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RESEARCH ARTICLE

COVID-19 - A BOON FOR ENVIRONMENT??

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Abstract

Nationwide/Worldwide lockdown in the midst of COVID-19 pandemic has elicited significant environmental benefits including cleaner/fresher air, lower carbon emissions and a relief for wildlife. All types of industries, vehicle movement, and people's activities have been shut off for a month or more in many parts of the world, including closing of schools, malls, offices, shops, hotels, etc., and also the directives where given by governments to prevent public gatherings at temples, function halls, parties, and other places perhaps for the first time in modern history. Various literature states that the increased industrialization and anthropogenic activities in the last two decades polluted the atmosphere, hydrosphere, and biosphere. Significantly, there was a marked improvement in the prevailing conditions in the aforementioned spheres of environment. Over a month/two months into the nationwide lockdown, air and water pollution levels have shrunk and the wildlife is free. With only essential and emergency services running, the vehicular emissions and industrial effluents released are being drastically reduced. The air quality index (AQI) is showing green in most cities, rivers are self-cleansed, temperatures are dropping and much more is yet to come. Nature is healing and environment is recharging.

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Introduction:-

Worldwide lockdown due to COVID-19 has shutdown the industrial activities globally. Among many other sectors, transport is the most adversely affected sector due to lockdown. Road and air transport were halted due to the enforcement of lockdown. According to the reports, air travel dropped by 96% due to COVID-19, lowest in 75 years. Furthermore, not only transport sector but also industrial and manufacturing sector is heavily affected by pandemic. COVID-19 has severe negative impact on human health and world economy; however it also results in pollution reduction due to limited socio-economic and industrial activities. Environmental pollution is reduced up to 30% and this fall coincides with the imposition of a countrywide quarantine, travel restrictions, and the shutting down of power stations and industries.

Currently, most countries have tried to fight the spread of the virus with massive COVID-19 screening tests and establishing public policies of social distancing. It is clear that the priority revolves around people's health. For this reason, the indirect impact of the virus on the environment has been little analyzed. The first studies estimated a

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positive indirect impact on the environment. On one hand, climate experts predict that greenhouse gas (GHG) emissions could drop to proportions never before seen since World War II (Global Carbon Project, 2020). This outcome is mainly due to the social distancing policies adopted by the governments following the appearance of the pandemic.

The American space agency, NASA, is funding four projects that will aid researchers by using satellite imagery and other data resources to correlate the impact of pandemic-related lockdowns to global pollution levels.

1. One such project looks to study the perceived gains in air quality in different countries by linking satellite data to multiple data sets like weather, traffic-related information, and temperature.
2. A similar project will combine meteorological data with satellite imagery to study the extent to which air pollution has reduced in the upper reaches of the atmosphere.
3. A third related project will look into the effect of lower air pollution on the quality of water,
4. While a fourth such initiative will employ light pollution satellite data to study the socioeconomic impact and efficacy of shelter-in-place orders that have been issued in most countries across the world.

The worldwide disruption caused by the COVID-19 pandemic has resulted in numerous impacts on the environment and the climate. The severe decline in planned travel has caused many regions to experience a drop in air pollution. In China, lockdowns and other measures resulted in a 25 per cent reduction in carbon emissions and 50 per cent reduction in nitrogen oxides emissions, which one Earth systems scientist estimated may have saved at least 77,000 lives over two months.

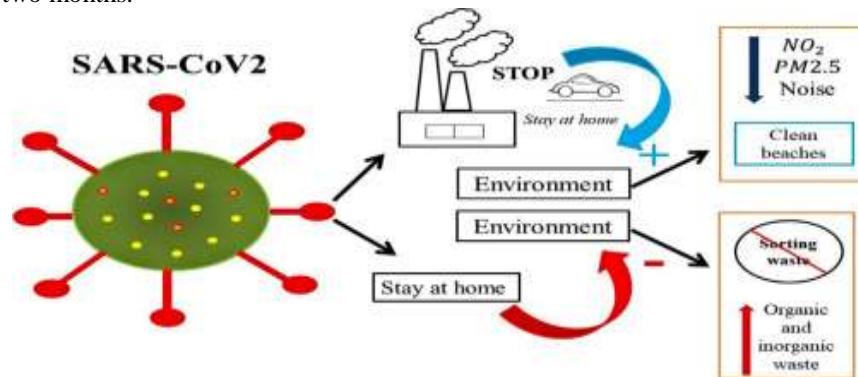


Fig 1:- Positive and Negative Impacts of Covid-19 on Environment.

However, the outbreak has also provided cover for illegal activities such as deforestation of the Amazon rainforest and poaching in Africa, hindered environmental diplomacy efforts, and created economic fallout that some predict will slow investment in green energy technologies. Up to 2020, increases in the amount of greenhouse gases produced since the beginning of the industrialization era caused average global temperatures on the Earth to rise, causing effects including the melting of glaciers and rising sea levels.

Impact of covid-19 lockdown on environment

Before the start of the COVID-19 pandemic, the air around us had been deemed very toxic to breathe in due to the amount of greenhouse gases that had been emitted over the centuries. The Earth faced rising temperatures, which in turn led to the melting of glaciers and rising of sea levels. Environmental degradation was happening fast due to the depletion of resources such as air, water and soil. But after the coronavirus lockdown commenced, there have been slight changes in the environment.

Improved Air Quality

Nationwide lockdown due to COVID-19 pandemic has caused industrial activity to shut down and cancelled flights and other journeys, slashing greenhouse gas emissions and air pollution around the world. NO_x pollution is mainly caused due to high motor vehicle traffic, the major source of NO₂ emissions that has reduced during the lockdown.

The Centre for Research on Energy and CleanAir reported that methods to contain the spread of coronavirus, such as quarantines and travel bans resulted in a 25 per cent reduction of carbon emission in China. In the first month of lockdowns, China produced approximately 200 million fewer metric tons of carbon dioxide than the same period in 2019, due to the reduction in air traffic, oil refining, and coal consumption.

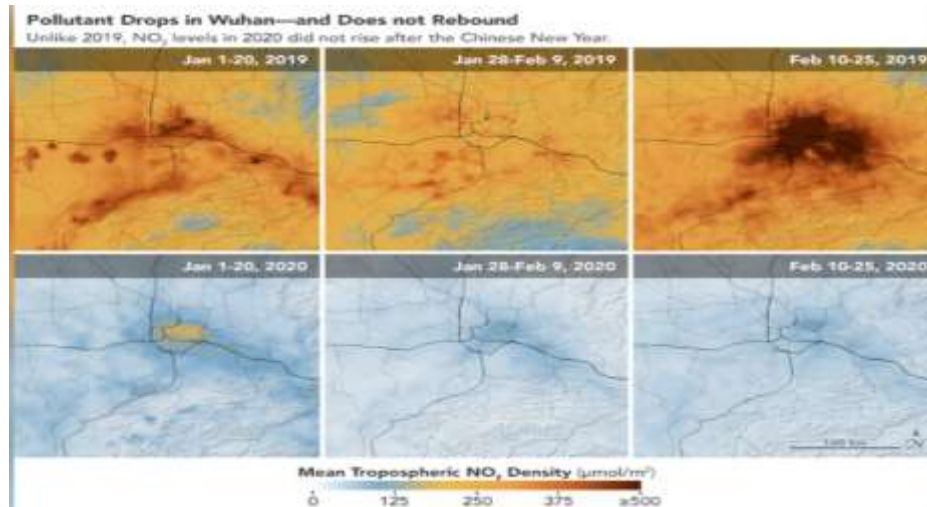


Fig 2:- Satellite Mapping of Pollutants in Wuhan, China.

India is currently under the biggest lockdown with around 130 crore people asked to stay home in view of the corona virus outbreak and continued to breathe easy as pollution level in 88 cities across the country remained minimal. According to the Centre-run System of Air Quality and Weather Forecasting and Research (SAFAR), the impact of the measures taken due to the coronavirus outbreak has resulted in a drop in PM_{2.5} (fine particulate pollutant) by 30 per cent in Delhi and by 15 per cent in Ahmedabad and Pune. As per the March reports, pollution was in the "moderate" category (Air Quality Index range: 100-200) while presently, it is in the "satisfactory" (AQI 50-100) or "good" (AQI 0-50) category.

Signs of improvement in Water Quality

The nationwide lockdown has elicited signs of improvement in water quality with zero industrial pollution. During the lockdown period, the major industrial sources of pollution that affect aquatic ecosystems, such as industrial wastewater disposal, crude oil, heavy metals, and plastics have shrunk or completely stopped.



Fig 3:- Pollution of Hydrosphere.

On the other hand, the status of pollution in the hydrosphere that includes lakes, rivers, oceans, and groundwater reservoirs, has not been investigated. For decades, the hydrosphere has been severely polluted because of rapid urbanization, industrialization, and overexploitation. Therefore, the level of pollution is expected to be reduced. For example, news media reported that the Grand Canal in Italy, where the COVID-19 crippled the whole nation, turned clear, and reappearance of many aquatic species.



Fig 4:- Fish Visible in Venice Canals as Water is Clean.

Similarly, the Ganges, a sacred but severely polluted river in India, turns cleaner at several places during the nationwide lockdown period that started on 25th March 2020.

Reclaiming of Wildlife

As soon as humans emptied the streets due to enforcement of lockdown, animals took over. It's not just in India. From the US to France, Italy to Japan, Poland to England, animals have truly come out of the wild. It is a lesson in human-wildlife conflict that tells us how we have occupied their spaces and how animals reclaim them.

Many wildlife species were spotted walking on the streets and animals world over are rejoicing the newfound freedom and extra space to move around. Perhaps it's the nature's way to bring balance in biodiversity and give back to other species what we have forcibly taken from them.

Greenness of Vegetation

Plants are growing better because there is cleaner air and water, and because yet again there is no human interference. With everything at a standstill, plants are allowed to thrive and grow and produce more coverage and oxygen. Less litter also means lesser clogging of river systems, which is good in the long run for the environment.

Break from Noise pollution

Empty roads with a drop in transportation and absence of commercial activities have greatly reduced noise pollution levels during the lockdown. Clanking of machinery in factories, buzzing of car horns and whirring of vehicular engines have now been replaced by chirping of birds in the dawn and the dusk. The lockdown has resulted in an increase in the population of birds in the country. Resident birds are breeding much more than before due to less human activity, no noise and air pollution.

Studies showing positive impact of covid-19 on environment

1) Between 1 January and 11 March 2020, the European Space Agency observed a marked decline in nitrous oxide emissions from cars, power plants, and factories in the Po Valley region in northern Italy, coinciding with lockdowns in the region. NASA and ESA have been monitoring how the nitrogen dioxide gases dropped significantly during the initial Chinese phase of the COVID-19 pandemic. The economic slowdown from the virus drastically dropped pollution levels, especially in cities like Wuhan, China by 25-40%. NASA uses an ozone monitoring instrument (OMI) to analyze and observe the ozone layer and pollutants such as NO₂, aerosols and others. This instrument helped NASA to process and interpret the data coming in due to the lock-down worldwide. According to NASA scientists, the drop in NO₂ pollution began in Wuhan, China and slowly spread to the rest of the world.

2) A study published in May 2020 found that the daily global carbon emissions during the lockdown measures in early April fell by 17% and could lead to an annual carbon emission decline of up to 7%, which would be the biggest drop since World War II according to the researchers. They ascribe these decreases mainly to the reduction of transportation usage and industrial activities.

3) The air pollution levels have decreased to such a degree that distant things like the lofty mountain peaks are visible in several areas. In a Bihar village, people recently claimed to have woken to the breathtaking view of snow-capped Himalayan peaks, something they had not witnessed in decades.

4) The Venice mayor's office clarified that the increase in water clarity was due to the settling of sediment that is disturbed by boat traffic and mentioned the decrease in air pollution along the waterways.

5) Beaches are one of the most important natural capital assets found in coastal areas. They provide services (land, sand, recreation, and tourism) that are critical to the survival of coastal communities and possess intrinsic values that must be protected from overexploitation. However, non-responsible use by people has caused many beaches in the world to present pollution problems. The social distancing measures adopted by most governments have caused many beaches around the world to get cleaned up. This as a result of the reduction in waste generated by tourists who visit the beaches.



Fig 5:- River Yamuna in 2019 and 2020.

6) Demand for fish and fish prices have both decreased due to the pandemic, and fishing fleets around the world sit mostly idle. German scientist Rainer Froese has said the fish biomass will increase due to the sharp decline in fishing, and projected that in European waters, some fish such as herring could double their biomass.

7) As people stayed at home due to lockdown and travel restrictions, some animals have been spotted in cities. Sea turtles were spotted laying eggs on beaches they once avoided (such as the coast of the Bay of Bengal), due to the lowered levels of human interference and light pollution.

8) In the transport sector, the pandemic could trigger several effects, including behavioral changes – such as more teleworking and teleconferencing and changes in business models – which could, in turn, translate in reductions of emissions from transport.

9) Likewise, noise levels have fallen significantly in most countries. The decrease in the use of private and public transportation, as well as commercial activities, has caused a reduction in noise.

Studies Showing Negative Impact Of Covid-19 On Environment

1) Conservationists expect that African countries will experience a massive surge in bush meat poaching. Matt Brown of the Nature Conservancy said that "When people don't have any other alternative for income, our prediction -- and we're seeing this in South Africa -- is that poaching will go up for high-value products like rhino horn and ivory." On the other hand, Gabon decided to ban the human consumption of bats and pangolins, to stem the spread of zoonotic diseases, as the novel coronavirus is thought to have transmitted itself to humans through these animals.

2) The disruption from the pandemic provided cover for illegal deforestation operations. This was observed in Brazil, where satellite imagery showed deforestation of the Amazon rainforest surging by over 50 per cent compared to baseline levels.

3) As a consequence of the unprecedented use of disposable face masks, a significant number of masks were discarded in the natural environment, adding to the worldwide burden of plastic waste.

4) On the other hand, there could be a shift away from public transport, driven by fear of contagion, and reliance on single-occupancy cars, which would significantly increase emissions.

5) On the other hand, some industries have seized the opportunity to repeal disposable bag bans. Companies that once encouraged consumers to bring their bags have increasingly switched to single-use packaging.

6) Finally, online food ordering has increased. These growths are resulting in the increase of domestic waste, both organic and inorganic. The quarantine policies, established in most countries, have led consumers to increase their demand for online shopping for home delivery. Consequently, organic waste generated by households has increased. Also, food purchased online is shipped packed, so inorganic waste has also increased.

7) Waste recycling has always been a major environmental problem of interest to all countries. Recycling is a common and effective way to prevent pollution, save energy, and conserve natural resources. As a result of the pandemic, countries such as the USA have stopped recycling programs in some of their cities, as authorities have been concerned about the risk of COVID-19 spreading in recycling centers. In particularly affected European countries, waste management has been restricted. For example, Italy has prohibited infected residents from sorting their waste.



Fig 6:- Bio-Medical Waste being discarded in Open areas.

8) Also, some industries have seized the opportunity to repeal disposable bag bans, even though single-use plastic can still harbor viruses and bacteria.

9) China has asked wastewater treatment plants to strengthen their disinfection routines (mainly through increased use of chlorine) to prevent the new coronavirus from spreading through the wastewater. However, there is no evidence on the survival of the SARS-CoV2 virus in drinking water or wastewater. On the contrary, the excess of chlorine in the water could generate harmful effects on people's health.

10) Most of the animals that are in cities, zoos, and other places where they used to live on food fed by locals are now facing extreme hunger due to lockdown as very few people have taken interest in feeding them.

11) Many of the ecotourist spots and places have taken a major blow as the tourism is restricted due to lockdown and the economy for care taking of these places is running low.

12) Water scarcity has been a common issue to all of us. But especially in the pandemic situation the issue has been raised a certain level that the water is unavailable to use for the hygienic purpose because most of the poor countries lack even proper drinking water. As the world's 20% of population walks for more than 3 miles to get the drinking water.

Conclusion:-

It is essential to mention that although the emissions of some GHGs have decreased as a result of the pandemic, this reduction could have little impact on the total concentrations of GHGs that have accumulated in the atmosphere for decades. For a significant decline, there should be long-term structural change in the countries' economies. This

result can be achieved through the ratification of the environmental commitments made. Furthermore, the decrease in GHG emissions currently observed in some countries is only temporary. Since once the pandemic ends, countries will most likely revive their economies, and GHG emissions will skyrocket again.

On the other hand, the safe management of domestic waste could be critical during the COVID-19 emergency. Medical waste such as contaminated masks, gloves, used or expired medications, and other items can easily be mixed with domestic waste. However, they should be treated as hazardous waste and disposed of separately. Furthermore, this type of waste must be collected by specialized municipal operators or waste management operators. Along these same lines, the UN Environment Program urged governments to treat waste management, including medical, domestic, and other waste, as an urgent and essential public service to minimize possible secondary health and environmental effects.

60% of emerging transferable diseases originate from animals, and 70% of these are supposed to originate in wild animals. So, the unrestricted wildlife trade might enhance the risks of emerging new viruses. Many scientists have urged different countries to permanently ban the wildlife markets and trades. These actions would help to protect human lives from future pandemics like COVID-19. Therefore, considering the national security, biosafety, and public health, it is essential to globally ban wildlife markets and trades.

As corona virus spread continues, scientists have warned that the threat by new bacteria and viruses can't be taken lightly anymore. And global warming is the most important cause as it leads to unfreeze the thousands of years old viruses and bacteria trapped in them to be released. Strengthening health systems, improved surveillance of infectious disease in wildlife and humans, and greater protection of biodiversity and the natural environment, should reduce the risks of future outbreaks of other new diseases.

We, the humans are one of the species on this earth but we evolved to be the most dominant species. We are continuously upgrading and updating ourselves using the nature's resources and in turn degrading the environment through the anthropogenic activities. We survived through all these times because we are adaptable. In the beginning era we used to live in harmony with the nature worshipping and fearing its wrath. But presently as we are depleting the resources for our comforts in hindsight of harming ourselves. We are a part of nature, harming the nature is in turn harming ourselves. So, we have to preserve the beauty of nature at any cost and it starts by stepping out of that comfort zone.

Finally, it is concluded that COVID-19 will produce both positive and negative indirect effects on the environment, but the latter will be greater. Furthermore, the virus crisis brings other environmental problems that may last longer and maybe more challenging to manage if countries neglect the impact of the epidemic on the environment. The COVID-19 lockdown is a lesson for humans to rethink their relationship with the nature and the pandemic could show us how the future might look with sustainable environment, or it may just indicate the pursuit of the challenge ahead.

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