Impact of Covid 19 on Environment in Patna

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ABSTRACT

In December 2019, an uncommon respiratory disorder was noticed in the Wuhan City, China, with a link to Wuhan food market, selling poultry and various wild live animals to the general public. This event was reported to the World Health Organization (WHO). The agent causing the infectious disease has been identified as a unique coronavirus named as COVID-19. The virus has spread all over the planet in a short span of time. WHO declared this infectious disease outbreak as a pandemic. The COVID-19 pandemic has wedged human life, and therefore the world economy. Several countries implemented lockdown to contain the spread of the virus. This lockdown has brought a halt in production processes and various other activities that contribute to air pollution. This has resulted in improved air quality as well as improvement in other environmental parameters like water quality. This paper is trying to provide an insight into the impact of COVID-19 on the environment in India.

Keywords- *COVID-19, Environment, Air Pollution*

INTRODUCTION

Coronavirus is a common virus that causes nose, sinuses, or upper throat infections. Most of the coronavirus are not quite dangerous (Web Med, 2020). After the COVID-19 outbreak in China in December 2019, the World Health Organization identified SARS-CoV-2 as a new type of coronavirus. The virus quickly got spread around the world. COVID-19 can trigger what doctors call a respiratory tract infection. It can affect your upper respiratory tract (sinuses, nose, and throat) or lower respiratory tract (windpipe and lungs). It spreads in the same way as other coronavirus do, mainly from person-to-person through small droplets from the nose or mouth which are spread when a person with COVID-19 coughs or exhales. These droplets may land on objects and surfaces and from there, can infect people coming in contact. Infections range from mild to lethal. SARS-CoV-2 is one of the seven types of coronavirus including the ones that cause severe diseases like Middle East respiratory syndrome (MERS) and sudden acute respiratory syndrome (SARS). The other coronavirus cause most of the colds that affect us generally but aren't a serious threat for otherwise healthy people.

The first case of COVID-19 in India was reported on 30th January 2020. India currently has the largest number of confirmed cases in Asia, and has the third highest number of confirmed cases in the world after the United States and Brazil. To control the spread of coronavirus, the government of India announced first nationwide lockdown for 21 days on 24th March and subsequently, this lockdown was extended till 31st May. The process of unlock started from 1st June and is being carried out in the phase wise manner. The lockdown implemented in Bihar, has been extended till 6th September due to increasing cases of COVID-19. This world's biggest lockdown brought a halt in the production processes across the country. Although this lockdown has caused inconveniences to people**,** it has impacted the environment very positively. In Bihar, all major industries are located on the banks of river Ganga. As the production processes were at halt due to the lockdown, the river got rid of the toxic waste and effluents for some time; thus, improving the quality of water in the river. Due to the closure of industries, generation of waste got reduced substantially. The public transport services were also limited to essential services only. This resulted in a sharp drop in the emission of greenhouse gases and toxic particulate matter in the environment. Because of the lesser demand of power in industries, use of fossil fuel was considerably got reduced. Ecosystem improved tremendously. The COVID-19 pandemic displayed a contrasting consequence. On the one hand it caused a panic situation worldwide, and on the other hand it impacted environment positively.

Discussion

India has witnessed a speedy industrial growth during past two decades. Alongside we paid very heavy cost for this growth in terms of continuous degradation of the air quality and other ecological resources too. According to World Health Organization (WHO), around 7 million people die every year from exposure to fine particles in the polluted air.[1] Adverse health impacts of air pollution include irritation of eyes, nose and throat. It also affects respiratory system causing irritation, inflammation and infections, asthma and reduced lung function. It causes headache and anxiety, cardiovascular diseases, impacts liver, spleen etc. WHO data shows that every 9 out of the 10 people across the world breathe high level of pollutants.[2] Exposure to polluted air, water and soil has caused more than nine million premature deaths in 2015. These deaths were caused due to cancer, lung diseases, heart diseases etc. and were linked to air pollution. (Brink, 2017).

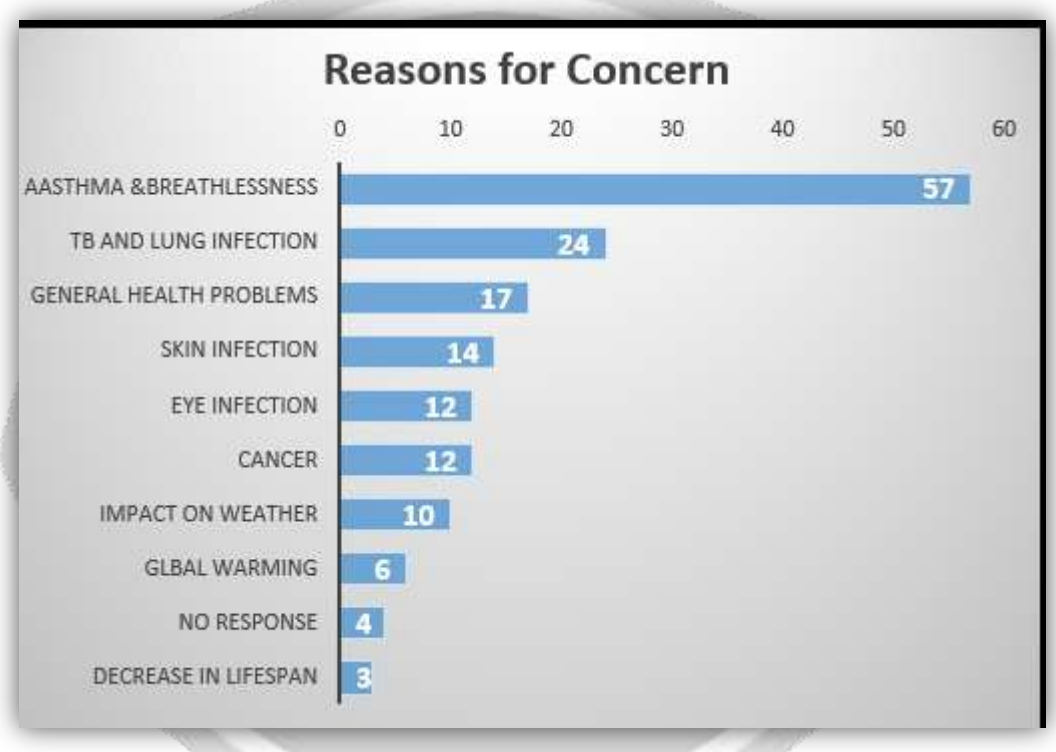


Figure- 1. Health impact of Air Pollution in India[3]

The concentration of various pollutants like Particulate Matter (PM_{10} , $PM_{2.5}$), Nitrogen Oxides (NO_x), Sulphur Dioxide (SO_2), Black Carbon (BC), Ozone (O_3), Ammonia (NH_3) and Lead (Pb) are the various pollutants causing health problems. National Air Quality Index (AQI) transformed complex air quality data into a single number (index value), nomenclature and colour. There are six AQI categories, namely Good, Satisfactory, Moderately Polluted, Poor, Very Poor and Severe. Each of the categories has been decided on ambient concentration values of pollutants and their likely impacts on health.

[1] https://www.who.int/news-room/detail/02-05-2018-9-out-of-10-people-worldwide-breathe-polluted-air-but-more-countries-are-taking-action

[2] https://www.who.int/health-topics/air-pollution#tab=tab_1

3 https://timesofindia.indiatimes.com/india/delhis-air-pollution-menace-some-findings/articleshow/57343912.cms

Numerical value	Air Quality Index levels of health concern
0 to 50	Good
51 to 100	Moderate
101 to 150	Unhealthy for sensitive groups
151 to 200	Unhealthy
201 to 300	Very Unhealthy
301 to 500	Hazardous

Figure-2 – Air Quality Index (Shaikh, 2019)

The environment of India has been degraded with time and all the Pollutant Levels and Air Quality Index limits have been left way behind. Due to the increasing rate of COVID-19 cases in India and subsequent looming crisis, the government declared a complete lockdown for 21 days on March 24th, 2020 which was further extended for 19 days on April 14th, 2020 (II phase) followed by 14 days till 17th May (III phase) and more 14 days (Phase IV). Various restrictions were imposed by the government which restricted activities like vehicular movement, industrial production, tourism and other activities. This lockdown has given time to the nature to heal itself with reduced human interference in natural environment. The impact can be observed as air quality improved, water became less contaminated in water bodies and adequate amount of rainfall was recorded.

Pollution in Patna

Increasing air pollution in Patna is a threat to people. It is not only causing respiratory problems among its citizen but also causing various other health related issues like cardiac problems resulting into an increase in the mortality among heart patients. The major sources of air pollution in Patna are anthropogenic factors (Bihar State Pollution Control Board, 2019).
Some of these are:-
1) Particulate Matter- It has been identified as the main source of air pollution of Patna
- This is mainly due to re-suspension of road dust
- Construction activities
- Emission from vehicles , Diesel Generator sets
- Burning of solid waste and solid waste and fossil fuel
- Transportation of construction material like soil, sand etc.

2) Nitrogen Dioxide (NO_2) - NO_2 also has increased to an alarming level
- This increase is mainly due to photochemical reaction in atmosphere and vehicular emission.
- Old Vehicles and traffic congestion

3) Neighboring States' Pollutants
- Bihar is flanked by states like Uttar Pradesh and Bengal which significantly contribute in air pollution. The pollution of these two big states also affects air quality of Bihar.

- Bihar gets major air pollutants like SO_2 and NO_2 from industrialized city like Kanpur and Kolkata through easterly wind and westerly wind.

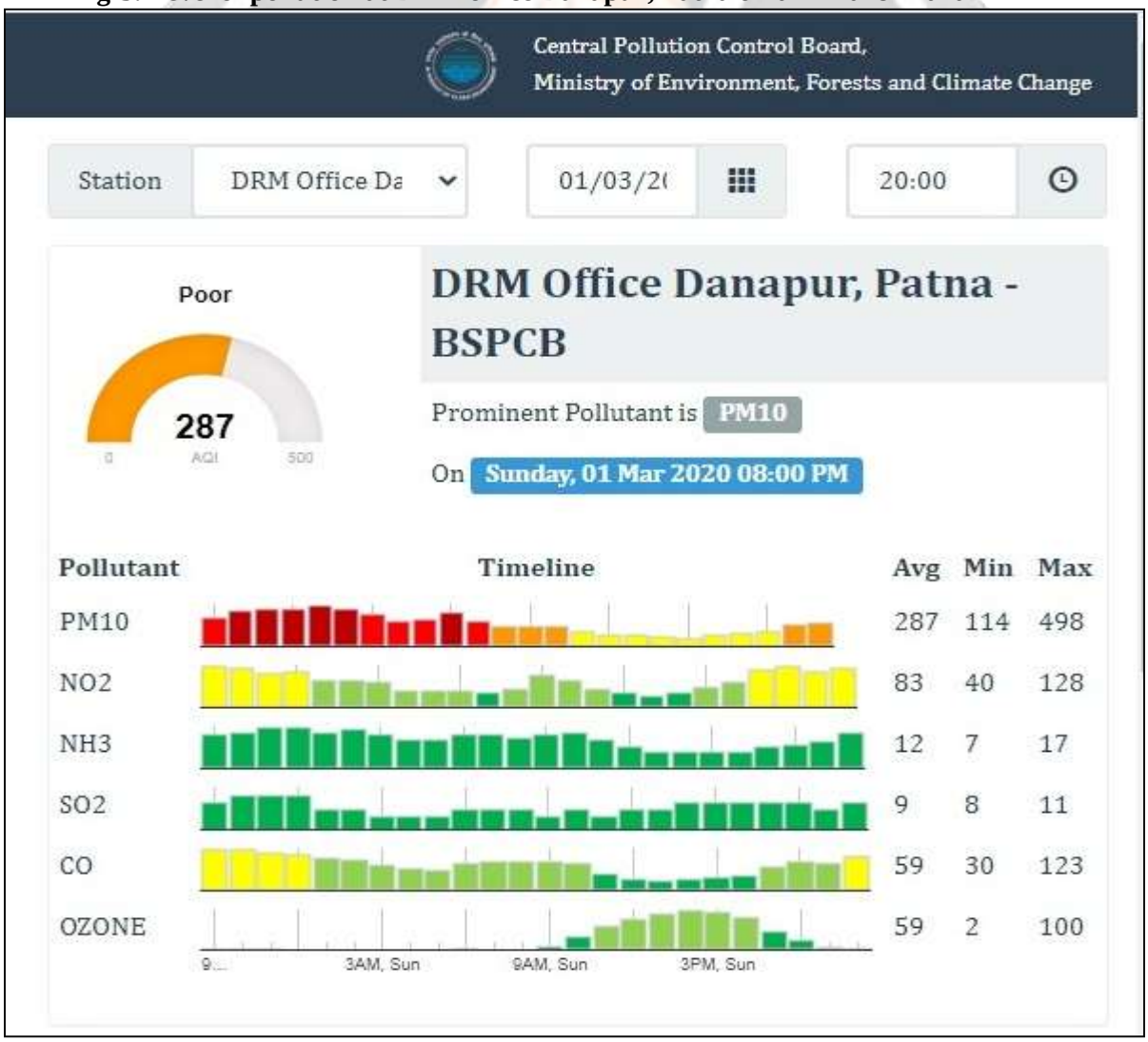
4) Geological Formation

- Majority of soil in Bihar is alluvial in nature, Patna is sitting on very light soil (Balsundri). The geological structure is prone to dust formation and that is the basic reason behind high level of PM 2.5 and 10 in the city.

The level of Pollution before and after lockdown in Patna

COVID-19 lockdowns cleaned up the air across the state of Bihar, as plethora of economic activities were brought to a standstill. The impact of lockdown was reflected in the improvement in quality of air, decrease in the levels of NO_2, PM 2.5 and reduction in the levels of other air pollutants. Vehicular and industrial restrictions along with strong winds and frequent rains helped in keeping pollution level low in the capital city of Bihar. The overall Air quality Index has also got improved during this period. We have compared the levels of pollution in Patna by taking Real Time Data of Air from Central Pollution Control Board for 01st March 2020, which is just before the onset of lockdown and 01st August 2020, when the process of unlock was started yet there were limited industrial and construction activities. The location for comparison was taken at DRM Office Danapur, Patna-BSPCB.

Fig-3. Level of pollution at DRM office Danapur, Patna on 01st March 2020



Source- Central Pollution Control Board, GoI

Fig-4. Level of pollution at DRM office Danapur, Patna on 01st August 2020

Source- Central Pollution Control Board, GoI

The difference in air quality is clearly visible from the two figures. Figure-3 shows data of Air Quality Index of pre lockdown period i.e for 01st March. The AQI was 287 which comes in the poor AQI category. The various pollutants like PM 10, NO_2, NH_3, SO_2, CO and Ozone quantity is much higher compared to CPCB data for 01st August which is depicted in figure-4. Though in the month of August the government allowed various activities, and the process of unlock is in progress, still AQI is at 42, which is much better compared to 01st March. Sharp reduction in the levels of various pollutants can also be been on two figures.

Conclusion

The lockdown imposed to contain the spread of COVID-19 has given a rare opportunity to assess human impacts on the environment. During this period we witnessed visible changes in the environment. Reduction in various types of emissions like CO, CO_2, SO_2 and oxides of nitrogen (NO_X), made the city livable. People during this period experienced an elevated environmental revival due to cleaner air, cleaner rivers and water bodies, and beautiful birds roaming around human habitats. Animals and birds are enjoying noise free environment. Streets are crowd-free and hence, less littered. It seems Mother Nature is trying to bounce back. But post-COVID-19 period would bring the velocity of human dominancy causing environmental pollution again. We must keep in mind that pollution itself is killing millions of people across the world and thus keeping our environment clean and healthy is desirable.

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