

Covid-19: Environmental and Social Changes during Lockdown

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Abstract- Coronavirus disease 2019 (COVID-19) is an infectious disease that causes respiratory illness in human and has now become a major challenge for all over the world. In spite of all their efforts to restore the nature during the last few decades, humans could only move a few steps forward. But during the last few months, consequences of the COVID-19 Pandemic have successfully recovered the environment to a large extent that should definitely set positive impact on global climate change. The COVID-19 spread around the world and severely affected the world's economy, education, social interactions and other global impacts. This review article describes the impact of COVID-19 on some environmental issues and segments of society.

Indexed Terms- COVID-19, Environment, Lockdown.

I. INTRODUCTION

The outbreak of the new coronavirus infection, COVID-19 (coronavirus disease 2019) was initiated from the Hunan seafood market in Wuhan, Hubei Province of China in December 2019. It is a communicable viral disease and quickly spread globally. So the World Health Organization (WHO) declared it as a pandemic on 11, March, 2020. It is caused by a single stranded RNA virus known as SARS-CoV-2 (severe acute respiratory syndrome coronavirus 2). Genomic analysis revealed that SARS-CoV-2 is phylogenetically related to severe acute respiratory syndrome-like (SARS-CoV like) bat viruses, bats could therefore be the possible primary source. Intermediate host for SARS-CoV is palm civet and camel. Although the intermediate source of origin and transfer to humans is not clearly known, but it is suppose that pangolin or snakes may be intermediate host for SARS-CoV-2. The reserve host for both is bat. Bat carries so many viruses and around 200 corona

viruses without getting sick. So the primary mode of transmission is from bats to intermediate host to humans.

The virus particles are spherical and have mushroom shaped protein called spikes protruding from their surface, giving the particle a crown like appearance. The spike binds to the human cell receptor called 'Angiotensin' converting enzyme 2. Studies showed that virus takes entry to the respiratory mucosa by Angiotensin receptor 2 (ACE₂) present in lower respiratory tract in abundance (Singhal, 2020) mainly in type-2 alveolar cells. The same receptor is used by SARS-CoV (Zhou *et al*, 2020). It has 10 to 20-fold higher binding affinity than SARS. Due to high binding affinity it transmit human to human very quickly (Ankita and Sangeeta, 2020).

The transmission of COVID-19 can be direct in the form of droplets produced during sneezing, coughing, speaking and accidentally inhaling the droplets in a closed proximity of an infected person. Droplets are water holding entities of diameter more than 5µm and these can be caught by a healthy person within a certain range of 1 m approximately. The indirect transmission is when virus is deposited on a dead surface like door bells, lift buttons, stairs, vegetables, fruits etc. which may come in contact with rest healthy persons frequently. From here the virus reaches to eyes, nose and mouth and finally leads to a new corona patient. Hence avoid touching your face frequently and wash your hands for 20 seconds under running water. Even fecal matter of infected person is found to be the transmitting source hence it can spread through fecal-oral transmission (Kumari and Shukla, 2020).

The period between exposure to virus and beginning of symptoms of the disease is known as incubation period, which is 1-14 days for COVID-19. Its common symptoms are fever, tiredness, and dry cough. Some

patients may have aches and pains, nasal congestion, runny nose, sore throat or diarrhea. These symptoms are usually mild and begin gradually. Some people become infected but don't develop any symptoms and don't feel unwell but these asymptomatic people are carrier of this virus. Most people (about 70 %) recover from the disease without needing special treatment. Around one out of every 6 people who get COVID-19 becomes seriously ill and develops difficulty in breathing. Older people, and those with underlying medical problems like high blood pressure, heart problems or diabetes, are more susceptible to this virus.

Most of these studies show that people who have recovered from infection have antibodies to the virus but there is no confirm evidence that people who have recovered from COVID-19 and have antibodies in their blood are protected from a second infection. However, some of these people have very low levels of neutralizing antibodies in their blood, suggesting that cellular immunity may also be critical for recovery. At this point in the pandemic, there is not enough evidence about the effectiveness of antibody-mediated immunity. Till now there is no report of any clinically approved antiviral drugs or vaccines that are effective against COVID-19. World was never prepared for this kind of pandemic, where we are in a race of developing a vaccine and its spread (Kumari and Shukla, 2020).

Anti-viral drugs like chloroquine and hydroxychloroquine have been found to be effective against COVID-19 in laboratory studies and *in-vivo* studies (Rolain *et al.*, 2007; WHO, 2020). A recent study revealed that remdesivir and chloroquine were highly effective in the control of 2019-nCoV *in vitro* (Wang *et al.*, 2020a, 2020b). Since SARS-CoV-2 is an RNA virus, any vaccines, effective against other RNA viruses such as measles, polio, encephalitis B and influenza, could be the most promising alternatives (Lu, 2020; Liu *et al.*, 2020). So, research will continue to play an important role to discover new drugs or vaccines to prevent and control the COVID-19 infections.

The novel corona virus has no border, no religion, beyond cast and creed. It is highly contagious in nature and unpredictable. The coronavirus outbreak is

severely disrupting the global economy, human health, environmental and social challenges. Almost all the nations are struggling to slow down the transmission of the disease by testing & treating patients, quarantining suspected persons through contact tracing, restricting large gatherings, maintaining complete or partial lock down etc (Chakraborty and Maity, 2020).

II. GLOBAL ENVIRONMENTAL ASPECT

From the beginning of civilization, human beings gradually started manipulating the nature for its own benefit. The desire to drive the nature as per their own whims and desire, human beings started destroying the nature in numerous ways. The climate change makes many existing diseases and conditions worse, but it may also help to introduce new pests and pathogens into new regions or communities. It is obvious that environmental pollution will change the distribution and burden of various vector borne infectious diseases including bacterial and viral diseases (Prakash, 2020). Due to lockdown, a large number of birds including vultures are clearly started to appear. Insect pollinators have appeared in abundance on crops and other plants. All these are good indication for ecological balance and biodiversity. Thus the most devastating and alarming situation of environmental changes before corona pandemic outbreak is ambition of man to become super power.

But, due to the unusual outbreak of COVID-19, almost every cities and villages in the affected countries is under partial or total lockdown for a long period of time. During lock down government closed all the school, colleges, non-essential business activity and transport like airplanes, rails, bus and private vehicle to avoid community transmission to restrict transmission of the SARS-CoV-2. These restrictions had an outstanding environmental effect by reducing the emission of greenhouse gases. Due to non-functioning of industries, industrial waste effluents and emission has decreased to a large extent, resulting in reducing the water and air pollution. Less vehicular movement, minimum activities in industries or factories and construction sectors improved air quality by leaps and bounds. As such, aviation emissions, which accounted for 2.4% of global CO₂ emissions in 2018, according to the Environmental and Energy

Study Institute (EESI) have dropped significantly. Even NASA satellites from outer-space show the significant reductions in air pollutants, which support Eco Watch's observation that the novel coronavirus pandemic has delivered the silver lining of decreased air pollution.

The Guardian added, "In China, the world's biggest source of carbon, emissions were down about 18% between early February and mid-March, a cut of 250m tones, equivalent to more than half the UK's annual output. Europe is forecast to see a reduction of around 390 m tones. Significant falls can also be expected in the US, where passenger vehicle traffic are the major source of CO₂, has fallen by nearly 40%.

China has witnessed a drastic reduction in emission of NO_x, CO₂ and various hydrocarbons during the coronavirus lockdown (2020) as compared to the values last year (2019). The areas of Eastern and Central China showed a significant reduction (10-30%) in NO₂ levels (Kulshrestha, 2020). According to Plumer and Popovich (2020), there is significant reduction in the air pollution in major cities of United State of America due to lockdown. The lockdown is a highly sustainable approach to reduce the noise and injection of tropospheric and stratospheric pollutants. That means the coronavirus crisis is so far "trigger the largest ever annual fall in CO₂ emissions in 2020, more than during any previous economic crisis or period of war." While this is encouraging news, experts say it still may not be adequate for meeting Paris Agreement goals to keep global warming from rising above 1.5 degrees Celsius.

Due to lesser demand of power in industries, use of fossil fuels or conventional energy sources have been lowered considerably. In many big cities the Inhabitants of metropolitan city and industrial area have been seen a clear sky and clear river water for the first time in their lives. After the lockdown, a variety of birds are seen in the localities. The pollution level in tourist spots such as forests, sea beaches, hill areas etc. is also reduced. Ozone layer is also reported to be healing.

Thus it can be concluded that-

- Transparent river water and clear sky in metropolitan cities clearly indicate that pollution

level definitely reduced to a great extent during lockdown. These reductions in pollution level help to flourishing the aquatic organisms including fishes.

- COVID-19 pandemic lockdown is pushing us to redefine our way of life, our cordial relation with nature and forcing us to adopt the law of nature. Nevertheless, this lockdown is allowing the planet to heal and rejuvenate the Earth, environment and human health system. The healing of earth and nature just hit the reset button on human life.
- Due to lockdown, the resources are being consumed in a limited manner. People have realized that their survival needs are very less but for status in the society they were wasting the resources. I would say that the lockdown is teaching us the practical lessons how to achieve the Sustainable Development Goals (SDGs).
- The best positive part of COVID-19 lockdown is that the climate and environment of Earth are going to be benefited for sure by restoring ozone layer and global warming.
- The lockdown therefore provided us an opportunity to shift our ideology from anthropocentric or human centric worldview to eco-centric worldview.

III. SOCIAL ENVIRONMENTAL ASPECT

The COVID-19 outbreak affects all segments of the society. The life during COVID-19 pandemic becomes upended. More than one quarter of the world's 7.8 billion people are now largely confined to their homes under government lockdown strategy to stop corona spread. In many parts of the world, borders are closed; airports, hotels, businesses and schools are shut down. These unprecedented measures are tearing at the social fabric of societies and disrupting many economics, resulting in mass job losses raising the spectra of widespread hunger. Pertinent to it, we are witnessing the pathetic condition of poor class particularly; daily wages and labourers are in severe crunch of daily livings and food itself. International Labour organization estimated that about 13 million people become unemployment all over the world due to COVID-19 pandemic. Financial insecurity, stress, and uncertainty have lead to increase in domestic violence and intimate partner violence aggression at home.

Thus COVID-19 pandemic has a catastrophic effect on employment.

As per the technology part the physical analogue would be being decimated, with traditional analogue businesses including hotels, restaurants and airplanes in crisis. The digital world, however, is thriving. This is the best phase application of digital technology. Everyone has been compelled to stay at home to combat corona and their window to the world is through their smartphone in hand. The digital technology will become more powerful and dominant as we could see that most of the countries try to use the surveillance to fight the virus. For instance, Government of India and Uttar Pradesh promoting to install 'Aarogya Setu' and 'Ayush Kavach-COVID' in smart phones to figure out who's been where in order to track clusters of the virus along with to provide up-to-date information regarding COVID-19 pandemic but at the same time, such moves threaten to undermine individual freedom and privacy.

Being forced to stay home and work from home has brought the family members together. They are forced to talk, eat and play together every day, which was not possible for some families due to work and various responsibilities when one was scheduled to go early and come back during odd hours when children were sleeping. It was heard sometimes that some of the children could meet their fathers weekly or fortnightly due to fathers over business. Stay home and work from home has forced us to opt alternate methods to keep engaged. One of the best methods is Yoga and meditation that increases the concentration, peace and confidence levels of mind gives and good health. There are number of online yoga classes given by an expert, which is proving the utilization of lockdown time fruitfully. Hence, the lockdown is good for family life and health if we change the mode of life (Kulshrestha, 2020).

The lockdown has interrupted the regular academic session. Primary and secondary school students are most affected because most of them are cut off from the academic interactions with their teachers. The disruption in education and learning could have medium and long-term consequences on the quality of education, though the efforts made by teachers, school administrations, local and national governments to

cope with the unprecedented circumstances of e-learning. In response to school closures, UNESCO recommended the use of distance learning programmes and open educational applications and platforms that schools and teachers can use to reach learners remotely and limit the disruption of education.

Several universities have asked their faculty to keep giving online classes and supplying reading material through emails. In a nutshell, for more mature students, the traditional class room education is turned into e-class room education system. I foresee it as a global turning point for adopting this new 'e-Education' system and 'Work from Home' cultures which are being endorsed by institutions and individuals.

The e-education will have impact on research and its procedures. During e-education, one cannot accumulate practical experience of real laboratory work like handling of apparatus and instruments etc. Hence, the degree holder of science by e-education will be useful only for teaching, online demonstrations, model creation, online material designing and modeling etc. Most colleges and universities will be deprived of good students and funds, which may result in abandoned physical campuses. My analysis is that the number of excellent research centers will be reduced, leading to reduced quality and quantity of formal research. However, the publications of traditional researchers will be less effective than the ideas given by a layman through online YouTube videos and Tik Tok platforms. Funding patterns for research as well as the priorities for future research areas will be changed.

Physical distancing develops a new habit of survival and new approach of interaction with nears and dears. It is really creating gaps between friends and relatives. However, the mobile phones and internet are keeping people close to each other. Slowly, people are adapting to stay home and develop new habits to keep themselves engaged in professional work vis-a-vis domestic work. Work from home has the following advantages-

- When you are at home every time, you take complete sleep, a basic need for good health and

peaceful working. It is believed that a good sleep enhances immunity.

- You save time of travel to office to and fro that gives you extra hours of working which means more efficiency and productivity. Secondly, you save fuel and help in controlling air pollution. Thirdly, there is no stress of travelling which means more efficiency.
- Yoga is the best methods for good health which rejuvenates our body in terms of enhancing our immunity system, concentration of mind and confidence levels. Spiritual development is essential for immunity, humanity and positive personality development.
- Numbers of Webinars, E- conferences, E-workshop are organized by different institutes, colleges, Universities and societies free of cost. These activities help to increase our knowledge and academics.

IV. PREVENTION AND CONTROL OF COVID-19

COVID-19 is a global threat that requires a global responsibility for providing exact information to save the human life from novel infection. To decrease the damage connected with COVID-19, public health and infection control actions are immediately necessary to limit the global spread of the virus. Till now there is no prescribed drug for treatment of COVID-19. Different approaches are used for different patients on the basis of severity. Four principles are important in patient management: “early recognition”, “early isolation”, “early diagnosis” and “early treatment” (Chen *et al.*, 2020). Primarily research indicates that the virus may remain viable on plastic and steel for up to three days but does not survive on cardboard for more than one day or on cooper for more than four hours and is inactivated by soap (Ankita and Sangeeta, 2020). As no drug is approved yet for COVID-19, it is recommended the following preventive measures to control the spreading of COVID-19-

- It is spread from person to person through direct contact so to prevent transmission restriction in mass gathering, hand hygiene, testing, isolation, quarantine of suspected and close related contacts and physical distancing are the primary preventive strategy for COVID-19 to save the public health.

- The people are strongly advised to avoid touching the face frequently and wash the hands for 20 seconds under running water. Social distancing and isolation or quarantine is the best way to prevent the infection.
- Coronaviruses are sensitive to heat (killed at 56⁰C for 30 min) and ultraviolet rays. These can be killed either, ethanol (75-80% concentrate), chlorine disinfectant, peracetic acid, chlorine and chloroform can effectively inactivate the virus, but not chlorhexidine.
- Avoiding close contact with people suffering from acute respiratory diseases, regular hand washing with soap and water or hand sanitizer particularly after direct contact with sick people or their environment, maintaining cough etiquette.
- Drugs like remdesivir, chloroquine and hydroxychloroquine have been found to be effective against COVID-19 in laboratory studies.
- Hydroxychloroquine has been recommended as chemoprophylaxis drug for use by asymptomatic healthcare workers managing COVID-19 cases and asymptomatic contacts of confirmed COVID-19 cases (Chen *et al.*, 2020).
- Homeopathy doctor’s recommended ‘Arsenic album 30’ at morning empty stomach for 3 days then repeated next month. They claim that this drug increase our immune power and also helpful in mild cases of COVID-19.
- Since SARS-CoV-2 is an RNA virus, any vaccines, effective against other RNA viruses such as measles, polio, encephalitis B and influenza, could be the most promising alternatives.
- Intravascular immune globulin, corticosteroids can be used in certain mild or moderate cases.
- For respiratory support, ventilation technique and hemo (dia) filtration / plasma exchange can be applied.
- Since, Yoga enhances the immunity, which is a need of the hour hence it should be exercised.

CONCLUSION

Thus from above discussion it can be concluded that whatever be the cause or origin of COVID-19 pandemic but its consequences have successfully recovered the environment to a large extent that should definitely set positive impact on global climate

change. Corona proves that although you are a superpower and have weapons that are capable to destroy the whole world but still if humans are creating mess with nature then even now nature is itself powerful to destroy humans with this small virus which is having very common symptoms like cold and cough. Like all the preceding disasters on the earth, let all be optimistic enough that, human beings will definitely win over the pandemic in due course of time, but they should know the limits to which they can thrust nature, before it is too late.

No need to worry about the future because time heals everything. If there are negative impacts so we have various positive things to learn from this. The COVID-19 has proved that Nature has provided us with all the resources for leading a beautiful life and she nourishes us like a mother, humans should respect and nurture her. Indiscriminate development and overexploitation of natural resources should be minimized at the level of sustainability. As a responsible human, it is our duty to protect our mother earth and nature and we must take corona outbreak as a wake-up call. We must follow the law of nature.

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