Positive Effects of COVID-19 Pandemic on Environment

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ABSTRACT

Under the agony of this recent pandemic going on, in the world due to Covid-19; there has been loss of millions of human lives along with huge economical shock and great recession through out the globe. Environmental degradation has been one of the biggest threats of this century. In spite of all the steps taken by environmentalists and government for the healing of environment in past few years, we couldn’t reach upto the mark. But during the lockdown, which was forced as a precautionary measure for Covid-19 pandemic, environment has successfully recovered to a large extent which was otherwise not possible. This has definitely brought a positive change in climate globally. This review article deals with various such positive impacts of lockdown on ecosystem. Covid-19 outbreak has restricted the social freedom of people globally. It has caused both positive and negative effects on environment. Reduction in greenhouse gas emission because of reduced transport facilities and industrial and other activities were some of positive effects of lockdown while negative effects on mental health of people and increased medical waste during the lockdown were some of the negative effects of lockdown. In this study, the relationship between Covid-19 outbreak and effects on environment was discussed in worldwide sense and a detailed review was conducted that could be used for further planning of researches on the same subject.

INTRODUCTION

COVID-19 has impacted people globally. Around 213 countries have been impacted by it, and the disease has spread among millions of people, causing deaths of around 130,000, with the numbers still increasing.

At present, mostly all nations are taking steps to fight against it’s spread with measures like screening tests and practising social distancing. These practices are indirectly affecting the environment, which has been analysed by various studies. According to these studies, a positive indirect effect has been estimated on the environment.

Coronavirus could have triggered the biggest fall in carbon emission since World war II (Global Carbon Project).

For instance, in China, strong preventive measures for COVID-19, such as lockdown got implemented by the end of 2019, which, as a result, impacted the main commercial and economic activities of China. Power plants and industries ceased their manufacturing and production. Also, there was a considerable decline in the use of public and personal transportation by the people.

Which, in turn, resulted in a drastic fall in concentrations of Nitrogen Dioxide (NO₂) and Particulate Mat-
ter 2.5 (diameter ≤ 2.5 μm) in big cities of China. Similar effects have been observed in places like Europe, where the quality of air has dramatically improved since governments have implemented lockdown policies. Economic and other major activities have ceased temporarily.

For example, reduced transportation caused less emission of Greenhouse gases. Figure 3 View from countries like France, Germany, Italy, and Spain is showing a fall in the concentration of NO₂. (Muhammad et al., 2020; Scroll.in, 2020) Also, measures adopted by the government of most of the affected countries like lockdown and social distancing have resulted in less polluted seashores and coastal regions around the world, improving water quality and reduction in the amount of dirt spreader by the people visiting these places.

Similarly, noise pollution has also came into check in affected nations. Less use of transportation and other activities for commercial purposes has reduced noise pollution.

This article targets to highlight the positive consequences of the COVID-19 on the ecosystem. Indirect results have been presented after inspecting the subject in an unbiased manner.

Positive consequences of COVID-19 on the ecosystem

Air Quality

The Air quality is measured by the presence of four common air pollutants, which are as following:

1. Particulate Matter (PM)
2. Ozone (O₃)
3. Nitrogen dioxide (NO₂)
4. Sulfur dioxide (SO₂).

NO₂ is emitted in the atmosphere by the burning of fuel from various vehicles and other means of transportation, power station, and factories.

Breathing in air with a high amount of NO₂ can cause respiratory diseases, like asthma, which may present as coughing, wheezing or breathing difficulty. Air pollution is one of the world’s most deadly killers. It claims more than 7 million lives each year, and it shaves off on average about three years of our lives.

PM2.5 is considered the most harmful forms of air pollutants. The Particulate Matter has sulfate, nitrates, NH3, NaCl, black carbon, mineral dust and water as it’s a major component. Because of it’s smaller diameter (2.5 microns), it can pass through the lung’s defence barrier and reach the bloodstream. They also come in the category of Group 1 carcinogens and are responsible for causing lung cancer and various other cardiovascular and respiratory-related major health issues. Almost 4 million people in the world have died because of it (WHO, 2020).

Good air quality is a basic need for a person to stay healthy and for his well-being; however, most of the population in the world, almost more than 90 %, are residing in areas where air pollutants are present in the air above their permissible limit. As a result of which air quality is getting affected and cause the death of approximately 2M premature (WHO) per annum. WHO guideline values for air quality

Particulate Matter (PM)

1. Fine particulate matter (PM₂.₅) – 10 μg/m³ annual mean; 25 μg/m³ 24-hour mean.
2. Coarse particulate matter (PM₁₀) - 20 μg/m³ annual mean; 50 μg/m³ 24-hour mean

Strict implementation of restrictions of movement and lockdown has aided in controlling the spread of the COVID – 19 pandemic. These steps have also played a major role in the reduction of air pollution and thick smog has given way to a blue sky. Residents have been enjoying some unusually fresh air.

Because of the implementation of lockdown, NO2 has reduced to a level of 22.8 μg/m³ and 12.9 μg/m³ in China’s Wuhan city. Also, a fall in particulate matter 2.5 level by 1.4 μg/m³ has been observed.

Copernicus Sentinel-5P satellite has taken some readings to show evidence on the drastic change in NO₂ concentrations over major cities in Europe due to the implementation of self-quarantine strictly. Figure 1 and Figure 2 shows the concentration of NO₂ and its comparison from March 2019 to March 2020.

According to an article published by Forbes, it has been stated that 77,000 lives have been saved from dying of respiratory diseases in China alone by reduced air pollution due to Coronavirus lockdown. (Park, 2007)

Water quality

Water is an essentiality for human life. It is a universal solvent that can dissolve most of the toxic solvents produced by farms, factories and cities, which results in affecting its quality. Mostly untreated waste materials and effluents are being discharged
into water bodies like streams, river, lake, ocean, aquifer, directly causing water pollution.

The Lancet published a study stating that 1.8 million deaths in 2015 were caused due to water pollution, and about 1 billion people fall sick due to the intake of unsafe water.

Due to the lockdown and closing of industrial units, improvement in the water quality of the ocean and major river have been observed. One such example is the clean water of rivers like Yamuna and Ganga in India.

The Vice-chairman of Delhi Jal Board, Raghav Chadha, says, ”The stoppage of industrial pollutants and industrial waste has definitely had a positive effect on water quality the Yamuna River”. Residents of Delhi also confirms the report. Not just that, a significant improvement in Ganga river’s Quality is also observed. “ One-tenth of the pollution in the Ganga river comes from industries. As industries are shut due to lockdown, the situation has become better. We have seen a 40-50 percent improvement in the Ganga. It is a significant development, ” Dr PK Mishra, Professor at Chemical Engineering and Technology, IIT-BHU, said. ” Due to rainfall on March 15-16 in areas where Ganga flows, the water level has also increased, which means that its cleaning capacity has also increased. There is a considerable improvement if we look at the pre-lockdown period and after March 24 “.

The land around the sea and coastal areas are one of the most integral parts of the local ecosystem, which consist of the food chain supported by the plants, insects and animals residing by the coast. Coastal areas are helpful for human life as they provide an area for tourism, recreational activities, land and sand, which is essential for the survival of people residing near the coastal area. However, pollution has been increasing in the coastal areas by the irre-
Figure 3: View of some regions of Europe showing changes in NO\textsubscript{2} concentration

Figure 4: Representing indirect positive consequences of SARS-CoV2 virus on environment

Sponsorable behaviour of the people residing nearby or by the people who visit these places.

Due to lockdown and travel restrictions around the world, a notable change is seen in many coastal regions around the world. They now appear cleaner and with water being crystal clear.

One such example has been observed in Mumbai city of India, which is famous for its beaches. The local residents speaking to a news agency, states that “I have never seen the Juhu beach so clean”. (Park, 2007; Bora, 2020)

**Environmental noise pollution**

Environmental noise pollution is produced by unwanted sounds that are generated by human-induced activities like honking vehicles, air crafts and music at high intensity or pitch.

The recommended guidelines for community noise is \( \leq 30 \) A-weighted decibels (dB(A)) inside the bedrooms, especially during the night time for induction of good quality sleep and \( \leq 40 \) dB(A) of annual average (night) outside the bedrooms to prevent adverse health effects from night noise.

Also, the noise level of \( \leq 35 \) dB(A) in places of learnings like classrooms might generate good educational conditions in terms of learning and teaching as well.

It is one of the main sources of discomfort for the
population and the environment, causes sleep disturbance, cardiovascular effects, psychophysiological effects, poorer work and school performance, provokes annoyance and social behaviour changes, hearing impairment, etc. and altering the natural conditions of the ecosystems.

The imposition of quarantine measures by most governments has caused people to stay at home. With decreased use of transportation and ceased commercial activities, the noise level have dropped notably in most cities of the world. According to an article published by one of the most renowned news media of India, the Govindpuri Metro station area, which had sound decibels of around 100 dB daily, has came down to around 50-60 dB due to reduced traffic and vehicles on roads.

In addition, Dr Faiyaz Khudsar, scientist-in-charge at Yamuna Biodiversity Park (YBP), says, " noise level above 20 dB(A) are known to disturb birds. However, with reduced human activity and noise, their chirping is being heard clearly now ".

**Climate Change**

Climatic change is indicated by the “ radiative forcing ” or heating effect caused by Greenhouse gases present in the atmosphere.

**Greenhouse gases**

Carbon dioxide, Methane, Nitrous oxide, Fluorinated gases are produced by human activities such as the burning of fossil fuels (oil, natural gas, and coal), solid waste, and trees and wood products. Other causes are deforestation, soil degradation, industrial processes, commercial and household uses. It results in ozone depletion that causes global warming and other climatic changes.

Total Greenhouse gas emission by economic sector in 2018-
- Agriculture – 9%
- Commercial & Residential – 12%
- Transport – 28%
- Electricity – 28%
- Industry – 22%

According to the Global Carbon Project publication - " Due to forced confinement and reduced activity due to government policies daily global CO₂ emissions decreased by ~17% (~11 to ~25% for ±1σ) by early April 2020 compared with the mean 2019 levels, just under half from changes in surface transport. At their peak, emissions in individual countries decreased by ~26% on average. The impact on 2020 annual emissions depends on the duration of the confinement, with a low estimate of ~4% (~7%) if pre-pandemic conditions return by mid-June and a high estimate of ~7% (~3 to ~13%) if some restrictions remain worldwide until the end of 2020". Coronavirus can be considered as the biggest trigger in the fall of carbon emission after World War II.

Since the spread of covid 19 among humans started from one of Wuhan’s open-air “wet market” and there were customers who came to buy fresh meat and fish, including animals that are killed on the spot, created a situation of panic among people regarding consumption of meat and other animal-based products. People restricted consumption of food from outside during lockdown; their non-vegetarian diet shifted more towards vegetarian and plant-based products, which indirectly helped in the reduction of global warming and emission of greenhouse gases.

As a matter of fact, about 25% of all the global climate change problems we’re seeing can be attributed back to the food and the choices that we’re actually making about what we eat on a daily basis. This is greater than all the cars on the planet. In fact, it’s twice as much global warming pollution as cars. If you really look at everything that went into making a single serving of beef, we end up emitting around 330 grams of carbon. That’s like driving a car three miles. Now, if you choose chicken instead, there’s more than a fivefold drop in emissions. And if you switch to fish, the number goes down even more. If beef is swapped out entirely with lentils, well, it’s down to practically nothing (2g).

Livestock account for a little over 14% of global greenhouse gas emissions, which is equal to transport (cars, trucks, planes, trains and ships on the planet combined). Ruminant animals produce methane which is at least 25 times more potent than carbon dioxide. Also, it takes a lot of land, fertilizer and about a billion tons of grain to feed all of that livestock. We could feed 3.5 billion people with that grain; if we were just directly eating these grains ourselves, it would eliminate a lot of the CO₂ that is emitted from cattle production. So it’s clear that meat has a pretty big carbon load. Reducing meat consumption will help the climate a lot. Solution to that is switching to vegans, vegetarian or Mediterranean diets. Mediterranean diet can actually solve 15% of the global warming problem. If everyone moves towards it, then it will be equivalent to taking somewhere around 1 billion cars off of the streets in terms of vehicle carbon emissions each year. Another way is cutting down your portion size to the doctor recommended 4 ounces which can reduce the emissions by half.
Wildlife

Complete restriction of people inside their houses as a preventive measure for COVID-19 pandemic and reduced economic activities and their interference with wildlife has helped animals to reclaim their space in the ecosystem to a certain extent as considered by environmentalists.

From a climate perspective, the coronavirus pandemic hasn’t been entirely negative. It’s like a strange picture to us humans who used to only see ourselves governing the world but as soon as we withdrew, nature has quickly taken over, which is a matter of rejoice for environmentalists because immediately implemented measures have caused a sudden positive shift which otherwise might have taken years to come into effect.

Due to the decline in activities like fishing, fish biomass will increase, which was reduced due to overfishing and other activities like pollution of water resources which was the death of aquatic animals.

Apart from this, multiple images have been uploaded on social media showing rare wild animals freely moving around roads and residential areas, which never used to happen before, and migratory birds have been observed to stay longer in sanctuaries. Their extended stay has been a result of lockdown.

Renewable Source of Energy

Renewable energy source in the form of energy that is extracted from natural resources or renewable resources like sunlight, wind, rain, tides, waves, geothermal heat, and biomass. Economy at the present time is extremely interlinked with fossil fuels like coal, oil, petroleum and other non-renewable forms of energy as primary sources of energy for running the manufacturing industry and the transportation sector, and are also responsible for the generation of electricity and other domestic and commercial activities worldwide. This might be the reason because of which, when the transport industry screeches to a halt and electricity demand falls worldwide, then the carbon emission goes down and this is the reason that when the lockdown will be retracted, then the world becomes “normal” again, and the carbon emission and pollution are going to go back up again. A similar kind of incident happened in China after the lockdown was removed, but there is an opportunity amongst this unpleasant news. A lot of industries have already shut down, a lot of people have already faced job losses in this economic crisis, and the government can use this opportunity to push the world towards the renewable energy industry. When the government transfer money to the industries to revive themselves again and to revive the economy again, then the government should focus more on renewable energy and its utilization for industrial, commercial and domestic purposes. The coal, oil and petroleum industries should not be given a lot of support so that the shut industries remain shut and renewable energy gets a new lease of opportunity. It remains to be seen how many actions do the government take on this and how much pressure does the public maintains upon the governments compelling them to take strict actions on implementation of the same. Figure 4

DISCUSSION

It intends on highlighting over the positive consequences of COVID – 19 on the ecosystem, which mainly involves a decline in Particulate matter 2.5 and NO2 concentrations in air. Higher concentrations of these two were the main threat to the life of people residing in developed countries.

Also, the reduced amount of waste around beaches and inside the water bodies have shown tremendous improvement for recovery of the previously caused damages in the ecosystem.

The article also shows the positive impact of corona on reducing noise pollution and decrease in Greenhouse gases emission, which resulted in improving the climatic changes for good, occurring throughout the year and assisting wildlife replenishment of animals and plants.

The coronavirus crisis has shown a great impact on the world’s economy and global emissions, but the pollution levels are again on the surge as the countries are coming out from lockdown. Due to the restart of commercial and industrial works for compensating the economic loss, the positive effects seem to be short-lived.

All these positive impacts were only due to strict policies implemented by the government but, as the countries are coming out of lockdown, coming chances of all the pollution level back to its previous state are increasing which would end up wasting all the revival process which has happened throughout the lockdown phase.

One such example was seen in China, where carbon emissions decreased down by 25% during the month of February and March during a lockdown and as the lockdown was removed by the end of the month of March, the levels reached back to their previous level (Financial Times report). (Manisalidis et al., 2020; Financial Times, 2020)
CONCLUSION

Finally, it can be summarized in a way that COVID-19 has created many positive consequences on the ecosystem, but if proper steps are not taken by the government for measuring the number of pollutions and managing the waste production, it may all go in vain. A reduced amount of Greenhouse Gases for a limited time period only is not an acceptable way of keeping the environment pollution free. So, Govt. can use the opportunity to support the renewable energy industry as an opportunity in the situation of crisis and should limit the investment over industries like coal, oil and petroleum.

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Conflict of Interest

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REFERENCES


