Challenges of Air Pollution in Metro Cities in India

Dr. Anjani Kumar Singh
Associate professor, Dept. of Geography
K.S.Saket P.G.College, Ayodhya

Dr. Abhay Kumar Singh
Assocoate Professor, Dept. of Defence & Strategic Studies
K.S.Saket P.G.College, Ayodhya

Abstract

Urban air quality has generally deteriorated throughout the Indian cities. The reasons are rising numbers of motor vehicles, especially poorly maintained vehicles and growing industrialization without any priority for pollution abatement. Indian cities qualify as some of the most polluted cities in the world and heading the list is the national capital, New Delhi. The single most factor responsible for this deterioration of air quality in cities is the exponential increase in petrol and diesel fuelled vehicles. Industries are also responsible for air pollution in India. Most of the industries are located near cities, irrespective of any environmental considerations. Coal based thermal plants have been established for power generation and are responsible for air pollution through gaseous emissions of sulphur di oxide, nitrogen oxide etc. The main aim of the article is to highlight the causes and challenges of air pollution in metro cities in India.

Introduction

Accuracy is a difficult goal in today adulterated era. All things are more or less polluted including water, air, food, soil and climate etc. Due to the increasing growth of world population, modern lifestyle, increasing industrialization and urbanization the quality of natural elements is constantly getting decrease. The process in natural inter-regularity self mechanism has slowed down. India is a home to 17.5% of the world population and the second most populous country with over 1.2 billion people. There are 53 urban agglomerations in India about 43% of the urban population of India in these cities.

Air Pollution is one of the most widespread environmental problems, because it occurs at many scales indoor, local, urban and regional and global.

Regional and global air pollution are especially difficult to control because polluters are often very distant from those damaged by their emission. Indian cities are reeling under multiple problems including environmental issues that they must contend with most pressing of them all is the issue of air pollution. The poor air quality that citizens are forced to breath especially in the heavily polluted cities has a detrimental impact on their health and well being. In terms of overall impact global air pollution is perhaps the greatest single environmental challenge humans will face in the next few hundred years.

Study Area

Population residing in urban areas in India according to 1901 census was 11.4% this count increased to 28.53% according to 2001 census and crossing 30% as per 2011 census standing at 31.16% in 2017 the numbers increased to 34%. There are 53 urban agglomerations in India with a

population of 1 million or more as of 2011 against 35% in 2001. About 43% of the urban population of India lives in these cities. 8 megacities population between 5 lakh to 1crore. Mumbai, Delhi, Bengalore, Chennai, Hyderabad, Ahmedabad, Kolkata and Surat that have over 4 million people.

Hypothesis

1. The process of urbanization and industrialization during last two decades has resulted in increased level of air pollution.
2. Air pollution is a worldwide problem. This requires efforts at the global National and local level.
3. In Indian metropolises air pollution emerges as a formidable problem in winter.
4. The problem of air pollution can be limited by further legal initiative and awareness.

Reason and Sources of Air Pollution

Air pollution does not recognize geographical boundaries. Just as polluted air from rural areas travels into cities too contribute towards rural pollution. Thus it is critical for antipollution efforts to be coordinated across different level. Various reason of air pollution such as- 1-Urbanization and industrialization. 2-Vehicles fumes. 3-Combustion of fossil fuels. 4-Volcanoes and dust storm. 5-Burning of wastage.

Primarily Air Pollutants

The pollutants that are a direct result of the process can be called primary pollutant. Like as- 1. Sulphur-dioxide 2. Carbon-mono-oxide 3. Nitrogen-oxides 4. Particulate matter 5. Volatile organic compounds.

Secondary Pollutants-

Secondary pollutants are the ones that are caused by intermingling and reaction of primary pollutants. The source of air pollution are multiple vehicular emission, crop burning, generation of dust, particularly from construction sites, depleting tree covers and poor waste management.

Common Type of Particulate Matter-

Aerosols	Any tiny solid or liquid particle
Dusts	Solid particles from grinding
Fumes	Solid particles occurring when vapour condense
Mist, fog	Liquid particles
Smoke, soot, ash	Solid particles mostly carbon from combusting
Smog	Any air pollutant

Cities with the highest small particulate measurement in the world

City	Pm 2.5(μg/m3)
Kanpur	173
Faridabad	172
Varanasi	151
Gaya	149
Patna	144
Delhi	143
Lucknow	138
Agra	131
Muzaffarpur	120

All contribute towards the declining air quality. One of the problems with tackling air pollution solely at the city level is that several factors which contribute towards. Increasing pollution levels have their origins in the bordering sub-urban areas. Pm2.5 pollutant trends.

Based on the Material Available From Source

Nature of air pollution emission sources for Delhi to ambient pm2.5 pollution the contribution of-

1.Vehicle exhaust in up to	30%
2.Biomass burning is up to	20%
3.Soil and road dust up to	20%
4.Industries up to	15%
5.Disel generators is up to	10%
6.Power plant is up to	5%
7.Out side the urban airshed up to	30%

Particulate

Particulates are any particles of dispersed matter, solid or liquid that are larger than individual molecules. The category is very complex because particulate matter varies widely in composition and size. Soot which arises from incomplete fuel combustion in cars and especially coal burning factories is generally the most common particulate in urban areas. It comprises at least 50% of the particulate air pollution in most cities of the world. Particulate matter for a long time can lead to respiratory and cardiovascular diseases such as asthma, bronchitis, COPD, lung cancer and heart attack.

Sulphur-oxides-Sulphur-dioxide emitted from the combustion of fossil fuels like coal, petroleum and other factory combustible are one the major cause of air pollution. In terms of overall damage to humans and the environment SO_2 may be most serious local and regional air pollutant. SO_2 is a gas that is toxic to living things. Plants are especially sensitive, exhibiting stunted growth discoloration and reduce crop field. SO_2 is also the main cause of acid rain.

Nitrogen-dioxide And Volatile Organic Compounds- Nitrogen-oxides and volatile organic compound are major causes of smog and other photochemical pollutants in urban areas. NO and NO_2 Create a variety of problems. Its direct effects on humans and animals including irritation of eyes, living and other mucous membranes. Plant many suffer stunted growth and death. NO and NO_2 largely produced by fuel combustion.

Carbon-mono-oxide- Carbon-mono-oxide (CO) is a deadly gas in high concentration. CO has little effect on plants or materials but in human and animals it interferes with the ability of the red blood cells to carry oxygen to the organ. CO is produced by incomplete combustion, when fossil fuel, wood, tobacco and other organic materials burn under less than ideal condition as a result the carbon is not fully oxidized to CO_2.

Carbon-dioxide- India was the third largest emitter of carbon-dioxide in 2017 of 6.82% share of CO_2 emission about 65% of India's CO_2 emissions in 2009 was form heating domestic used and power sector and about 9% of Indian emission were from transportation (cars, trains, two wheelers, aeroplanes and others) Indias coal fired, oil fired and natural gas fired, thermal power plants are inefficient and after significant potential for CO_2 emission.

Impact on Human Health-

Many different air pollutants can impact on human health –nitrogen oxide, carbon monoxide and ozone among them. But the data base classifies air pollution is two ways; by PM2.5 particles smaller than 2.5 microns in diameters and PM10 particles that are 10 microns in diameter. According

to WHO report air pollution in 2012 caused the death of around 7 million people world wide. Air pollution contribute to the premature death of 2 million Indians every years. Asthma is the leading health problem faced by Indian not surprisingly it accounts for more than 50 percent of the health problems caused by air pollution.

Control of air pollution-

United Nations projected that by 2050 about 64% of the developing world and 86% the developed world will be urbanized. That is equivalent to approximately 3 billion urbanized by 2050. Air pollution control requires the government of India, state government & the common people to work together.

For anti pollution efforts to be coordinated across different levels. Urban-rural and inter state responses are integral to crafting successful solution.

Instituting strong emission standards for industries and introducing stronger vehicular emission standards also need to be effectively implemented .Encouraged the electronic vehicle. Certain policies and programmes focus specifically on cities steps like as –up gradation BS fuel, add- even rationing etc. Municipal Corporation prepare an scientific annual environmental status report

References-

1. An Environmental Pollution Study of India Metropolitan Cities –A.N.Garg & A.L. Aggarwal; journal of Radioanalytical and Nuclear Chemestery,vol 192,no-2(1995) 307-320
2. Environmental science- Michael.L...McKinney& Robert M. Schoch, pub-Minneapolis, st. Povel. West publication
3. Indian Central Pollution Control Board. Report 2016,2017
4. World Health Organisation Report. 2017.
5. Buchman Francis: Journal of Francis Buchanan Kept during the survey of the District of Shahabad in 1812-1813, PP-7
6. Smailes, A.E. (1966): "Indian CityStructure", in R.T. Singh (ed.), Urban Geography in Developing Countries, N.G.S.I. Varanasi, PP-50-51.
7. Taylor Griffith (1951) "Urban Geography", Methuern London.
8. Central Pollution Control Board. 2009, Status of Water Supply, Waste Water Ceneration and Treatment in Class I Cities and Class II Towns of India. Ministry of Environment and Forests. Government of India, New Delhi.
9. Choudhary, B.K. 2012, Non-formal Water-mining in urban Sprawl: A Case of Susuwahi, Varanasi Urban India 32, (I): pp- 53-68.
10. City Development Plan for Varanasi, 2006, Feedback Ventures.
11. Gleick, P.H. 1996, Basic Water Requirements for Human Activities: Meeting Basic Needs Water International 21: pp. 83-92.
12. Jha, Nitish. 2010 Access of the Poor to Water Supply and Sanitation in India: Salient Concepts, Issues and Cases. Working Paper, 2010, Available online on www.ipc.undp.org Accessed on 27th Aug. 2013.
13. Lahiri-Dutt, Kuntala, 2008 The Quest for Water: REthinking Water Serenity, Developent 51: pp. 5-11, Available on www.sidint.org/development, Accessed on 25th September, 2011.
14. Mathur, M.P. 2007 Norms and Standards of Urban Infrastructure and Services in India, National Institute of Urban Affairs, New Delhi, Working Paper. Available on www.niua.org/publications working paper. pdf.
15. Sarala Devi, I, 2012 People's Attitude towards Paying for Water. Available on www.indiaensiron-mentportal.org.in Accessed on 18th July, 2012