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Impact of Novel COVID-19 Lockdown on Global Environment

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Abstract From December 2019 to March 2020, Novel COVID-19 has spread in almost all countries throughout the world creating a havoc among the people. Lockdown as a solutions to it has been implemented worldwide to bring the situation under control. Lockdown can help to reduce the spread of Corona virus which in turn will reduce number of Novel COVID-19 cases and the toxic contamination of environment. As a result the reduction of all type of pollution will lead to decrease number of patient related to air borne diseases like measles, chickenpox tuberculosis, etc. The purpose of this review article is to explain the impact of one month lockdown on global environment.

Keywords: corona virus, Novel COVID-19, lockdown, pollution, global environment

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1. Introduction

As human interference with alternatives is increasing day by day leading to some adverse effect on both animals as well as humans. It won't be wrong if we say global warming and Novel COVID-19 are sets of examples facing the world. First case of Novel COVID-19 was observed in December 2019 from Wuhan in China. Novel COVID-19 is mainly spread due to close contact and by small droplets produced during coughing, sneezing or talking [1]. These small droplets may also be produced during exhalation leading to fall on the surface or ground. Corona virus generally does not spread through the air over large distances [2]. People may also get infected by touching a contaminated surface by hand or even other body part and subsequently placing the same contaminated hand/s or body part on their face. The World Health Organization (WHO) declared the outbreak to be a Public Health Emergency of International concern on 30th January, 2020 and recognized and declared it as a pandemic on 11th March 2020.

According to WHO guidelines to control the spread of Novel COVID-19, travel restrictions, quarantines, social distancing, curfews, workplace hazard controls which means lockdown, have been made in almost 200 countries. Lockdown was implemented in China from 23rd January, 2020 to 13th March 2020. Most of China will be located in Lockdown in the next few days [8]. Italy had the highest

number of deaths due to Novel Covid-19 in March 2020 and the lockdown period was extended in Italy from 9 March 2020 [4]. On an average lockdown was implemented in 200 countries for at least 25-30 days. This resulted in reducing of number of Novel COVID-19 cases. In China where first Novel COVID-19 case was detected life started to return to normal in about fifty days. But due to late decision of lockdown, the situation in other countries like US has become alarming. So far, the number of coronary cases in US has reached nearly about four lakh which has surpassed China.

Air pollution is a major problem of recent decades, which has a serious toxicological impact on human health and the environment. The sources of pollution vary from motor engines of automobiles and industrial activities [5,6]. Long term effects of air pollution on the onset of diseases such as respiratory infections and inflammations, cardiovascular dysfunctions, and cancer are widely accepted [7,8,9]. Hence, air pollution is linked with millions of death globally each year [10,11,12]. Across Europe, according to the European Environment Agency, an estimated 113 million people are affected by road traffic noise levels above 55 decibels. It's the threshold at which noise becomes harmful to human health by the WHO definition [13]. Some of the main sources of noise in residential areas include loud music, transportation (road traffic, rail, airplanes etc.), lawn care maintenance, construction, electrical generators, explosions, and people. Unwanted sound (noise) can damage physiological

health. Noise pollution is associated with several health conditions, including cardiovascular disorders, hypertension, high stress levels, hearing loss, sleep disturbances, other harmful and disturbing effects [14]. The organization Global Oceanic Environmental Survey (GOES) consider water pollution as one of the main environmental problems that can cause a danger for the existence of life on earth in the next decades. Lockdown will not only reduced the prevalence of Novel COVID-19 but also improved the quality of the weather and make the environment pollution free.

2. Methodology

In almost 95% of the world's countries lockdown has been observed from February 2020 to April 2020. Earlier, the world had faced similar situation with the spread of different viral infectious diseases like Spanish flu-1918, Swine flu-2009. Even though first case Novel COVID-19 was diagnosed in December 2019. Thereafter lockdown has begun in most countries since January 2020. This lead to rapid spread of the disease which has gone out of control and hence for the first time in the history of the world, entire world had to take drastic step of such a long duration lockdown.

Literature survey from various articles, research papers, and media was studied with respect to impact of lockdown due to Novel COVID-19 on the environment. The survey conveyed the message about the need of lockdown and how it will improve the environment which will be beneficial for the health of the society. It will help to inculcate preventive measures in the society as we know prevention is better than cure. This article provides a comparative study and summary of ideas of various research papers from research publications, newspapers and various television channels. The articles and survey shows how this situation can help us get clue to overcome other major international issue like pollution, global warming, etc.

3. Result and Discussion

Lockdown has had a significant impact on spread of Corona virus and Novel COVID-19. Lockdown has and had a significant impact on Corona virus and Novel COVID-19. During the lockdown, on an average a month in the world, airplanes, trains, only 5% of emergency services traffic was operational. Only emergency services were allowed to work. So almost 99 % of the world's polluted industrial area was shut down during the lockdown period. Nearly six billion people around the world stayed at home, thereby reducing environmental interference by people, as well as unfair activity. This helped the quality of air, water, and overall environment to improve further. Air is most important constituent of the environment in which increasing the amount of CO₂, CO, N_xO, hydrocarbon, SO₂, SO₃ and other gases in every year. The analysis builds on research published in September 2019 and confirms that calculation of 8.8 million early deaths a year from outdoor air pollution around the world but during the lockdown, the volume of waste gases, emitted gases dropped almost 10% lower this year compared to the year before. Because lockdown causes

the world to shut down for about more than a month. Therefore, the following will help to improve the quality of air, water, and overall environment by reducing the harmful effects of such gases.

1. Carbon dioxide gas (CO₂): CO₂ is naturally present in the air we breathe at a concentration of about 0.037% and is not harmful to health at low concentrations.

At concentration of Carbon dioxide does not only cause asphyxiation by hypoxia but also acts as a toxicant. At high concentrations, it has been showed to cause unconsciousness almost instantaneously and respiratory arrest within 1 min [14].

CO₂ is 1.5 times heavier than air and due to these characteristics explain why enclosed environments are vulnerable for CO₂ buildup, displacing oxygen from the area [15]. The term "Confined space hypoxia syndrome" has been proposed to describe confined space accidents occurring in water meter pits, tanks, holds of ships, mines, underground storage bins, and so forth, resulting from oxygen-deficient atmospheres [16,17]. Confined space hypoxia syndrome annually kills about 600-700 people in a country like the US. According to 2015 serve of Carbon Budget, 9,000-10,000 million metric tons of carbon dioxide annually emitted due to aircraft, trains and other transportation. That is, about 900-1,000 million metric tons carbon dioxide emission is going to decrease during lockdown. This can reduce the death toll caused by confined space hypoxia syndrome and also to some extent global warming.

2. Carbon monoxide gas (CO): CO is a toxic air pollutant produced largely from vehicle emissions. Breathing CO at high concentrations leads to reduced oxygen transport by hemoglobin, which has health effects that include impaired reaction timing, headaches, lightheadedness, nausea, vomiting, weakness, clouding of consciousness, coma and long enough exposure death. According to European Union Emission Inventory Report (2011), 22,000-40,000 million metric ton CO are emitted annually. During lockdown, CO levels have decreased by 220-400 millions metric tons.

3. Nitrogen oxide gases (N_xO): (N_xO) reacts with ammonia, moisture and other compounds to form nitric acid vapor and related particles. Small particles can penetrate deeply into sensitive lung tissue and damage it, causing premature death in extreme cases. Inhalation of such particles causes or worsens respiratory diseases, such as emphysema or bronchitis, and aggravates existing heart disease [18]. N_xO reacts with volatile organic compounds in the presence of sunlight to form Ozone. Ozone can cause adverse effects such as damage to lung tissue and reduction in lung function mostly in susceptible populations (children, elderly, and asthmatics). According to European Union Emission Inventory Report (2011), 800-900 million metric tons N_xO are emitted annually. During lockdown, N_xO levels have decreased by 80-90 million metric ton in European country.

4. Sulphur oxide gases (SO_x): 95% of the SO_x emitted from the combustion of fossil fuel is sulphur dioxide. SO_x is a toxic gas, which is directly harmful to human health. Even at lower levels, chest pains, breathing problems, eye irritation and a lowered resistance to heart and lung diseases can be experienced. Nearly 8,000-9,000 million metric ton of sulfur oxide gas is emitted from ships. During lockdown, SO_x levels have decreased by 800-900 million metric ton in European country.

5. Non Methane Volatile Organic Compound (NMVOC): Although NMVOC does not affect human health, they can cause global warming and air pollution. According to European Union Emission Inventory.

Report (2011), 6,000-7,000 million metric ton NMVOC are emitted annually. During lockdown, NMVOC levels have decreased by 600 - 700 million metric tons in European country.

6. Deforestation: Food and Agriculture Organization's 2016 State of the Forests Report, 3.5 billion to 7 billion trees are cut down per year. Lockdown has prevented about 0.3 billion - 0.7 billion trees from cutting.

7. Sedimentation: Over the years, many toxic chemicals have been released from the industry in rivers and oceans. This has led to a huge increase in water pollution and the water flora, microorganism, is also at risk for human health. During the lockdown the transport of the ocean as well as fishing was restricted. Therefore, the sedimentation process helps to settle down toxins, many constituents of water and impurities. Improved water level copy of rivers, seas and oceans.

8. Noise Pollution: Unwanted sound (noise) can damage physiological health. During the lockdown, reduced a total of 55 decibels of sounds generated due to aviation, railway, industries and road traffic closures.

9. Conclusion:

Gas	Reduced Quantity in Lockdown Period (million metric ton)	Gas	Reduced Quantity in Lockdown Period
CO ₂	900-1,000	CO	220-400
N _x O	80-90	SO _x	800-900
NMVOC	600 - 700	CFC	60-70

Activity	Reduced Quantity in Lockdown Period (billion)
Deforestation	0.3- 0.7 billion

Million of Corona virus affected patients have been found in the world. Majority cases have been detected in the United States. But lockdown for one month has reduced ratio of Novel COVID-19 cases and simultaneously has positively improved quality of air which in turn will help out to minimize additional worldwide issue like global warming. It is estimated that lockdown reduces the level of toxic gases in air, water and soil pollution by up to 10-12%. Widely implemented lockdown solution broken the Novel COVID-19 infection chain. The lockdown improved environment, biodiversity, ecosystem and to stop outbreak of viruses.

Implementation of periodical lockdown for a short span of time all over the world can overcome major issues like new

virus, global warming and help in making environment clean.

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