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# Review on the Major Pollution causes Element of the Atmospheric Air in India

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**Abstract:** India is a developing country, so the development of the every sector is accrue day by day . In the world the India is second largest country in population. So the requirements and developments are accure . Starting of the 21 century the human life is developing very rapidly.

Comfortness of people is increasing. With all these things the air pollution increases rapidly from last 10 year. In this reaserch , find the Majour pollution element in the atmospheic air in india. This study is help to find the major resources of the pollution element.

**Keywords:** Air pollution, pollution in India, element of pollution, major elements, Air pollution causes.

## I. INTRODUCTION

Air pollution is one of the greatest threats in the world right now , and in a country like India with a population of almost a 130 million (17%of world's population), it is already getting difficult to breathe in most of the metropolitan cities. In india , major cities air are very polluted . Air pollution accrues due to many pollutants. Every pollutants generation are from different sources.

India is a developing country so the development of any part or construction are continuing the day by day. So the dust pollution is increase in this area . Also the factory and factory sheds are developing day by day . This type of pollution are occur near the metro cities and urban area . Due to the vehicle exhaust the metro cities are highly polluted. In villages the pollution increases due to the burning of garbage and domestic cooking method. These types of pollutants are effect to the human health. Rural and urban India are both affected by poor air quality. There is, however, heterogeneity in sources and pollutant profiles. For instance, use of cooking fuels varies between urban and rural households, vehicular density is vastly different in cities and villages, and differing climatology and geography across India affects regional and seasonal levels of ambient air pollution.

## II. LITERATURE REVIEW

1) Paper No : 1

a) Title: Air pollution and health in india.

b) Author: Public Health Foundation of India & Centre for Environmental health

c) Published Year: 2017

d) Outcomes: In this paper, the detailed data and study on the different types of pollution and its level in different areas of india. Discuss about the pollution causes and its effects on human health. Detailed data about the pollution types and pollution causes types and their sources.

2) Paper No : 2

a) Title: Air Pollution in India Impact, policy analysis and remedial measures by governments

b) Author: swaniti initiative

c) Published Year: not mention

d) Outcomes: Air Pollution is a complicated issue and negatively impacts the health of citizens as well as the economy of the country. Both indoor and outdoor air pollution have emerged as one of the leading causes of deaths in India and while recent reports highlight the worsening outdoor air pollution in urban centres, indoor air pollution due to biomass burning and inefficient 'chulhas' is also an area of concern. The Government of India and the state governments have recognized the adverse effect of air pollution and there is increased seriousness about addressing the air quality issue among all the stakeholders.

3) *Paper No : 3*

- a) *Title:* THE CAUSES AND CONSEQUENCES OF PARTICULATE AIR POLLUTION IN URBAN INDIA:A Synthesis of the Science.
- b) *Author:* Milind Kandlikar, Gurumurthy Ramachandran
- c) *Published Year:* Access on 2021
- d) *Outcomes:* In this paper the theoretical study on the causes of the particulate matter in the pollution and also on the human health. Study about the particulate matter , it resources and their effects .

4) *Paper No : 4*

- a) *Title:* Air Pollution and India: Current Scenario
- b) *Author:* Debosree Ghosh, Pratap Parida.
- c) *Published Year:* 2015
- d) *Outcomes:* Government of India has already taken several measures to prevent and control air pollution in the country. Further, the government needs to enact laws for prevention of this increasing air pollution and emission standard of air pollutants. Already more than 15 years old vehicles have been banned from running on the roads of Delhi by Government(<http://urbanemissions.blogspot.in/2014/01/delhi-ranks-1st-among-world-cities-with.html>). Steps have also been taken for reducing vehicles using diesel as fuel on roads of Delhi.

5) *Paper No : 5*

- a) *Title:* Air pollution health research priorities for India: Perspectives of the Indo-U.S. Communities of Researchers
- b) *Author:* Terry Gordona, Kalpana Balakrishnanb, Sagnik Deyc, Sanjay Rajagopaland, Jonathan Thornburge,George Thurstona, Anurag Agrawalf, Gwen Collmang, Randeep Guleriah, Sneha Limayei,Sundeep Salvii, Vasu Kilaruj, Srikanth Nadadurg.
- c) *Published Year :* 2018
- d) *Outcomes:* In this paper The goals of the two-year bi-lateral dialog between researchers in India and the U.S. provided a fruitful exchange of information and mutual understanding that resulted in taking stock of the state of re-search of air pollution health research in India. These interactions re-sulted in identifying the research gaps, needs and potential opportu-nities for sharing of expertise, technology, and experience from the U.S.Through these interactions over the two years by a small group of scientists, a set of charge questions was developed for a focused dis-cussion by a larger community of scientists that worked in isolation at the two-day workshop held in New Delhi, India.

6) *Paper No : 6*

- a) *Title:* Clearing the Air: Highlighting Actions to Reduce Air Pollution in India
- b) *Author:* Indian institute of public health Gandhinagar.
- c) *Published Year:* 2019
- d) *Outcomes:* In this paper, the study of the pollution in different cities of India and find the way to clear the air in these cities. This study on pollution in Delhi, Ahmedabad, Nagpur, Raipur, Pune, Bangalore, Chennai .

7) *Paper No : 7*

- a) *Title:* Health Effects of Air Pollution among Residents of Delhi: A Systematic Review
- b) *Author:* Palak Balyan, Chirashree Ghosh, Arun Kumar Sharma, B.D. Banerjee
- c) *Published Year:* 2018
- d) *Outcomes:* Exposure assessment and epidemiologic studies in the developing world are most important as informative database for the recent global health understanding. Despite inconsistencies, findings from Delhi based studies strongly indicate that air pollution is a major public health problem affecting health of people in an adverse manner. The air quality remained poor and kept on deteriorating in last two decades. The effect of poor air quality manifested as various health effects in the form of respiratory dysfunctions, cardiac disorders and their increased risk. The adverse health effects showed most consistent relationship with suspended particulate matter (SPM). Many of the existing epidemiologic investigations conducted in Delhi regions suffer from inaccurate exposure assessment, insufficient data and long term follow up of cohort studies. Therefore, cohort studies with larger sample size are needed to investigate the influence of air pollution on morbidity and mortality, for advocating policies and guidelines for, monitoring and control of harmful effects of air pollution.

### III. AIR POLLUTION SCENARIO IN INDIA

It is shocking to know that out of the top twenty most polluted cities in the world, thirteen are in India (<https://agenda.weforum.org/2015/06/which-is-most-polluted-city/>). Allahabad, Agra, Lucknow, Kanpur, Amritsar etc. are among the list of top 20 most polluted cities in the world (<https://agenda.weforum.org/2015/06/which-the-worlds-most-polluted-city/>). Other major cities of neighboring countries of India i.e. Karachi, Rawalpindi and Peshawar in Pakistan, Beijing in China are also in the list (<https://agenda.weforum.org/2015/06/which-most-polluted-city/>). Pollution is a real threat to health and well being of mankind. Studies by WHO reveal that globally seven million people died because of exposure of air pollution. Those include death due to exposure to toxic pollutants both inside house and in the environment (<http://gov/health/topics/agents/air-pollution/>). The capital city of India, New Delhi has been recognized as the most polluted city in the world. World Health Organization (WHO) has reported this as per their findings in 2014. It is a alarming situation for the india for next generation. Air pollution effect on a human respiratory system directly.

### IV. AIR POLLUTION CAUSES IN INDIA

Air pollution causes are depend on the particular area and particular source. The major sources of air pollution in India and around the globe are automobile exhaust and industrial emissions (<http://www.niehs.nih.gov/health/topics/agents/air>) The prime air pollutants have been broadly classified as outdoor and indoor pollutants (Fig.1).

#### OUTDOOR POLLUTION

- 1 Carbon partical
- 2 Burning of fossil fuels.
- 3 Mattalic particals from Industries.

#### INDOOR POLLUTION

- 1 Toxic gases from kitchen fuels.
- 2 Smoke

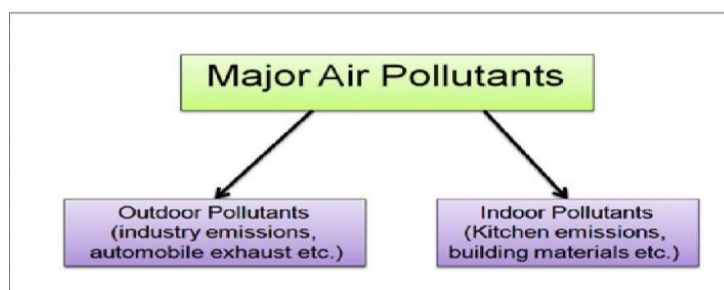


Fig : 1 Major Air Pollutants.

In recent years, air pollution has acquired critical dimensions and the air quality in most Indian cities that monitor outdoor air pollution fail to meet WHO guidelines for safe levels. The levels of PM<sub>2.5</sub> and PM<sub>10</sub> (Air-borne particles smaller than 2.5 micrometers in diameter and 10 micrometers in diameter) as well as concentration of dangerous carcinogenic substances such as Sulphur Dioxide (SO<sub>2</sub>) and Nitrogen Dioxide (NO<sub>2</sub>) have reached alarming proportions in most Indian cities, putting people at additional risk of respiratory diseases and other health problems. Furthermore, the issue of indoor air pollution has put women and children at high risk.

### V. DIFFERENT MAJOR POLLUTANTS IN INDIA.

Major pollutants elements are divided in two part of pollution.

#### A. Pollutants Element From Outdoor Air Pollution

- 1) Hydrocarbons (HC) & Unburned Carbon particles: In open environment HC emission is accrued due to the partially combustion of fuels and gases and garbage. Hydrocarbons emission are very high due to un proper combustion of the fuel in vehicles. Unburned carbon particles release from the exhaust system of the vehicle. There are Number of operating vehicles India FY 1951-2017. In a country with the third largest road network in the world, the total number of vehicles in fiscal year 2017 stood at 253 million( <https://www.statista.com/statistics/664729/total-number-of-vehicles-india/#:~:text=Number%20of%20operating%20vehicles%20India%20FY%201951%2D2017&text=In%20a%20country%20with%20the,2017%20stood%20at%20253%20million.>).The 51% of pollution is caused by the industrial pollution, 27 % by vehicles, 17% by crop burning and 5% by fireworks.



- 2) **Dust Particals:** In India construction of the building are a day by day in urban area. Dust & Construction contribute about 69% to the air pollution in India, which is followed by Waste Burning. Dust & Construction activities are mostly in the urban areas while Waste Burning is in the rural areas (agriculture).
- 3) **Mattalic Particles:** Mattalic particles are the pollutants release from the industries. In india this type pollution is 20% to 25% of total pollution of air.
- 4) **Soot Particles:** Soot particles are Produced from the burning of wood and waste materials. And also in a Cotton industries, the soot particals are released. Sources of air pollution in India pie-chart shown in fig. (2)

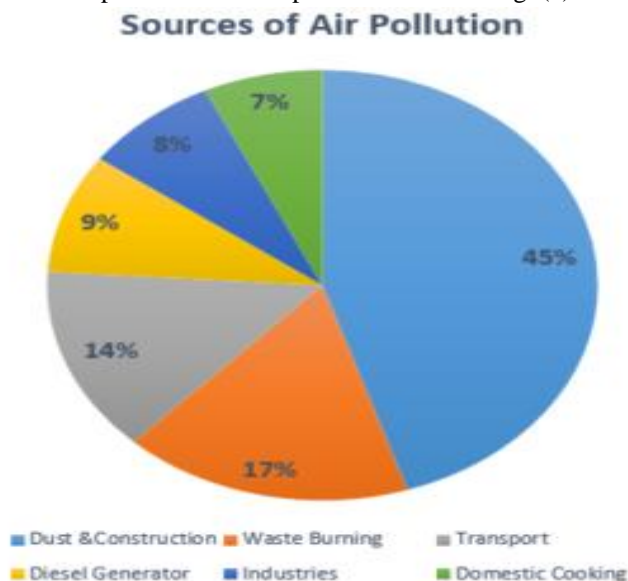


Fig: 2 sources of air Pollution.

**B. Pollutants Element From Indoor Air Pollution**

- 1) **Volatile Organic Compounds (Voc):** Voc are the compounds which release from the home furniture, ceramics which are use in house . Voc are the major element for the indoor air pollution. Voc are the contribute the 21% of the indoor air pollution. Vocs are very harmful for breathing. Ex. At any home where proper ventilation system are not provided , voc are more in this type of home.
- 2) **Gases From Kitchen Fuels:** Gases from the kitchen fuels are the second major element for the indoor air pollution. This gases are release from the usage of kitchen while cooking . In summer because of heat the gases are more release from the fuels. In indoor air pollution gases from kitchen fuels contribute 16% of total indoor air pollution.
- 3) **Smoke Particles from Domestic Cooking:** This is a part of air pollution in India. Because of lack of the supply against the demand of energy, in india 800 million people are depend on the solid biomass, or waste for the cooking purpose. So the smoke particles from these, are a part of indoor & outdoor both pollution. (Sources of indoor air pollutants shown in fig : 3)

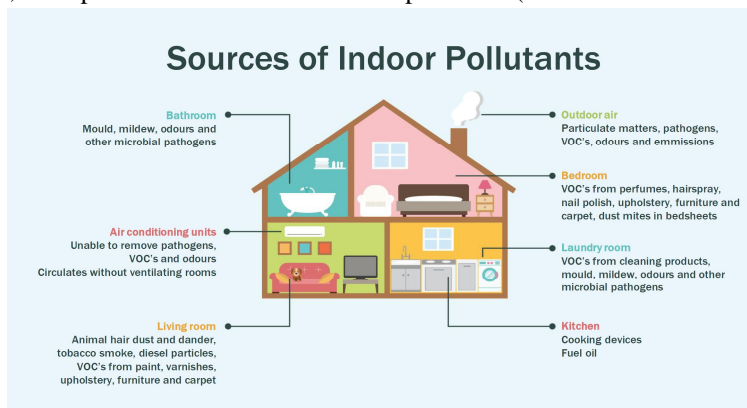


Fig : 3 Sources of indoor pollutants.

### C. Observation

There are various pollutants which are present in air in India. Observing that the air pollution is mainly due to the major pollutants like HC Particles, dust particles, etc. In India the air pollution is higher in metro cities. And on the other hand, in rural areas the air pollution is accurate due to the burning of waste, wood etc. Mainly the air pollution is divided into two parts: indoor and outdoor air pollution. Observing all the pollutants, there are mainly two major pollutants. First in outdoor air pollution the dust particles from the construction site are present at a very high level in the air. Dust particles are present at a low height from the ground, so this directly affects human health. And also the breathing problem is increasing due to the presence of dust particles at ground level. Second in indoor air pollution, domestic cooking and VOCs are the main pollutants. In India, domestic cooking is widely used in rural areas. And on the other hand, in cities, indoor air pollution increases in high-rise buildings. Mainly the indoor air pollution increases because of improper ventilation provided in homes or buildings.

### D. Discussion

Observing the major pollutants for air pollution, there are two major pollutants for air pollution in India. Domestic cooking and VOCs and dust particles are the main pollutants for air pollution in India.

## VI. CONCLUSIONS

After reviewing all the theoretical reasons and practical studies, the major air pollution causes element of the atmospheric air in India is dust particles and domestic cooking (solid biomass, wood, plastic waste, burning for cooking). And VOCs in the building because of the lack of ventilation. These are the major elements for atmospheric air pollution in India. To see the list of contributors, please refer to the top of file IEEETran.cls in the IEEE LaTeX distribution.

## REFERENCES

- [1] Debosree Ghosh, Pratap Parida., Air Pollution and India: Current Scenario. International Journal of Current Research, Vol. 7, Issue, 11, pp. 22194-22196, November, 2015
- [2] Air Pollution in India Impact, policy analysis and remedial measures by governments., [www.swaniti.in](http://www.swaniti.in)
- [3] Milind Kandlikar, Gurumurthy Ramachandran., THE CAUSES AND CONSEQUENCES OF PARTICULATE AIR POLLUTION IN URBAN INDIA: A Synthesis of the Science. Annu. Rev. Energy Environ. 2000
- [4] Debashish Bandyopadhyay, Debosree Ghosh, Aindrila Chattopadhyay. Lead Induced Oxidative Stress Mediated Myocardial Injury: A Review. Int. J. Pharm. Sci. Rev. Res., 29(2), November – December 2014; Article No. 13, Pages: 67-71.  
Debosree Ghosh, Pratap Parida. Lead Poisoning and California Condor. Journal of New Science Biotechnology, 1(1): 7-9. 2015.  
<http://time.com/3608534/india-new-delhi-worlds-most-polluted-city/>  
<http://timesofindia.indiatimes.com/city/nagpur/Traffic-cops-falling-prey-to-lung-diseases/articleshow/47620826.cms>  
<http://urbanemissions.blogspot.in/2014/01/delhi-ranks-1st-among-world-cities-with.html>  
<http://www.cseindia.org/content/workshop-global-burden-disease-air-pollution-amongst-top-killers-india>  
<http://www.ibtimes.co.uk/world-environment-day-10-most-polluted-cities-world-1504260>  
<http://www.medicinenet.com/script/main/art.asp?articlekey=105529>  
<http://www.niehs.nih.gov/health/topics/agents/air-pollution/>  
<http://www.theguardian.com/news/datablog/2015/jun/24/air-pollution-delhi-is-dirty-but-how-do-other-cities-fare>  
<https://agenda.weforum.org/2015/06/which-is-the-worlds-most-polluted-city/>  
[https://en.m.wikipedia.org/wiki/Air\\_pollution\\_in\\_India](https://en.m.wikipedia.org/wiki/Air_pollution_in_India)
- [5] Regan, Helen. "21 of the world's 30 cities with the worst air pollution are in India". CNN. Retrieved 2020-02-26.
- [6] FIG for indoor air pollution resources. <https://www.andatechdistribution.com.au/a/s/blogs/news/indoor-air-quality-infographic>
- [7] Health Effects of Air Pollution among Residents of Delhi: A Systematic Review..., 2018.,
- [8] Palak Balyan, Chirashree Ghosh, Arun Kumar Sharma, B.D. Banerjee Clearing the Air: Highlighting Actions to Reduce Air Pollution in India., 2019, Indian institute of public health Gandhinagar.
- [9] Terry Gordona, Kalpana Balakrishnanb, Sagnik Deyc, Sanjay Rajagopaland, Jonathan Thornburge, George Thurstona, Anurag Agrawalf, Gwen Collmang, Randeep Guleriah, Sneha Limayei, Sundeep Salvii, Vasu Kilaruj, Srikanth Nadadurg., 2018., Air pollution health research priorities for India: Perspectives of the Indo-U.S. Communities of Researchers
- [10] Commissioner C, Road M. Census of India 2011 Provisional Population Totals - India -Data Sheet Child Sex Ratio in Census of India 2011 Provisional Population Totals -India - Data Sheet. Minist Home Aff India. 2011;1-60.
- [11] India State-Level Disease Burden Initiative Air Pollution Collaborators. The impact of air pollution on deaths, disease burden, and life expectancy across the states of India: the Global Burden of Disease Study 2017. Lancet Planetary Health. 6 December 2018. [http://www.thelancet.com/journals/lanplh/article/PIIS2542-5196\(18\)30261-4/fulltext](http://www.thelancet.com/journals/lanplh/article/PIIS2542-5196(18)30261-4/fulltext) (accessed 05 February 2019)
- [12] Alam M, Sathaye J, Barnes D. 1994. Urban household energy use in India: efficiency and policy implications. Energy Policy 26(11): 885-91



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