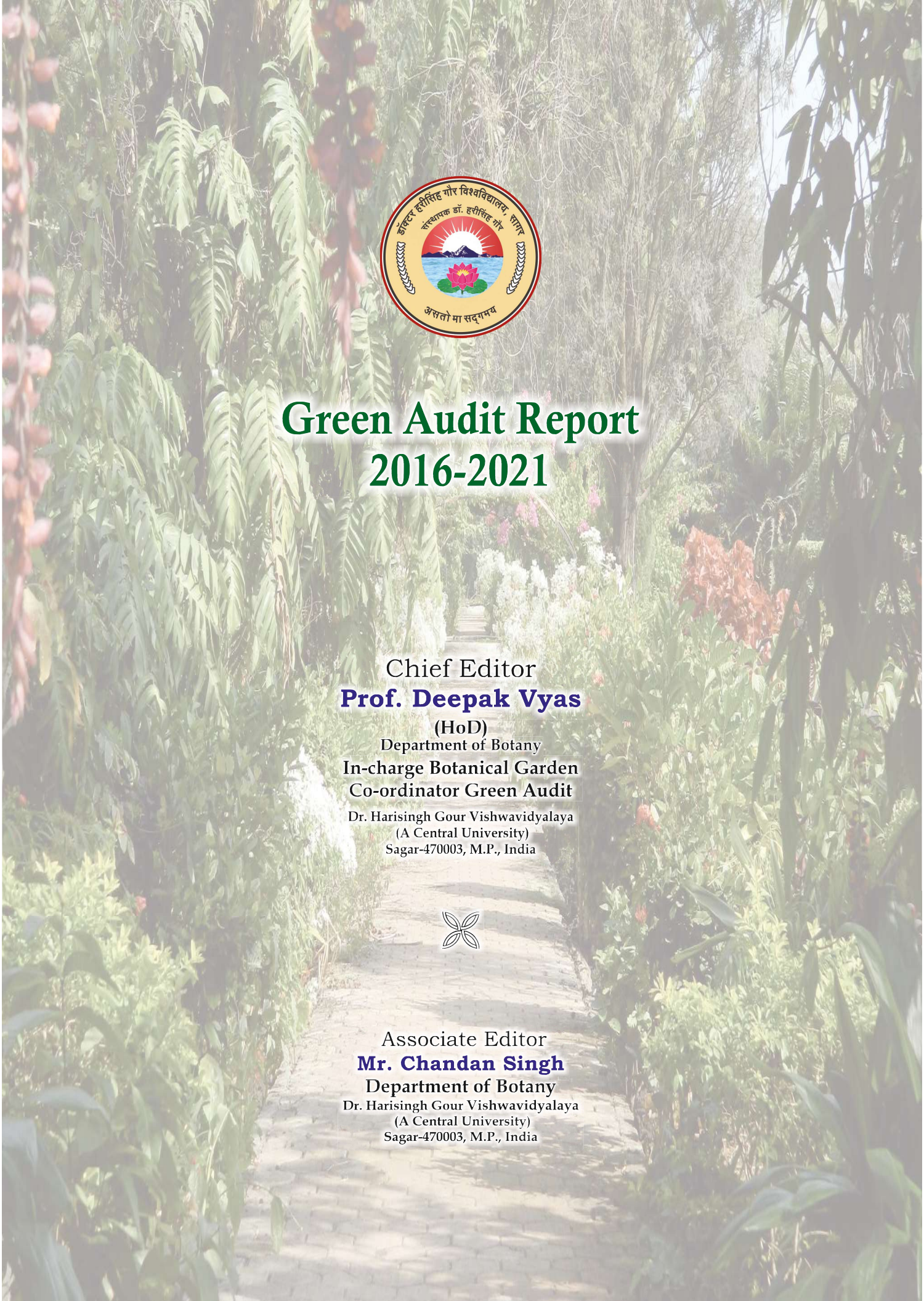

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EDITORIAL

We are celebrating the year 2021-2022 as "Azadi Ka Amrit Mahotsav" since the last two years, the world has been facing the worst pandemic in the form of Corona. The worst cloud of the disease is still persisting and creating great concern for the health of the human population throughout the globe. *In the Era of global warming and climate change, every citizen has to reduce their own carbon footprints to tackle with the adverse impacts of climate change. A green audit of any academic institution reveals ways in which we can reduce energy consumption, water use and reduction in emission of carbon dioxide in the environment. It is a process to look into and ask ourselves whether we are also contributing to the degradation of the environment and, if so, in what manner and how we can minimize this contribution and bring it down to zero and preserve our environment for the future generation. This process of green audit enables us to assess our lifestyle action and assess its impact on the environment.*

Dr.Harisingh Gour Vishwavidyalaya,Sagar, has already taken a step towards the green approach and has conducted a green audit of the university during the year 2021-2022. As an assessment, the environmental conditions prevailing in the university and surrounding of the university, whether in terms of biodiversity, energy management, waste disposal, health sensitization, air quality and social issue, were conducted. The responsibility of carrying out the green scientific audit was given to the Department of Botany. The department has followed the Ministry of Environment and Forest rules and regulations, Govt. of India and the Central Pollution Control Board, New Delhi. The focus was given to assess the consumption of energy, electricity, water, and disposal of liquid waste, solid waste, hazardous waste, e-waste and an inventory of trees on campus is also prepared to check how much CO_2 is sequestered O_2 is released.

The assessment was done related to consumption of resources like water, electricity and handling of solid and hazardous waste, plant species in the botanical garden, in the university and surrounding the university villages were also taken into account. The loss of plant species during the period of Corona was also recorded.

During the preparation of the "Green Audit Report-2021-22", Prof. N. Gupta Vice-Chancellor, encouraged us with her full support. Shri Santosh Sohgaura Registrar, Prof. Ranveer Kumar Director, IQAC, Prof. D.K.Nema Coordinator, IQAC, deans of faculties, and other university officers were also given support to carry out this work. All heads of the department, directors, Coordinators, In-charge of the support services, engineering section, health & sensitization of the university also gave full co-operation.
I must also thank all Faculty, Research Scholars of the Department of Botany, without whom this report could not have been completed.
I hope the efforts made will be helpful for the university to take one green step ahead.

Prof.Deepak Vyas

Chief Editor

Acknowledgement

Dr.Harisingh Gour Vishwavidyalaya, Sagar, has been working at the forefront since its inception by conducting environmental campaigns, workshops, and other extension activities to bring about social change for national and international development. The university in general and the Department of Botany in particular are aware of the needs of the green audit for the maintenance and future developments. In its pursuit of excellence, Dr.Harisingh Gour Vishwavidyalaya, Sagar has recognized itself to improve the environmental quality and maintain its unique pristine ecosystem for the future generation of students and all the inhabitants of the campus. Although we have been taking several steps to conserve and protect our environment, this report of 2016-2021 is the first formal effort to document the results of our investigations and interpret the information of all the required parameters of the Green audit process. Dr.Harisingh Gour Vishwavidyalaya, Sagar, aims to take up the policy and efforts at every level to avert ecological catastrophe on a global scale by supporting the climate neutrality goals committed by the Government of India. As a part of this, efforts are taken to continuously monitor the sustainability of the educational process by constituting this Green Audit Committee consisting of faculty members working in this arena to collect basic data of the environmental parameters within the campus as well as the surroundings so that the environmental issues are resolved. The Green Audit Committee has tried to identify the current / emerging environmental issues so as to monitor the environmental management practices adopted in the University along with the subsequent impact of these on the university environment.

This report is an outcome of efforts of every member of the Department of Botany as well as the Green Audit Committee who undertook this green audit to gather information on every parameter of the environment, compiled and analyzed the data to recognize the immediate and severe threats within the campus so that opportunities can be explored to bring about continuous improvement in our environmental performance and standards by our suggestions and recommendations put forth.

As we have been facing one of the worst environmental hazard in the form of the Covid-19 pandemic for the last two years, therefore it becomes more pertinent that we must understand the environmental impact on all life forms.

Being the coordinator of the Green Audit Committee, my sincere gratitude towards our Hon'bleVice Chancellor madam Prof.Neelima Gupta whose commitment and encouraging efforts have given us the impetus to conduct a survey and document the pieces of information. My sincere thanks to Prof.Ranveer Kumar and Prof. D.K.Nema for giving me the challenging task.

My heartfelt gratitude to my departmental colleagues, research scholars, non-teaching staff, gardeners whose support for compiling data and photographs. I am also thankful to our Health officer Dr. Kiran Maheshwari, university engineers Shri Rahul Giri Goswami, Deepak Singhai,

Mrs Nidhi Jain and other staff of engineering section for helping and providing relevant information pertaining to the Green audit of the University.

My special thanks to my research team and guest faculty, Mr.Shiv Sankar Markam, Dr.Preeti Dubey, Mr. Chandan Singh, Ms. Priya Pathak, Ms. Neelam Chaudhary, Ms.Smita Mishra, Mr. Tinku Kuamr, Ms. Priya Kaushik, Mr. Pranab Kumar Pati for helping me during the completion of the report. Without failing, I would like to mention our gardeners Shri Nand Kishor Patel, Shri Gobind Yadav, Shri Rajendra Patel, Shri Bardichand Meena, Shri Girdhari Patel, helping me in the classification of garden plants as well as forest flora of the region.

D. 8/11/23

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EXECUTIVE SUMMARY

Green auditing is the process of identifying and determining whether the practices of the Institution are eco-friendly and sustainable, for which Dr. Harisingh Gour Vishwavidyalaya, Sagar, conducted the first "Green Audit" for the year 2016-2021 with a primary objective to prepare a statement on the green practices followed by the University and to conduct a well-formulated audit report. Green auditing began with assessing the status of vegetative cover, waste management practices, water use and efficiency, energy conservation strategies, etc. The audit team monitored different facilities at the university campus, determined different types of appliances and utilities (Water cooler, taps, toilets, lights, fan, ACs etc.) as well as measured the usage per item (Watts indicated on the appliance or measuring water from a tap) and identifying the relevant consumption patterns (such as how often an appliance is being used) and their impacts. The staff and learners were asked to get details of usage, frequency, and general characteristics of different appliances. Data collection was done by onsite visit and by direct accounting in different sectors such as water, energy, waste, biodiversity status. The environmental monitoring in the University campus to ascertain the status of the ambient quality of the campus was done.

The present survey revealed a total of 1312.89 hundred acres of land, which existed as a part of the main campus. The DHSGSU campus occupies an area of 20 acres under Botanical Garden, and Forest area more than 100 acres, 5 acres of Play playground and rest is surrounded by forest.

Water auditing was conducted to evaluate facilities of raw water intake and determine the facilities for water treatment and reuse. The potable water quality is within the standard limits. The daily use of the water during 2020-21 was approx—18 lakh L per day. DHSGSU does not have a reusable water treatment facility for wastewater generated from Academic buildings, administrative buildings, library, residential quarters, guest houses, hostels, laboratories, canteen, etc. and thus require attention. The stakeholders of Dr. Harisingh Gour Vishwavidyalaya's residential quarters especially reuse the greywater obtained from the various domestic activities, and they reuse the same water for gardening and vegetable fields etc. Also, water recycling is done as per the direction of the competent authority on a broader scale as and when required.

Rainwater harvesting systems could be improved so that there is a facility available in every building for the reusing of water. The waste collection and disposal were reviewed, and the best way to combat the problems was suggested. On average, various stakeholders generate 434 kg of different types of solid waste per week, respectively. Investigations revealed that Academic Departments of the University have the sufficient number of indoor dustbins installed for solid-waste disposals. On an average, each of these departments has a provision of about 5 dustbins. The teacher's quarters maintain on an average one personal dustbin for solid-wastes disposals and a pit for the dumping of organic wastes. 40% of the Academic Departments and 50% of residential quarters maintain separate dry and wet waste disposal systems. For all the academic departments, administrative office, residential quarter/hostels/guest house and canteens 80 % of the accumulated solid waste, excluding the ones which are dumped in the pits, is lifted by Sagar Municipal Corporation (SMC) every week, which is then segregated and landfilled while for the rest is composted. While the centralized system of solid-waste management involves timely and periodic lifting of the disposed of wastes by the Sagar Municipal Corporation, it is laudable that proper waste management, including composting initiatives, has been adopted. The organic wastes filled in the pits are subjected to composting, which forms a best practice. During the study, it was noticed among the faculty members of Dr. Harisingh Gour Vishwavidyalaya, Sagar by the Green Audit Committee that the majority of the stakeholders (> 90%) were confident about their understanding of hazardous waste and their obligation in disposing of materials. It is evident that hazardous waste, which though is generated in minimal quantity, requires transportation of the university property to an approved treatment facility. It is evident that there is no collection and Management of waste across the campus, but improvements in the overall liquid waste is required to manage the handling and transportation of the generated waste to a treatment facility off the campus. The laboratory liquid is sent to a soak pit, and other liquid wastes are mainly drained to improve the ground level of water.

University does not have any sewage treatment plant yet. Dr. Harisingh Gour Vishwavidyalaya, Sagar, has very efficient mechanism to dispose of E wastes generated from various sources. All these wastes are put to optimal use. All such equipment's which cannot be reused or recycled is being under the process for disposed of through authorized vendors. Instead of new procurement, the Buy-Back option is preferred for technology upgradation. Most departments do not generate large quantities of hazardous waste and can be classified as conditionally exempt small quantity generators (generators of less than 100 grams of

hazardous waste per month). It is evident that hazardous waste which though is generated in very small quantity requires transportation off the university property to an approved treatment facility.

All the buildings of the University are designed and constructed in such a way that during day time lesser electricity is consumed for the lighting of tube lights and other electric lights. Proper daylight and ventilation facilities are available for every building. Dr Harisingh Gour Vishwavidyalaya, Sagar, is taking the initiative to utilize renewable energy has installed rooftop solar panels of capacity 180 KW in Laxmi Bai Girls Hostel to compensate for the necessity of electrical energy within the campus. This has resulted from tremendous curtailment in electricity consumption. Dr. Harisingh Gour Vishwavidyalaya, Sagar, has saved a substantial amount of rupees for the period of almost 3 years, i.e., from 2019 to 2021. On average, 5769 units per day of electricity were consumed by the University. Separate Electricity meters were not found in the Hostels, Academic, and Administrative blocks. There should be a facility to record energy consumption in every building.

The air quality monitoring will be conducted for 24 hour schedule in three shifts (8 hourly duration) at the monitoring station by Pollution Control Board, Sagar MP. The sampling procedures for the measurement of PM2.5, PM10, NO2 and SO2 will be made according to the internationally accepted standard technique. It was estimated that on an average, around 1000 nos. of two-wheelers and 500 nos of four-wheeler vehicles (including vehicles coming to Bank & Post Office) visited DHSGSU Campus in general days per month during 2019-20 excluding the vehicles of campus dwellers. The noise level monitoring was carried out to assess the equivalent noise level (Leq) around the Dr. Harisingh Gour Vishwavidyalaya, Sagar campus, both in the daytime and night time.

It was observed that the ambient noise levels in four locations viz. near administrative building -1, administrative building- 2, in front of library building and in front of bank of Dr. Harisingh Gour Vishwavidyalaya, Sagar is faintly beyond the prescribed standard limit during the peak hours. Ambient noise levels for rest of the four locations are well within the prescribed standard limit during day and night time. The noise levels were high in the administrative areas because of obvious reasons of the congregation of a large number of stakeholders for official works along with large no. of vehicular movement in and out of the building area. In most of the other sampling stations, the Leq levels were within permissible

limits. Due to the reduced population on the campus, the community noise levels at most locations are within the permissible levels.

The biodiversity audit of Dr. Harisingh Gour Vishwavidyalaya, Sagar is a continuous process and efforts of the faculty members, researchers, and the students to assess the living biota and its conservation on for many years. Spread over approximately 13 hundred acres of land, its includes Botanical garden, the university is surrounded by the village and forest, attempt has been made to cover the plant used as sacred plants, phytopathological assessment, soil analysis, soil microflora and others.The Dr. Harisingh Gour Vishwavidyalaya Sagar campus is home to different varieties of fauna as well as flora. However, the best effort was made to record the flora and fauna of the campus, which has been mentioned in the report.

Finally, it can be concluded that the Green Audit Report-2016-21 will help in assisting the process of an eco-friendly approach to the sustainable development of the Dr. Harisingh Gour Vishwavidyalaya, Sagar Campus. The observation, suggestions and recommendations specified at every section will guide the university authority in formulating suitable policy for the University so as to improve the quality of environment within the Dr. Harisingh Gour Vishwavidyalaya, Sagar campus by defining its goal such that the concerted efforts can bring about an impact at the global level.