

INTERNATIONAL JOURNAL OF LEGAL STUDIES AND SOCIAL SCIENCES [IJLSSS]

ISSN: 2584-1513 (Online)

Volume 2 | Issue 4 [2024] | Page 53 - 58

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SHADOWS OF URBANIZATION: UNRAVELLING THE ESCALATION OF BLACK CARBON EMISSIONS IN GUWAHATI CITY

- Arista Priyadarshini¹

“We are living on this planet as if we had another one to go to”

-Terri Swearingen

ABSTRACT

Since the beginning of time human beings have always strived to have a better life with all facilities. Recent years have seen huge changes in society as a result of unparalleled urban growth and innovations developed to meet the needs of the growing global population. While urbanisation is necessary for social progress and economic growth, it has had a substantial impact on environmental sustainability. This relationship between urban development and environmental sustainability is very delicate. Cities are known for their excessive energy consumption, uneven land use, transportation and unbridled greenhouse gas emissions which are responsible for contaminating the natural environment. In the shadow of urbanization, urban cities are constantly involved in activities that is destroying the ecological imbalance and environmental sustainability. Eventually, a situation will come which cannot be remedied or repaired. In order to prevent urbanisation from becoming a barrier to sustainable development, it is imperative to have a clear understanding of its implications and take every necessary action to achieve the highest standard of a sustainable and healthy environment.

Keywords: *Urbanization, Environmental Sustainability, Particulate Matter, Sustainable Development, Greenhouse Gas Emissions, Black Carbon*

¹ Research Scholar, University Law College & Department of Studies in Law, Bangalore University, Bengaluru.

INTRODUCTION

The recent evolution of urbanization patterns has led to an increase in population occupying restricted spaces in metropolitan areas, ultimately resulting in unplanned and improper growth of urban sprawl, inadequate housing, traffic congestion, and overcrowding. Converting vacant or thinly populated land into densely populated cities has created a number of issues, the most significant of which being environmental harm. Since urbanization is seen as a sign of development, it cannot be stopped, but it must be made sure that it continues within reasonable boundaries while protecting the environment. One serious environmental effect that all the human beings are witnessing is the uncontrollable degradation of air quality around us. Every year, air pollution have caused millions of early deaths, Particulate matter inhalation being the primary cause.

The loss of green areas and natural habitats brought about by urban expansion frequently impairs ecosystems' capacity to adjust to changing climatic circumstances. Urbanization is a significant driver of air pollution due to various human activities associated with city life. The density of people, vehicles, factories, and improper energy use in cities all contribute to the air pollution. Along with an increasing population, comes poor waste management techniques, which contaminates the ecosystem and renders the air unfit for human habitation. These activities lead to emission of a pollutant known as Black Carbon. It is imperative that the problems with air pollution brought on by urbanization be addressed right away. People have the fundamental right to reside in an atmosphere devoid of dangerous pollutants.

THE SURGE OF BLACK CARBON EMISSIONS IN GUWAHATI

Indeed, a number of environmental issues can arise from cities' constant growth and development which contribute to emission of Black Carbon. Urban cities are constantly developing, and the primary cause of the rise in air pollution is all the anthropogenic activities associated with development. Much of Assam's population breathes air that is contaminated, with Guwahati ranking highest among the state's most polluting cities.

An Understanding of Black Carbon- Meaning and its Detrimental Effect

Black carbon is a component of fine particulate matter produced by incomplete combustion of fossil fuels, diesel exhaust, biofuel, and open burning of biomass. It is a short-lived particle that stays in the atmosphere for about a week after it is released, in contrast to carbon dioxide, which can stay in the environment for up to 100 years. The earth's atmosphere grows warm due to black carbon in a variety of ways. Initially, atmospheric brown clouds are created when black carbon is released into the atmosphere and mixes with other aerosols. By absorbing solar radiation and blocking direct sunlight, it concurrently warms the planet. In turn, it influences weather patterns by decreasing precipitation and raising the likelihood of droughts.²

Urban progression often results in the conversion of green spaces and natural habitats into buildings and infrastructure due to increasing population, leading to the loss of biodiversity and disruption of ecosystems. Manufacturing and industrial activities often involve the combustion of fossil fuels, contributing to the release of black carbon. Improper waste disposal practices, including open burning of waste in urban areas, and continuous emissions from vehicles also contribute to emitting black carbon.

Urbanization and its impact in Guwahati city

Guwahati, the largest metropolis in North Eastern India and is one of the fastest growing cities in India. The 'gateway' to North East India, is a city in Assam, which is constantly growing and expanding to incorporate all the people who have migrated from different cities in search of better job, educational or medical facilities, and better living standards as it is the commercial and technical hub of North Eastern part of India.

There are serious concerns of environmental degradation in the city as a result of the pressures of an ever-growing human population and increased commercial and industrial activities. The pace of using the natural resources, such as water, forests, fossil fuels, etc., has escalated to an extremely high level due to the rapid growth in urban population. To make room for the growing population, forests are being destroyed. Uncontrollable emissions of anthropogenic carbon dioxide caused by urbanization are the result of uninterrupted burning of fossil fuels for industrial processes, transportation of people and products, and other purposes. The primary producers of greenhouse

²Anjail D. Nanda, India's *Environmental Trump Card: How Reducing Black Carbon through Common but Differentiated Responsibilities Can Curb Climate Change*, 39, DENVER JOURNAL OF INTERNATIONAL LAW & POLICY, 523, 525 (2011)

gases in these urban areas are the numerous motor vehicles and industry.³ In this region, the concept of clear blue sky and unpolluted air is under threat. Assam's five non-attainment cities have been recognized by the National Air Quality Monitoring Programme (NAMP), with Guwahati having pollution levels above the suggested air quality norms.⁴

An emission inventory study has been initiated for Guwahati, in which the contribution of pollutants from various sectors has been quantified. The total emission of black carbon is estimated to have been 19.38 gigagrams (Gg) in 2018–19; of this, 3.38 Gg comes from Guwahati, which is said to be the district with the greatest emissions of black carbon. It's alarming that Guwahati has some of the highest levels of black carbon pollution in the world, according to State Government. In terms of its ability to cause global warming, black carbon ranks second to carbon dioxide in this regard. Black carbon emissions in Guwahati are rising mostly due to increased haphazard industrial and construction activities as well as vehicular emissions. Rising emissions of black carbon is also a result of open burning of solid waste disposal in the city, which most people are unaware of.⁵

Studies have found that on several occasions Guwahati had worse air quality than Delhi, which indicates how serious the problem of air pollution is. Experts have seen a rise in severe lung conditions, acute and chronic bronchitis, and other respiratory issues among city dwellers. Rainfall patterns have also been affected by black carbon emissions, illustrating the link between air pollution, climate change, and prolonged periods of high heat throughout the year.⁶

ENVIRONMENTAL LEGAL FRAMEWORK IN INDIA: A COMPREHENSIVE REVIEW

Air pollution is a major concern that Indian citizens are well aware of. The majority of the time, the pollution level varies between terrible and worse and sometimes conditions become so dire that medical emergencies must be proclaimed. In the case of Consumer Education and Research Centre v. Union of India⁷, the Hon'ble Supreme Court of India examined Article 21 of the Indian

³ Mehzebabeen Sultana, *The Effect Of Urbanization On Environment: With Special Reference To The City Of Guwahati, Assam*, 17(9) ISSN 1567-214X, PALARCH'S JOURNAL OF ARCHAEOLOGY OF EGYPT/EGYPTOLOGY, 228, 229-230 (2020)

⁴THE ECONOMIC TIMES INDIA, AUTO, <https://auto.economictimes.indiatimes.com/>, (last visited Feb. 8, 2024)

⁵ *id*

⁶ Pradyut Bordoloi, *Rising air pollution shows urgent need for localized climate action in the Northeast*, HINDUSTAN TIMES (Feb. 9, 2024, 12:10 AM)

⁷ Consumer Education and Research Centre v. Union of India, (1995) 3 SCC 42

Constitution and noted that the term "life" does not refer to a mere animal existence, but, it covers the rights to a higher standard of life, to live with dignity and also to live in a clean environment. Over time, the State has recognized this problem and taken a number of actions to address it.⁸ Along with Delhi, which is consistently ranked among India's most polluted cities, nowadays Guwahati has also become well known as a polluted city with high levels of black carbon emissions.

Assessing Commitments and Implementations

Along with Environment protection Act 1986⁹ and various Constitutional provisions, in order to battle air pollution, India has passed the Air (Prevention and Control of Pollution) Act, 1981¹⁰, which provides a foundation for the establishment of State and Central Pollution Control Boards. This act addresses the pressing issue of air pollution by requiring the boards to convene every three months or more frequently when required. They are also empowered to declare certain areas as 'air pollution control areas' and possess the authority to enforce emission limits on automobiles, prohibit industrial operations in 'air pollution control areas', monitor industry-specific emissions, and even file court cases to prevent individuals from contributing to air pollution.¹¹ India has formally joined the Climate & Clean Air Coalition (CCAC) and pledged to use its National Clean Air Programme (NCAP) to effectively address air pollution. It is an all-encompassing plan that includes steps to stop, manage, and lessen air pollution as well as enhance national air quality monitoring. By 2026, Centre even seeks to cut particulate matter and fine particulate matter emissions by 40%.

Observing the ghastly impact of Black Carbon, The Ministry of Environment, Forest and Climate Change (MoEFCC) have taken several measures to control black carbon emissions ranging from promoting the use of cleaner household cooking fuels, introducing alternate fuels like CNG, LPG etc., to enhancing the network of metros for public transport in many cities. Assam State Government have also taken pledge to make public transport run entirely on non-fossil fuel and electricity. To contribute to the nation's march towards green energy, Assam Government have made efforts to adopt several nature friendly steps but there is still a gap in its execution, because an uncontrollable urban progression still continues to persist. .

⁸ Debmalya Banerjee, Aman Singh, *India: Air Pollution – A Need To Re-Visit Legislative And Regulatory Framework In India*, MONDAQ, (Feb. 12, 2024, 6:20 AM), <https://www.mondaq.com/>

⁹ Environment protection Act, 1986, No. 29, Acts of Parliament, 1986 (India)

¹⁰ Air (Prevention and Control of Pollution) Act, 1981, No. 14, Acts of Parliament, 1981 (India)

¹¹ *id*

The Judiciary has also demonstrated its excellent jurisprudence in addressing individual's rights to a healthy environment through important rulings in cases such as *MC. Mehta v. Union of India* (1998)¹², *MC. Mehta v. Kamal Nath* (1997)¹³, and the *Oleum gas leakage case* (1987)¹⁴ and many more. According to Justice Bhagwati, anyone can file a case before the Supreme Court to have a fundamental right upheld anytime it is violated¹⁵. Government has focused its legislative and policy-making efforts on addressing the problem of air pollution, but looking at the current degrading situation it can be assumed that there are a lot of unfulfilled expectations regarding its implementation as most people are unaware of Black carbon emissions and its harmful impact, therefore may have failed to understand the significance of the existing policies.

CONCLUSION

It is clear that urbanization has had disastrous effects on Guwahati, as evidenced by the ways in which it has reduced the amount of forest cover to accommodate the city's expanding population, raised Air Quality Index readings, generated uncontrollably large amounts of solid waste, increased the number of cars and industrial activities in the area emitting toxic gases and other pollutants, etc. Even though it has improved the city in many ways, the ecology has suffered as a result.

The enforcement agency appears to have failed miserably to strictly enforce environmental regulations, despite the legislature's repeated promulgation of laws and elaborate directives to ensure preservation of the environment from capitalistic exploitation. Several international environmental treaties have already incorporated the notion of Common but Differentiated Responsibilities, which should be the international community's first line of defence against the effects of black carbon. A multifaceted approach is required to address black carbon emissions in cities, including the adoption of cleaner technologies, improvement of combustion efficiency, waste management practices, and sustainable urban planning to manage the overall pollution levels. Efforts to mitigate black carbon often align with broader strategies for improving air quality and combating climate change. In order for every person to enjoy their fundamental right to live in a healthy environment, cities like Guwahati must strike a balance between urban expansion and environmental sustainability.

¹²MC. Mehta v. Union of India, 1998 A.I.R. 2340

¹³ MC. Mehta v. Kamal Nath, 1997 (1) S.C.C. 388

¹⁴ MC. Mehta v. Union of India, 1987 A.I.R. 1086

¹⁵ Bandhua Mukti Morcha v. Union of India, 1984 A.I.R. 802