Article

Assessment of the environmental perceptions, attitudes and awareness of city dwellers regarding sustainable environmental management of Nanded District (MS), India

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Received 1 July 2024; Accepted 8 August 2024; Published online 10 September 2024; Published 1 December 2024

Abstract

Air pollution is one of the biggest problems of our time because of its effects on both public and individual health as well as climate change. These air pollutants cause respiratory and cardiovascular disorders by penetrating the respiratory system through inhalation, making them significant contributors to human disease. Environmental issues pose a serious threat to the development of a sustainable urban environment, especially in many developing country cities. The research region for this study was selected to be the Nanded District (MS). The level of environmental perception among the residents was evaluated, and their attitudes and awareness toward the environment were looked at in this study. According to the current study's findings, respondents' perceived knowledge of the causes and effects of environmental contamination ranged from moderate to high. They also intended to lessen the contamination of the environmental behaviours of its residents. The results of this study can be applied globally in decision-making processes about sustainable ecosystems.

Keywords climate change; pollution; sustainable environment; public health.

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Proceedings of the International Academy of Ecology and Environmental Sciences
ISSN 2220-8860
URL: http://www.iaees.org/publications/journals/piaees/online-version.asp
RSS: http://www.iaees.org/publications/journals/piaees/rss.xml
E-mail: piaees@iaees.org
Editor-in-Chief: WenJun Zhang
Publisher: International Academy of Ecology and Environmental Sciences
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1 Introduction

The previous few decades have seen significant changes to the global environment, and a variety of problems related to environmental degradation now face us (Alexandarand Poyyamoli, 2014). Human activity pollutes

the soil, water, and air we breathe, which has a detrimental effect on the ecosystem. Despite being a significant advancement in technology, society, and the provision of various services, the Industrial Revolution also resulted in the vast production of airborne pollutants that are harmful to human health. Undoubtedly, global environmental contamination is seen as a complex international public health issue. Along with lifestyle decisions, this important topic is connected to social, economic, and legal challenges. Today's world is certainly experiencing unprecedented and alarming levels of urbanization and industrialization on a worldwide scale. During the COVID-19 lockdown, there was a notable drop in PM2.5 and PM10 levels, primarily as a result of reduced vehicle traffic. Air pollution is mostly caused by vehicle exhaust (Kar et al., 2021).

Serious changes to our environment, such as the extinction of species, pollution of the air, soil, water bodies, and noise, have led to an increase in the frequency of natural catastrophic events. Human activities including industrialization, deforestation, urbanization, and the manufacture of environmentally harmful items have led to the occurrence of global warming, the depletion of the ozone layer, and volcanic eruptions (Selvamand Nazar, 2011). The impact of air pollution on human health is well-known, and its rise has become a daily occurrence. According to US-based research, exposure to fine particulate matter (PM) can shorten life expectancies (Pope et al., 1995) and there is a link between air pollution and poor respiratory outcomes, including cardiac-related deaths (Brunekreefand Holgate, 2002). The fact that air pollution causes around 9 million deaths annually, it is one of the largest threats to public health in the world (Manisalidis et al., 2020). According to a forecast, six to nine million people could die each year in 2060 as a result of unregulated ambient air pollution (Lanziand Dellink, 2019). The issue is particularly severe in emerging nations (Mannucciand Franchini, 2017) because of overcrowding, unchecked urbanization, and the advancement of industrialization. This results in poor air quality, particularly in nations with high levels of socioeconomic inequality and low knowledge of environmentally friendly management practices.

The Indian government, together with numerous state governments, has implemented several measures to tackle air pollution. National human development routes, however, will not be desired nor sustainable unless individuals can meaningfully engage in the events and processes that shape their lives. In light of this, we performed a random survey to find out how the nation's general public felt about the state of air pollution and the various mitigation techniques available to address it. Given the state of affairs, environmental consciousness becomes essential to prevent future exploitation of our biotic natural systems. People's participation in environmental concerns would closely correlate with their level of environmental awareness (Schmidtand Blumentritt, 2007). The exploitation of environmental resources will be reversed by a rise in environmental awareness (Omoogun et al., 2016). Being aware of the state of the environment today is a prerequisite for being environmentally conscious. To achieve environmental sustainability, people must develop a set of attitudes and behaviours in addition to environmental awareness (Abbasand Singh, 2014). The outcome of the present survey will be helpful in the design of upcoming environmental initiatives.

The objectives are to (1) Evaluate people's awareness of the environment and how individuals behave concerning the environment; (2) To determine people's desire to participate in activities linked to environmental awareness; (3) To guide and mold the behavior of the youth population to improve the state of our environment. To accomplish environmental sustainability, public involvement in environmental protection has become increasingly important as a result of environmental consciousness. To better understand environmental awareness, attitudes, and commitment, a microstudy on the subject is being conducted among the residents of Nanded district (MS), India.

2 Study area and Methodology

2.1 Study area

The study was carried out in several villages in the Indian state of Maharashtra's Nanded District. The District of Nanded is located between latitudes 180 15' and 190 55' North and longitudes 770 to 78025' East. Its total area is 10,332 square kilometers. The state's southeast region is where it is situated. Among other things, Nanded City is well-known for its new developments, busy urban life, historic significance, traditional marketplaces, and cultural heritage. This city is overcrowded because people from surrounding areas move here in search of better employment prospects, medical care, and education opportunities. Due to the inadequate and careless environmental behavior of its citizens, the city suffers from serious environmental issues such as rapid population increase, unplanned urbanization and industrialization, incorrect waste management, climate change, and pollution. For this study, the Nanded district was chosen as a study area. Residents' opinions, attitudes, and levels of awareness regarding environmental pollution were also evaluated, as were their environmental concerns regarding their place of residence and the surrounding environment.

2.2 Sampling, surveying, preparing questionnaires, and choosing parameters:

Only a few defined demographic factors were chosen for this study, and their impact on public attitudes, perceptions, and awareness of the environment was investigated. These demographics included gender, age group, educational attainment, and type of occupation. Although secondary data were also employed, primary data constituted the majority of the study's basis. As a key method of data collecting, assessments of environmental perceptions and attitudes were carried out. A semi-structured questionnaire was developed through expert interviews and a study of relevant research (Gambo, 2004; Singh, 2016). After that, the questionnaire was assessed, and before it was finalized, a survey was carried out.

The study's questionnaire has been divided into five sections: impact of air pollution, effects of air pollution on human health, various sources of air pollution, various air pollution control strategies, and the application of various air pollution control strategies according to themes. A cross-sectional survey was carried out in India's Nanded district (MS). The data and information used in this study were gathered from all students attending colleges and universities, employees, and others who were aware of global warming through an online Google questionnaire. To improve the review parts of the current work, secondary data was gathered via reading a variety of relevant publications and earlier research projects, sourced from books, journals, and published and unpublished sources.

3 Results and Discussion

3.1 The demographic profile of the participants in the research area

Table 1 presents the factors used in this study as well as the demographics of the respondents. Approximately 55.00% of the 324 individuals who responded to the Google survey form in the current study were male, and 45.00% were female (Fig. 1). The age group of 18–35 accounted for about 59.25% of all respondents, followed by 36–59 for 32.09%, and older than 60 for the least number of respondents (8.64%). Of the respondents, about 33.95% had completed their UG/PG degree, about 29.62% had finished their board education, about 22.83% had completed their secondary education, and just 13% had only completed their primary education. The study area's participants were employed in several professions. Of the respondents, about 16.13% worked in a variety of services (accountants, bankers, doctors, engineers, teachers, lawyers, police officers, etc.), and about 69.13% were students in school or college. As indicated in (Table 1), 11.11% of the respondents were farmers, while 3.08% belonged to other occupations.

Parameter	Specification	Frequency (n=324)	Percentage (%)
Gender	Male	178	55.00
	Female	146	45.00
Status	Youth (18–35)	192	59.25
	Adults (36–59)	104	32.09
	Elder (>60)	28	08.64
Education	Primary	44	13.58
	Secondary	74	22.83
	Board	96	29.62
	UG/PG	110	33.95
Occupation	School/Collage Students	224	69.13
	Servants	54	16.66
	Farmers	36	11.11
	Others	10	03.08

Table 1 Participants' demographic composition.

3.2 Environmental perceptions and attitudes of the respondents

Approximately 55.00% of the 324 individuals who responded to the Google survey form in the current study were male, and 45.00% were female (Fig. 1). The majority of those surveyed were conscious of the effects of air pollution. According to the study, their impacts on agricultural production (11.72%), climate (26.0%), visibility (18.51%), and human and animal health (43.77%) are among them. Human health, especially the respiratory system, is thought to be most negatively impacted by air pollution (48.14%), (Fig. 2). Air pollution, however, also has mild impacts on the skin (14.81%) and eyes (16.04%) and substantial effects on the cardiovascular system (20.98%) (Fig. 2).









According to the perception of the surveyed population, automobiles (32.71%) and industries (21.98%) are the major source of air pollution in the city, followed by residential fuel burning (15.43%), waste burning (14.81%), road dust (5.55%) and agricultural residue burning (ARB) (3.08%) as indicated in Fig. 3. The survey indicates that industrial emission control (22.22%), ban on crackers (34.56%), control on open burn waste/agro-residues (16.66%), transport emission control (11.11%), and road cleaning and management (8.64%) are the most important strategies to control air pollution of the city (Fig. 4). Additionally, the survey indicates that the control of dust emissions from construction sites (6.79%) is perceived to have theleast effect on controlling air pollution all over the city. The survey population unanimously indicated that encourage waste to energy conversion (16.66%), enhancement of public transport system (16.04%) and electric mobility (14.81%), enhancement of use of renewable energy (14.19%), improvement in automobile engine techniques (12.96%), introduction of clean fuel in automobiles (11.11%) and cleaning of industrial processes (8.64%) needs to be prioritized all over the city to effectively control air pollution. It is believed among the policymakers that creating public awareness about air pollution should be a priority among other abatement strategies. However, the present study alsoindicates that this should be one of the priorities to control air pollution (Table 2).

Sr. NO.	Questions were asked the impact of environ	estions were asked in the questionnaire to respondents regarding e impact of environmental pollution and awareness.		Response and perceptions of people	
		· · · · ·	Frequency (n=324)	Percentage (%)	
1.	Impact of air	Human and Animal Health	142	43.77	
	pollution	Visibility	60	18.51	
		Climate	84	26.00	
		Agricultural Productivity	38	11.72	
2.	Effects of air	Respiratory	156	48.14	
	pollution on human	Cardiovascular	68	20.98	
	health	Eye Problem	52	16.04	

Table 2 Showing questions asked in the questionnaire to respondents and their responses.

		Skin Problem	48	14.81
3. Different sources air pollution	Different sources of	Automobiles	106	32.71
	air pollution	Construction activity	24	07.40
		Industry	68	20.98
		Road dust	18	05.55
		Residential fuel burning	50	15.43
		Waste burning	48	14.81
		Agricultural Residue Burning (ARB)	10	03.08
4.	Different strategies	Ban on crackers	112	34.56
	to control air	Controlling dust emissions from construction	22	06.79
	pollution	activities		
		Controlling open burning of waste/agro-residues	54	16.66
		Industrial emission control	72	22.22
		Road cleaning and management	28	08.64
		Transport emission control	36	11.11
5.	Implementation of	Encourage waste-to-energy conversion	54	16.66
	different strategies	Enhancement of electric mobility	48	14.81
	to control air	Enhancement of public transport	52	16.04
	pollution	Enhancement of the use of renewable energy	46	14.19
		Improved automobile engine technology	42	12.96
		Introduction of clean fuel in automobile	36	11.11
		Introduction of cleaner industrial process	28	08.64
		Public awareness programs	18	05.55

4 Conclusions

One of the most significant environmental risks today is pollution and climate change. The Intergovernmental Panel on Climate Change (IPCC) of the United Nations noted several significant consequences for human health and declared that there is clear evidence that humans are changing the planet's climate (Pachauriand Reisinger, 2007). Using the Nanded district as an example, the current study examined public perceptions, attitudes, and understanding of the causes, impacts, and controls of environmental pollution to support a healthier urban environment. When demographic information was taken into consideration, both male and female study participants indicated moderate to high opinions regarding the environment and attitudes.

Concern for the environment was higher among those where well-educated, employed, and well-paid than among other demographic groups. It was found that those with higher levels of education (33.95%) were more concerned with environmental rules and regulations. Dr. Tedros Adhanom Ghebreyesus, the General Director of the WHO, referred to air pollution as "the new tobacco" and a "silent public health emergency" in 2018 at the first WHO Global Conference on Air Pollution and Health (World Health Organization, 2019).

By emphasizing environmental awareness and relevant issues, we hope to highlight and suggest policy changes by the government and educational institutions through this poll. We hope that this survey will raise awareness of environmental issues in educational institutions and societies at large. Adopting environmentally responsible actions can contribute to improving the public space. Therefore, a city's pro-environmental attitude may raise living standards and ensure the sustainability of the environment.

Changes in behavior strategies are necessary for encouraging people to be more environmentally compassionate. The results of this study can be applied to decision-making and the development of cleaner city solutions. To create a worldwide evaluation of factors, the method can be implemented in more countries and cities.

Acknowledgement

The authors express their gratitude to all of the surveyors who took part in the questionnaire survey and for their eager contribution.

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