COVID-19 SECOND WAVE: CHALLENGES FOR SUSTAINABLE DEVELOPMENT

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Impact of Covid-19 Pandemic on Environment and Biodiversity

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ABSTRACT

The ongoing pandemic caused by COVID-19 virus has paralysed everyday life across the globe. To limit spread of infection, the Government of various countries issued a Nation-wide lockdown, with increase in COVID cases, more and more biomedical wastes were also produced. With a halt in manufacturing industries and automobiles plying, air pollution levels drops drastically and rare animal sightings were recorded by the media. Water Pollution levels were also recorded to be on the down trend.

Keywords: Covid-19, Environment, Biodiversity.

Introduction

The threat of a public health crisis in the form of a pandemic with the advent of the 2019 novel Corona Virus (2019-nCoV) also dubbed as SARS-CoV-2 has spread fast from its provenance in Wuhan City of Hubei Province of China to the entire world in a matter of weeks (Roy *et al.*, 2020; Roy and Chaube, 2021). The SARS-CoV-2 viral particles are spherical and have mushroom shaped protein called spikes protruding from their surface, giving the particle a crown like appearance (Kumari and Shukla, 2020). The spikes bind to the human cells and allowing virus to gain entry. The spike protein of novel corona virus shares 98% sequence identity with the spike protein of bat coronavirus. The researchers found that spike protein of SARS-CoV-2 binds to the cellular receptor called angiotensin converting enzyme 2, which is entry point into human cells (Verma and Prakash, 2020).

WHO released a pneumonia outbreak of unknown cause on January 5, 2020 and on February 11, 2020 named the disease COVID-19, which is caused by a coronavirus (WHO, 2020 a, b). The International Committee on Taxonomy of Viruses (ICTV) named it SARSCoV-2 on February 11, 2020 and recognized this virus as a sister clade to Severe acute respiratory syndrome coronaviruses (SARS-CoVs) (Alexander et al., 2020; Zhou *et al*., 2020; WHO, 2020 c).The SARS-CoV-2 virus causes this illness and belongs to the Genus Betacoronavirus of the Family Coronaviridae (ICTV, 2019). Initially cases of the infection were reported by the WHO China Country Office on December 31, 2019 with unknown etiology of pneumonia in Wuhan city, China (WHO, 2020 d).

As of December 13, 2020 there are 7,04,76,836 confirm cases that becomes double as of march 25, 2021 (WHO, 2020 e). Actual number of cases are not known but increasing cases becoming a challenge to human being. However, the vaccination has been started and is successful but it will take some moretime be completed. Since vaccination has not been completed, prevention is the best way to avoid COVID-19.

COVID-19 cases are much higher due to interhuman transmission in areas where social distancing is not maintained. The virus can infect through air, contact to the saliva or mucus of an infected person, fomite, fecal-oral, blood, mother to child, and animal to human and can enter the body through eyes, nose, or mouth. The infection can be reduced by protecting itself with some precautions as frequent hand wash, avoid touching hands to eyes, mouth & nose, maintain social distance and maintaining respiratory hygiene (WHO, 2020 f).

It infects mainly the respiratory system and cause mild to severe illness or even death. COVID-19 infection can

decrease the number of lymphocytes, white blood cells, and cause progressive respiratory failure owning to alveolar damage (Zhou *et al*., 2020). Common symptoms of COVID-19 are fever, tiredness, dry cough, aches and pain, sore throat, headache and sometimes diarrhoea, nausea or runny nose and in severe condition, difficulty or shortness of breathing, chest pain and pressure and loss of speech and movement (WHO, 2020 g). In recently reported cases patient losing their olfactory ability during the infection (Moein *et al*., 2020). The virus has three main mutant with named as clade G (variant of the spike protein SD614G), clade V (variant of the ORF3a coding protein NS3- G251), and clade S (variant ORF8-L84S) (Mercatelli and Giorgi, 2020).

In December 2020, a new variant of SARSCoV-2 "VOC 202012/01" has been identified from the United Kingdom. This new variant with 14 mutant has been reported in 31 other countries/territories/areas of the five WHO regions as of December 30, 2020 (WHO, 2020 g). This variant is more transmissible than previous with an estimated increase of between 40% and 70% in transmissibility (WHO, 2020 h). During the lockdown period, all unnecessary activities become shut to reduce gathering of peoples. It also helps to prevent the spreading of this virus by assisting people to avoid getting in contact with an infected individual and contaminated area. This helps to break the chain of SARS-CoV-2 infection and limit the infection in that area. It also helps to significantly reduce COVID-19 cases and to develop sufficient medical facilities such as infrastructure, medicine supply etc. in emergency cases.

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COVID-19 and Environment:

From the beginning of civilization, human beings gradually started manipulating the nature for its own benefit. In order to satisfy the demand of increasing population industrialization and urbanization became inevitable, and the obvious significance was proved to be detrimental on the global climate changes. The desire to drive the nature as per their own whims and desire, human beings started destroying the nature in numerous ways. As an inevitable consequence environment pollution has become a big issue of the present day. 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).

But, due to the unusual outbreak of COVID-19, all local and central administrations restricted the free movement of their citizens outside their home. Various industries are not functioning and all types of travels like airplanes, rails, bus and private vehicle are restricted or cancelled. Due to non-functioning of industries, industrial waste emission has decreased to a large extent. Vehicles are hardly found on the roads resulting almost zero emission of green-house gases and toxic tiny suspended particles to the environment. Minimal activity from industrial sites, factories and construction sectors has minimized the risks for toxins to escape, in turn improving air quality. As such, aviation emissions, which accounted for 2.4% of global CO_2 emissions in 2018, according to the Environmental and Energy Study Institute (EESI) have dropped significantly (Prakash and Srivastava, 2020). Even NASA satellites from outer-space show the significant reductions in air pollutants, which supports Eco Watch's observation that the novel coronavirus pandemic has delivered the silver lining of decreased air pollution.

Significant falls in carbon emission in China (18%) and in US (nearly40%) has been reported during lock down period. China has witnessed a drastic reduction in emission of NOx, CO_2 and various hydrocarbons during the coronavirus lockdown (2020) as compared to the values last year (2019). Eastern and central China areas showed a significant reduction (10-30%) in NO_2 levels (Kulshrestha, 2020). According to Plumer and Popovich (2020), lockdown due to COVID-19, significant reduction in the air pollution in major cities of United State of America. The lockdown is a highly sustainable approach to reduce the noise and injection of tropospheric and stratospheric pollutants.

Due to lesser demand of power in industries, use of fossil fuels or conventional energy sources have been lowered considerably. Ecosystems are being greatly recovered. In

many big cities the inhabitants are experiencing 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 shrinking largely. Ozone layer is also reported to be healing. The pandemic has displayed its contrasting consequence on human civilization, in the sense that, on one hand it has executed worldwide destruction, but created a very positive impact on the world environment on the other hand. Thus the lockdown act as a healing dose for climate change, ozone depletion, human health, brown haze etc.

COVID-19 and Biodiversity

Biodiversity refers to the existence of a wide variety of plant and animal species in their natural environments or the diversity of plant and animal life in a particular habitat (Ashok, 2016; Verma, 2017a; Prakash and Srivastava, 2019). Ecological balance is necessary for widespread biodiversity (Verma, 2017b). Biodiversity is necessary for the survival of all the organisms including humans (Ashok, 2017; Verma, 2018). Biodiversity loss has severe effect on ecsystem and sustainable development (Kumar and Verma, 2017; Verma, 2019). Nature always favours and promotes the diversity and coexistence among all the organisms by providing suitable environment to all. Human always try to control the environment and its own society in order to get conducive ambience. But due to overexploitation of natural resources, increased anthropogenic activities and human centric environmental approach, we are facing global warming and COVID-19 like unprecedented threats. So, we have to develop environment centric approach to utilize the natural resources in such a manner so that we can achieve the inclusive and sustainable development with coexistence of all other species of organisms of the globe. The lockdown therefore provided us an opportunity to shift our ideology from anthropocentric or human centric worldview to eco-centric worldview.

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. Almost total lockdown due to COVID-19 outbreak has minimized the anthropogenic activities including overexploitation of natural resources. The major human population is bound to live in th eir homes, automatically prevented to cause various types of pollution. The surrounding environment is reflecting clean and green. We all are observing a clean environment where almost all animals including birds etc. have stated to flourish. Almost all humans are feeling healthy without any major clinical problems.

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