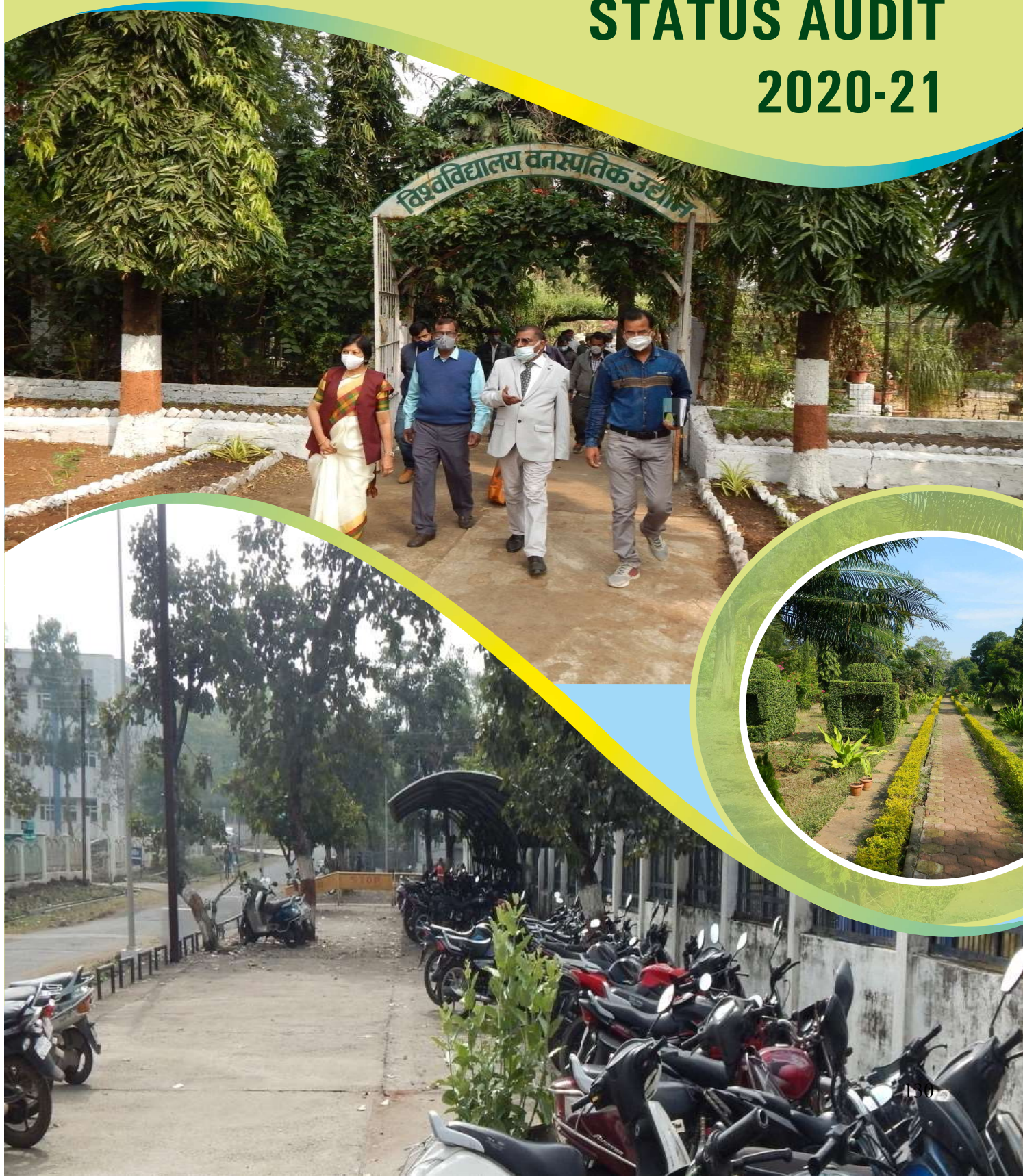


CHAPTER-12

AMBIENT AIR QUALITY STATUS AUDIT 2020-21





CHAPTER-12 AMBIENT AIR QUALITY STATUS AUDIT

The university is situated 5 Km. east of Sagar city, and its campus covers an area of 1312.89 acres over Pathatiya Hills connected to the Vindhya Range, surrounded by lush green forests (about 100 acres) within its campus and has effectively contributed to the maintenance and preservation of ecosystem and its biodiversity. It is one of the finest picturesque campuses in India. Since its forest cover is so enriched that city people and surroundings, people go for both morning and evening walks, the university has ambient air quality naturally.

Over the years increase in vehicular movement, the air pollution in the campus is gone high. However, to date, no proper assessment has been done. Air quality assessment is frequently driven by the need to determine whether a standard or guideline has been exceeded. This overshadows another objective of air quality assessment: providing the information needed to estimate population exposure to air pollution and the effects on the health of the population. Consequently, most existing air quality monitoring systems do not fully address population exposure to toxic air pollution. Given the importance of these data for air quality management, this report describes strategies and methods for providing information on ambient air quality that is adequate for health impact assessment.

Faculty members, students and other mistrial staff exposure to air pollution may result in a variety of health effects, depending on the types of pollutants, the magnitude, duration and frequency of exposure and the associated toxicity of the pollutants of concern. People are exposed to air pollutants both indoors and outdoors, depending on the activities of individuals. It is important to assess the exposure levels of different population groups. Health impact assessment combines population exposure estimates with information on toxicity or the relationship between exposure and response.

Information on the relationship between exposure and response is necessary to estimate the potential health risks. The estimates of health effects for a population base are typically calculated in terms of predicted excess negative health effects caused by



exposure to a certain level of air pollution. This involves combining the information on the response to certain concentrations derived from epidemiological or toxicological studies with the number of people exposed to each concentration of air pollution in the community being assessed.

The report discusses the primary requirements for designing and operating networks for monitoring ambient air and a range of air quality. The report does not detail monitoring practices and methods. However, it is intended to prompt good monitoring and health impact assessment practice. To this end, several important issues are identified, and recommendations are made on each step of the process of monitoring air quality.

Designing and planning a monitoring system:

- Local pollution control board measure air quality which is insufficient to monitor the whole area of the university. Thus there is a need to address the evaluation of exposure to toxic pollutants and assessment. Air monitoring systems often do not fully address the evaluation of population exposure to toxic air pollutants and the assessment of the resulting health effects.
- Since over one year due to Covid-19 the vehicular traffic in the university is reduced, but after the university resumes with its full swings, as per the university's security department, the movement of the approx.500 two-wheelers and around 200 four-wheelers are recorded per day. Due to construction works dust pollution level was also increased.
- The design of new monitoring programmes or refinement of existing systems should therefore consider the need to use the data measured for the purpose of assessing the effects on population health.
- The pollutants need to be studied, measurement time scales and locations should be relevant to assessing human exposure and the expected health effects. Since local conditions and pollution climates will determine the pollutants and methods to be given priority.
- Monitoring should have many objectives besides health impact assessment. Together with resulting data quality objectives, these objectives need to be clearly defined when monitoring systems are designed or updated.
- Monitoring is only one of a range of tools for assessing air quality; monitoring, emission and predictive models must be complementary components in an integrated approach to assessing exposure and health effects.



Cost-effectiveness of assessment programmes

- Investment in monitoring, assessing and controlling pollution helps to avoid outcomes to health and ecosystems that are usually more costly than preventive action.
- Monitoring programmes need to be cost-effective, have stable financial, material and personnel resources, and adjust to university needs and conditions.
- Attempts should be made to use the simplest technologies and procedures consistent with fulfilling the overall monitoring objectives.
- In addition to initial capital expenditure, financial planning of monitoring programmes needs to take full account of ongoing expenditure for system maintenance, operation, data management and quality assurance and control.

Quality assurance and control

- Comprehensive quality assurance and control of monitoring programmes is essential to ensure that measurements are accurate, reliable and fit for the intended purpose.
- Harmonization of measurement quality – at both a national and international level – should be promoted through national quality assurance and control coordination, laboratory accreditation and international validation programmes.

Managing and disseminating information

- Raw measured data are of limited utility; these need to be transformed by appropriate analysis and interpretation into useful information targeted at the needs of a wide community of end-users. These activities require special expertise, infrastructure and funding.
- Possible end-users may include scientific and health communities, policy and planning decision-makers at the national level, the mass media and the general public.
- Data and information from monitoring programmes should be communicated to users in the scientific and health communities in a form and time frame appropriate to their specific needs.
- Every person has the right to know about the quality of the air he or she breathes. Disseminating information on air quality to the public serves to inform, educate and raise awareness of important environmental and health issues.
- An informed and aware public can also contribute and assist in a meaningful way to improving the environment. Public communication and education schemes are therefore recommended.
- Free international exchange and dissemination of air quality information is recommended, using such freely and openly available communication media as the World Wide Web.



Assessing population exposure

- Ambient air quality should be considered an indicator of true population exposure since factors related to buildings and indoor sources of air pollution influence personal exposure.
- To serve the needs of health impact assessment, air quality assessment should cover the full range of population exposure to ambient air p
- Assessment of population exposure should address the differences in air quality within university campuses by considering a typical time-activity pattern and involving a time-weighted average calculation.
- Determining population exposure correctly requires knowing the population distribution and location of air monitoring stations to identify the pollution concentrations. The major sites are the university office, library, and university teaching departments. These are the hotspots of vehicular traffic since the residential area has restricted entry; therefore, it has lesser pollutants. Hence proper maintaining is required.

Applying relationships between exposure and response

- The mathematical form of the relationships between exposure and response can vary depending on the toxicity of the pollutant.
- The concentration and exposure data for a given pollutant should be consistent with the corresponding averaging time specified by the relationships between exposure and response or other information on health effects.

Relationships between emission sources and air quality

- Ambient pollution sources in the university environment include only mobile sources of emission. These sources must be identified to enable effective management action to reduce exposure.
- Air quality dispersion and statistical models are needed to be used to complement existing monitoring networks and are essential components of a comprehensive programme of air quality management.
- Dispersion models are used to select the location of representative or hotspot monitoring sites to measure either typical or high pollution concentrations.
- Air quality models are often used to develop optimum and cost-effective source-specific programmes to reduce emissions to protect human health.
- Attempts are being made to promote battery-operated two-wheelers in the campus.



Figure 15: Glance of the vehicle at the university campus.



Figure 16: Battery operated vehicle in the University Campus.