



An Overview-Effects of Covid 19 Pandemic on Climate Change in India

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ABSTRACT

From a public health perspective, the spread of the COVID-19 virus has become a problem. The incredible rise in disease-related infection and death rates has brought the world to a standstill in dealing with its negative consequences. This has led to a global lockdown to prevent further spread of the virus. The blockade had a huge social and economic impact. However, it also has some positive effects on the environment, especially air quality, as many research institutes point to reduced nitrogen dioxide and carbon monoxide problems in major cities (PM) around the world. Nitrogen dioxide emissions were reduced by 20-30% in China, Italy, France and Spain, while nitrogen dioxide emissions were reduced by 30% in the United States. Compared to last year, China's air quality improved by 11.4%. NO (-77.3%), NO₂ (-54.3). Compared to five years per month, 3% and carbon monoxide (-64.8%) (Signs point to a decrease) content were found during Partial shutdown in Brazil. There are about -51.84, -53.11, -17 in India 97%, -52.68, -30.35, 0.78, and -12.33 reductions in PM10, PM2 concentrations. They are SO₂, NO₂, CO, O₃ and NH₃. This article focuses on the environmental impact of closures and also discusses air pollution before and after closures in major cities around the world. Various aspects of the environment were studied and evaluated, including air, water, noise and waste management before and after closure. Therefore, this research will serve as a guide for environmentalists, leaders, and frontline activists as they look for ways to beat this disease and reduce its long-term impact on health and the environment.

Graphical Abstract:



Keywords: Environment; Covid-19; year 2020; shutdown; impacts and life.

1. INTRODUCTION

The flare-up of COVID-19 widespread the disturbing exponential spread of diseases has made wellbeing emergencies all through the world. The illness was detailed in the month of the December year 2019 in city Wuhan of China. In any case, its presence has been detailed a couple of decades back. The infection that was afterward renamed COVID-19 had as of now influenced more than 100 nations Organization, 2020 sometime recently its discovery. The illness postured a worldwide danger after its destroying comes and containing the deadly infection known that time and to manage up with and the negative results of the viral infection, numerous nations have received activities to reduce

anthropogenic intuitive that include authorization of strict quarantines, the forbiddance of open social occasions, confinements on diverse transportation implies, support of social separating, forcing curfews and lockdowns. After the confirmation of first the COVID-19 reported from India on 30th of January 2020, counselling posturing limitations with respect to worldwide voyages to the nations like China, Italy, Islamic Republic of Iran, Republic of Korea and Japan nations were forced on Walk 11, 2020. The India state of Kerala was at first the foremost COVID-19 influenced state in India. The circumstance in this way requested the execution of security measures to diminish the effect of this new infection. Places/areas/cities of huge gatherings like teaching/School/college/universities, shops/

malls city centres and movie theatres were closed over Indian from Walk 16, 2020. The primary nation-wide shutdown was forced for 14 h on Walk 22, 2020, taken after instantly by a add up to lockdown of 21 days starting from Walk 24, 2020 [1-5]. Most population bases countries like China, India with a mass populace of more than 1.353 billion, is moreover battling against COVID-19. Modern Delhi is one of the most polluted cities in the world with PM_{2.5} 32.8 µg/m³ (World Health Organization). The impact of focal pollution has a positive effect on welfare. It is important to consider such national pollution problems today as the country's economy depends on the control, transportation, development, agricultural industry and improvement of the country. The significant effect of the COVID-19 lockdown is seen in improved communication, which is publicly visible and documented in various official reports. Brown haze has given way to blue skies in cities like Delhi, marine life is very active, pollution levels have dropped in almost every major city, and creatures along with feathered creatures stand up to their claims. It is also observed that in major cities such as Delhi, although the sense of power is high, the closure has raised the quality of negotiations to a better scale. A comprehensive report on the effectiveness of communication from various locations in India indicated that the effectiveness of COVID-19 countermeasures is significantly and clearly improved in the effectiveness of communication. Deaths due to poor quality of care in 2016, according to WHO data [1], amounted to approximately 4.2 million. A positive impact on the Call Quality Recording (AQI) during the lockdown period in India would certainly turn the tide. Natural ash record information shows that Delhi is one of the 100 most visibly polluted cities in the world [5-7] and its position on the list of particulate matter (PM₁₀) pollution is extremely high [8-12]. National Comprehensive Air Quality Measurements (NAAQS) show that Delhi's PM_{2.5} concentration is extremely high and well above the average limits. This high-intensity pollution has been shown to cause obvious health problems, especially respiratory diseases. The primary objective of the reflection is to evaluate the significant impact of the lockdown due to COVID-19 on the quality of India's trade. This analysis sought to examine not only the quality status but also the impact of the barrier on water pollution and disturbance. The analysis highlighted the challenges associated with the era of waste and its reuse. The results of this analysis show that

the new coronavirus can be considered a hidden facilitator [13].

2. POLLUTANTS BEFORE THE COVID LOCK DOWN AND AFTER LOCK DOWN

The levels of these toxins in Delhi decreased significantly (Fig. 1, Table 1) following a 3-week lockdown period beginning on March 24, 2020. During this cooling-off period, concentrations of PM₁₀, PM_{2.5}, CO and NO₂ (Fig. 1a-e). There was a decrease of approximately -51.84% and -53.11% (a negative sign indicating a decrease) only within the gross totals for PM₁₀ and PM_{2.5}. In any case, the amount of PM_{2.5} decreased by -62.61% and -59.74% (negative sign indicating a decrease), as indicated by the activity and mechanical stations. There was a significant difference in the rate of elimination of toxic substances between the previous period and the blocking period (-52.68% NO₂ and -30.35% CO). Comparable results were obtained for the city of Kolkata, where a large reduction of PM₁₀ and PM_{2.5} was observed from the 25th trip to 15th May 2020 compared to the previous 3 days. During this period, the PM₁₀ level decreased to 8.94% compared to 2019. In addition, a 19.46% decrease in NO₂ concentration was recorded among Kolkata's vegetation. Additionally, poison SO₂ levels were reduced to 5.36 µg/m³ in 2020. The decrease in PM₁₀, PM_{2.5}, CO and NO₂ concentrations can be primarily attributed to a significant reduction in vehicle wear and tear. vehicle exhaust mechanics of the green period [14].

In any case, this exceptional reduction was not specified for SO₂ (-17.97 %) and NH₃ (-12.33 %) (Fig. 1 c, g). The ozone concentration (+0.78% total) showed a slight increase during the study period with a non-significant rising current (Fig. 1f). A similar increasing trend was observed in ozone concentration, which was similar to an increase in O₃ concentration to 9.73% in April 2020 in Kolkata. Furthermore, this increase in ozone concentration at the controlled production and transportation sites was due to the reduction in nitric oxide (NO) levels that occurs with the use of moo O₃ (>10% increase) (Table 1). Furthermore, it is an unusual fact that the O₃ density in Kolkata has increased during this continuous period of lockdown. Overall thread quality is observed from NAQI data for past and during the lock-in (Fig. 1h), which shows a decrease in NAQI during the lock-in period (Indian National Discussion Quality Standard;

CPCB 2015). An improvement of approximately -59.45% (net reduction NAQI: 128.0) and -52.92% (net reduction NAQI: 103.93) was noted in the quality of discussion in the mechanical and behavioral areas, respectively, during the final period. This means that a significant improvement in discussion quality is expected if strict application of the guidelines for monitoring and predicting discussion quality improves. Findings from the current study may help drive improved pollution abatement practices, advanced visualization, and quality estimates for well-being and environmental improvement.

3. INDIA AIR QUALITY INDEX BEFORE AND AFTER COVID LOCK DOWN FIRST OF 2020

The impact of the lockdown on yarn quality between March 3 and April 14, 2020 was examined and appeared in (Fig. 2). One day after the lockdown began (March 25, 2020).

The critical improvement in chat quality (Fig. 2e) compared to the pre-lockdown phase was detailed. The NAQI appeared to decrease by 51% on the fourth day (2020 walk 27) of block (Fig. 2f) compared to the actual data on the previous third day (2020 walk 21) of block (Fig. 2d). During the isolation period, there was a 43% decrease in the NAQI (April 24-14, 2020) compared to the 3-week walk NAQI (April 3-21, 2020). An imprecise decline of almost 54, 49, 43, 37 and 31% was detailed in NAQI in the central, east, west, south and north areas of NCT Delhi separately. this unexpected thing the decrease in NAQI correlates with the change in concentrations of existing toxins; mainly PM10, PM2.5, NO2 and CO. However, after 2 weeks of closure, a slight increase in the NAQI was detailed on April 7 and 14, 2020 (Figs. 2h and 2i) due to the end of the essential minute of vehicle operation, thermal control plants and mechanical exercises. in towns in northern India.

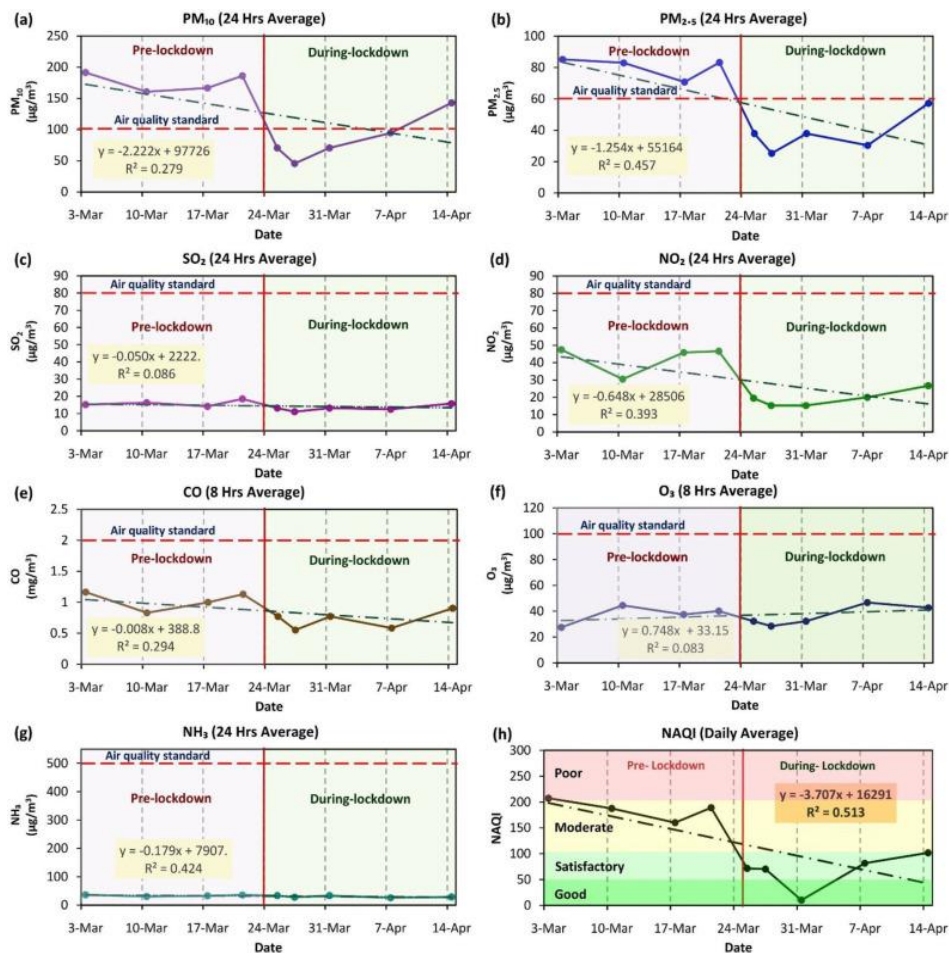


Fig. 1. Sources Google Scholar: 24h mean concentration; (a) PM10, (b) PM2.5, (c) CO, (d) NO2, (g) NH3, (h) NAQI and 8h mean of daily maxima of (e) CO and (f) O3 between 3rd of March and 14th of April,2020 (On 24th March 2020 the lockdown commenced) in NCT, Delhi, India

Table 1. Source Google-2020: Average concentrations and variations of criterion pollutants in NCT Delhi, India from 2 March to 21 March 2020 (before lockdown) and 25 March to 14 April (after lockdown)

Pollutant	Before Lockdown				After Lockdown				Overall variation Net	%
	NCT Delhi Avg	Industrial Location Avg.	Transport Location Avg	Residential And other Location Avg.	NCT Delhi Avg.	Industrial Location Avg.	Transport Location Avg.	Residential And other Location Avg.		
PM10	176.07	190.74	195.77	160.48	84.79	91.25	90.11	76.48	-91.2	-51
PM2.5	80.51	88.05	94.83	72.67	37.75	39.67	44.23	31.09	-42.7	-53
SO2	16.08	15.48	14.56	14.17	13.19	14.07	12.53	11.20	-2.89	-17
NO2	42.59	34.81	47.35	48.75	20.16	18.80	23.38	18.79	-22.4	-52
CO	1.03	1.33	1.13	1.01	0.72	1.04	0.71	0.64	-0.31	-30
O3	34.05	26.37	35.07	37.36	34.32	31.00	38.87	37.97	0.27	0.78
NH3	33.93	38.43	38.02	30.66	29.75	35.84	33.06	25.97	-4.18	-12
NAQI	185.99	196.38	215.29	174.78	72.64	92.45	87.29	79.80	-113	-60

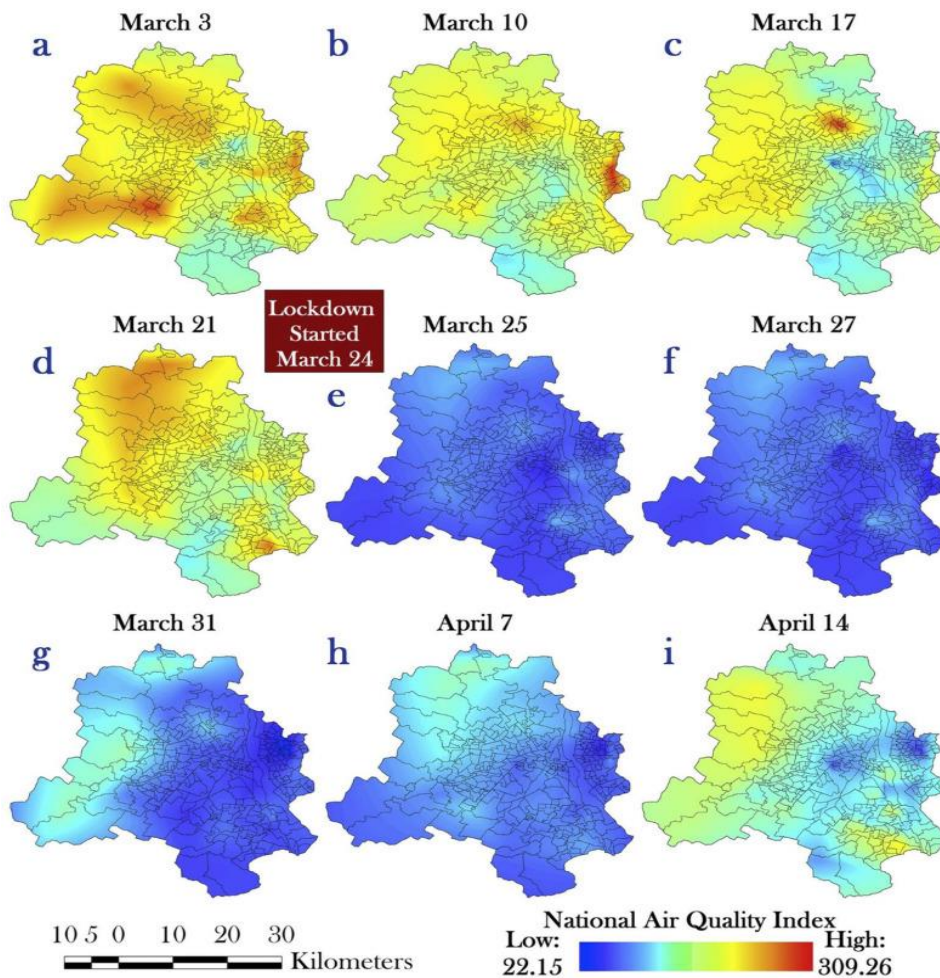


Fig. 2. Source Google open access: NAQI change at Delhi from 03 April to 14th of April 2020

4. AIR POLLUTION AMID DURING THE COVID-19 ACROSS THE WORLDWIDE

Fortunately, the containment measures provided an opportunity to rationalize man's natural positive effects in other parts of the world. There was a sharp drop in carbon emissions, as all the cube's posters, involved transport and other commercial foundations were closed. Compared to the information on the release of gaseous toxins last year, this can be expressed by the level of contamination discussed in Unused York, which has decreased by almost 50%. In China, reductions of nearly 30% in NO₂ and 25% in carbon emissions are detailed at the bottom of the block. According to the medium and its services, the quality of discussions in China changed by almost 11.4% compared to the information of the previous year. In Europe, NO₂ emission levels have dropped in northern Italy, Spain and the UK. In India, normal tropospheric

NO₂ concentrations during lockdown decreased by 12.10%. However, in 2019, Tropospheric NO₂ concentrations in India increased by 0.8% over the same period. The results show that NO₂ levels decreased due to important anthropogenic limitations of exercise. During the lockdown period, tropospheric NO₂ concentration in Delhi decreased by 65.90%. Studies have found a decrease in the number of poisons discussed in major cities around the world during the lockdown period. Ogeno et al. also indicated a strong relationship between NO₂ levels and COVID-19 death outcomes. Cocci et al. proposed comparable results regarding the discussion on quality, PM₁₀ and O₃ of the main cities of northern Italy. There are various other reports of changes in conversation quality during the COVID-19 outbreak, especially in different regions of the world. Fig. 3 research shows the quality of debate in some of the world's largest cities recently and post-COVID-19.



Fig. 3. Google Source: Covid Pandemic across worldwide [a] New Delhi, India, [b] Beijing, China, [c] Paris, France, [d] New York, USA

The European Space Organization (ESA) and the National Air transportation and Space Organization (NASA) distributed modern documentation that hinted the quality of natural progressed and NO₂ emanation turns down up to 30%. The NASA assemble information by making utilize of Ozone Observing Disobedient (OMI) on its Atmosphere fawning. In any case, utilizing the Tropospheric Observing Instrument (TROPOMI), ESA collected information through Sentinel-5P lackey.

5. INDIA AIR QUALITY INDEX AND HEALTH RISK

To clarify the overall air quality index (AQI) was measured as per the equation.

Air quality index (AQI) makes utilize of PM_{2.5}, PM₁₀, gases like SO₂₋₃, NO₂₋₃, NH₃, CO, O_{zone} and lead, of that was the least concentration of the 3 contaminants, at least one of them being calculated under the PM_{2.5} or PM₁₀. The concentration of toxins was changed over into numbers on a scale extending to the 500. For each poison (i), the sub-index AQI (AQI_i) was decided utilizing Eq. (1).

$$AQI_i = \frac{IN_{HI} - IN_{LO}}{B_{HI} - B_{LO}} + (C_i - B_{LO}) + IN_{LO} \quad \text{-----(1)}$$

$$RR_i = exp\beta_i(C_i - C_{I_0}), C_i > C_{I_0} \quad \text{----- (2)}$$

Where C_i is the concentration of impurity i, B_{LO} and B_{HI} are the concentration limits above and below C_i, and IN_{LO} and IN_{HI} are the corresponding AKI values. The overall air quality index is the highest AKI_i, and the corresponding air pollution is the most polluted air. AKI is divided into 5 different categories; Good (AKI range 0–50), normal (51–100), moderate (101–200), poor (201–300), poor (301–400) and severe (401–500). In India, the health benefits of multi-city commuting have been calculated based on multiple risk factors for indoor and outdoor air pollution. The relative risk of pollution is measured by Eq.

In the formula, RR_i is the relative density of pollutant i, and β_i is the response coefficient representing the additional health risk (eg death) that occurs when each unit of pollutant I exceeds a threshold value.

The β value was 0.038, PM₁₀, SO₂, NO₂ and O₃ were 0.32%, 0.081, 0.13 and 0.048 per μg/m³, and carbon monoxide was 3.7% per mg/m³. C_i, 0 is the concentration level indicating no health hazard when the concentration of pollutant I is equal to or equal to the maximum risk (ER) of pollutant I. The maximum risk of all pollutants is defined as follows. the equation is like this. (3), (4) is correct.

$$ER_I = RR_I - 1 \quad \text{----- (3)}$$

$$ER_{total} = \sum ER_I - \sum (RR_I - 1) \quad \text{-----(4)}$$

During the impasse, Sharma et al. (2020) examined the ER in response to air pollution and compared it to the same period over the past 3 years. The limit values for PM2.5, PM10, O3 are 25 µg/m3 (24 hour average), 50 µg/m3 (24 hour average), 100 µg/m3 (8 hour average) and 200 µg/m3 (1 - average hourly), to estimate NO2 and SO2 Organization, 2006). For CO, the air quality standards recommended by the Central Pollution Control Board (CPCB) use 4 mg/m3 (hourly average). In each region, the main health threats associated with PM2.5 and PM10 during the closed season were examined. However, PM reduced the mean ER in the country by an average of 52%. The ERs of all pollutants decreased during the shutdown in all regions except O3 in eastern India and SO2 in northern India. The overall reduction (about 4 times) of India's emergency services during the quarantine could prevent about 650,000 deaths per year in India.

6. PREDICTION OF THE METEOROLOGICAL IMPACT ON CONCENTRATIONS DURING COVID-19

Also, overall climate change may be due to greater pre-monsoon circulation during the lockdown. Similar blockades did not lead to significant changes in air quality in China due to bad weather. Two simulations were performed to demonstrate the effect. It was the study period of 2020 when real weather was used in Simulation 1. Worst weather for the first half of November 2019 was used in Simulation 2. Table 2 shows the performance standards for 30 urban research sites. Results showed that the mean most biased (MFB) results were within ±0.6 of the USEPA standard out of eight sites (Google Source). The relative concentration changes in simulation 2 compared to simulation 1 are also shown in Table 2.

In 24 directions the concentration increased due to unfavorable weather conditions. Under normal conditions, concentrations at sites with strong demonstration production increased by 33% in Revamp 2 compared to Revamp 1. This

indicates that it was not extreme weather, the daily PM2.5 concentration in Delhi-NKR increased to 54% which is below the CPCB standard (60 µg/m3) and 1.13 times higher than the corresponding WHO standard. In any case, this wave may not have the accuracy of the infection spot discussed in mid-November 2020. Because the same limitations are applied to anthropogenic teachings, since private emanations are primarily related to space heating in northern India.

Table 2. Google Source: Worst meteorological case reported in comparison to the base case at Delhi-NCR examinations sites

Station	MFB	Change [%]
Najafgarh	-0.10	-54.33
Narela	-0.70	-40.40
Okhla Phase-2	-0.40	12.97
Lodhi Road	0.00	28.19
Mandir Marg	-0.10	21.75
MDC National Stadium	0.10	33.29
North Campus, DU	0.80	-23.03
NSIT Dwarka	0.30	-43.13
CRRM Mathura Road	-0.90	17.62
ITO	0.40	154.64
IGI Airport [T3]	-0.40	-52.73
IHBAS, Dilshad Garden	-0.20	104.51
JLN Stadium	-0.90	04.04
Burari Crossing	-0.60	105.27
Punjabi Bagh	0.10	-21.10
Pusa	-0.40	29.37
R K Puram	0.10	-47.06
Sonia Vihar	-0.30	31.20
Vivek Vihar	-0.40	36.65
Wazirpur	0.60	268.75
Anand Vihar	-0.30	64.30
Ashok Viha	-0.10	71.32
Rohini	0.10	-48.35
Shadipur	-	12.31
	0.40	

7. WATER USAGE DURING THE COVID-19

Shorelines never end up one of the irreplaceable characteristic assets found in coastal regions. The assets advertised by the shorelines such as angling, discuss, arrive and relaxation are exceptionally vital to the survival of coastal people groups and have essential values that must be protected from abuse. On the other side,



Fig. 4. Google Source: Pictures of the beach mask

non-responsible utilization and non-civilization of the assets by people has influenced different world' shorelines that confront developing natural risks. The current coronavirus widespread has confined tourists' stream to these shorelines, coming about in exceptional change within the appearance of numerous world shorelines [9].

8. WASTE GENERATION AND RECYCLING DURING COVID-19 TIME

Land degradation and the deforestation, air and the water pollution are the environmental risks from the production of organic and inorganic waste. The World Health Organization declared the viral COVID-19 outbreak a state of emergency, forcing the people around the world to stay at home/present places not to roam. COVID-19 immediately spread too many countries around the world, the management of medical waste can be a major concern [10-13]. In order to properly dispose of medical waste, organizations and factories involved in waste management have put in place a plan to prevent the spread of the coronavirus. It is also important that the government find a solution to this problem. Everyone is responsible for complying with the rules and regulations during the disposal of masks and other medical waste. Personal protective equipment (PPE), such as gloves and masks, contributes to increasing waste in many developing countries. In the end, our world will

emerge stronger from this disease, and this can only be achieved with the collective knowledge and imagination of people. Certain members of society, such as domestic workers, garbage collectors, and others who tend to spend more time in public places, are at greater risk of exposure to medical waste. Plastic-based masks are liquid resistant and durable by man's activities but ends in the ocean after disposal.

These plastic masks, as well as surgical masks, sterile bottles and wipes, cause a lot of medical waste when thrown away. Environmental NGO Ocean Asia recently conducted research on Hong Kong's Soko Islands; many discarded masks were thrown and crashed into a 100-meter-long beach. During the COVID-19 outbreak, citizens are required to wear surgical masks as a precaution. The increase in the amount of waste caused by the daily use of masks, gloves and hand sanitizer by 7 million people worldwide would be a huge problem. Discussions about various medical waste products will be real in the coming days. The global COVID-19 pandemic is a global fiasco that, given its impact on humans, will create a huge waste that requires economic analysis. However, this reaction is not earth-shaking. "This is our next issue," Morris said after sharing a photo of a mask lying on the beach, but this is nothing new. Waste recycling is an important

ecological problem and worries all countries the most. It is an important way to control pollution, conserve natural resources and save energy.

9. NOISE POLLUTION LEVELS AMID COVID-19

Ambient sound is defined as an unwanted sound that can be artificially produced by high volume work (for example, commercial/industrial activities), the movement of the car engine, and music. It is one of the main reasons why it supports the environment, causes health problems and changes the conditions of the nature. Some countries have implemented isolation measures that keep people at home. However, the use of transportation has decreased significantly. International flights have been cancelled. The market is almost over. All outdoor sports such as cricket, basketball, football and hockey have been suspended. Stores and shops were closed. All schools were closed and private and public meetings were suspended. The city streets are mostly empty; Businesses, businesses, factories, bars and theaters were closed. All these changes have resulted in a reduction in noise levels in major cities around the world [14-19].

10. EMERGENCY RULES REGULATION [ERR] AMID COVID-19

-Working together to reduce human-to-human transmission of the coronavirus is critical to controlling the disease now. Social control is very effective in preventing the spread of the disease. Working from home will reduce social interaction. For people with little or no outdoor space, staying indoors can be more of a struggle. -Specific strategies and efforts should be implemented to protect vulnerable people, such as healthcare workers, children and the elderly. Patients with diabetes, heart disease and even high blood pressure, chronic respiratory disease and cancer are at risk of contracting the coronavirus. -A guide has been published for doctors, individuals and scientists interested in the coronavirus. Utilities require a variety of hand sanitizers every day. Larger families have a higher risk of bringing the virus home. -Travel screening can limit the disease and prevent its spread. Changes in the spread of the coronavirus should be monitored. It is important to consider human-to-human and subclinical transmission, adaptation, development and transmission of the disease and to understand the animal environment and owners. However, to date, only a small number

of patients have been reported due to the lack of clinical trials. -Color codes can be used to identify the true, low prevalence and prevalence of the disease in a country -Household waste should not be disposed of and stored outside to provide breeding grounds for flies and pests. Instead, it should be thrown into the hole. Appropriate protective equipment should be worn when using disinfectants. In these challenging situations, one must be a responsible citizen. - Online dating and shopping for medicine, vegetables, food, milk, etc. to prevent people from coming. Encourage delivery. Outdoor activities should be avoided. Religious activities should also be temporarily suspended to avoid large gatherings. Books, internet, etc. time must be spent. Overcome depression caused by blockages [20,21].

11. CONCLUSION

Due to the containment of the COVID-19 pandemic, the shutdown strategy provides a useful message for all countries around the world to restore the stability of the environment and ecosystems. Apparently, this unfortunate and deplorable situation has become a curse for millions of people as the global spread of COVID-19 and continued slaughterhouse closures face severe disruption to the global economy. The COVID-19 pandemic has led to improvements in environmental, water and sound quality. The measures taken by governments around the world in response to COVID-19 have reduced environmental pollution and improved environmental quality, especially in countries heavily affected by the COVID-19 epidemic, such as China, the United States, Italy and Spain. These countries have seen reductions in carbon emissions, air pollution and music. India is about -51.84, 53.11, -17.97, -52.68, -30, the concentration of PM10, PM2.5, SO₂, NO₂, CO, O₃ and NH₃ decreased by 35%, 0.78% and -12.33%, respectively. Significant improvements in air quality can have significant health benefits.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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