

Practical 6

Writing blogs

Environmental effects of COVID-19 pandemic and potential strategies of sustainability

Abstract

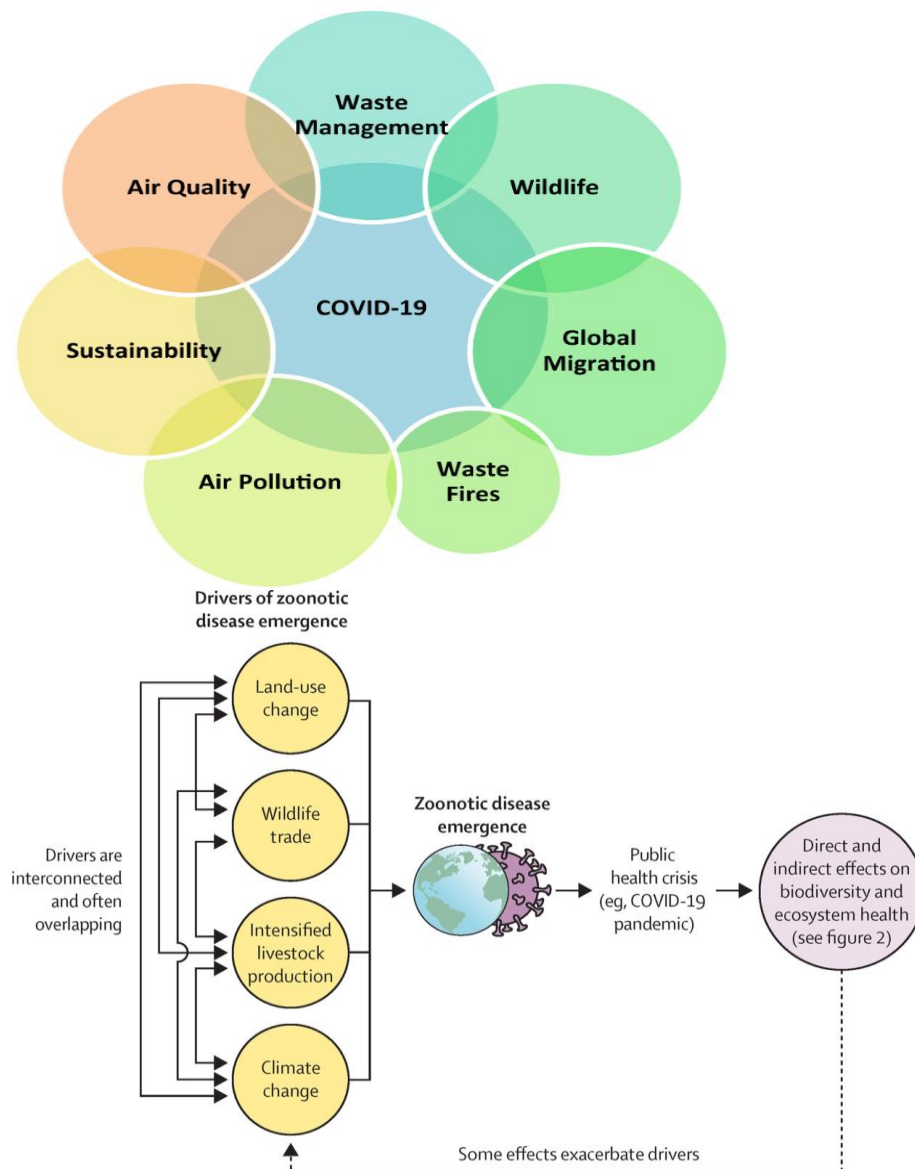
The global outbreak of coronavirus disease 2019 (COVID-19) is affecting every part of human lives, including the physical world. The measures taken to control the spread of the virus and the slowdown of economic activities have significant effects on the environment. Therefore, this study intends to explore the positive and negative environmental impacts of the COVID-19 pandemic, by reviewing the available scientific literatures. This study indicates that, the pandemic situation significantly improves air quality in different cities across the world, reduces GHGs emission, lessens water pollution and noise, and reduces the pressure on the tourist destinations, which may assist with the restoration of the ecological system. In addition, there are also some negative consequences of COVID-19, such as increase of medical waste, haphazard use and disposal of disinfectants, mask, and gloves; and burden of untreated wastes continuously endangering the environment. It seems that, economic activities will return soon after the pandemic,

Keywords: Environmental assessment, Environmental pollution, Environmental management, Environmental sustainability, COVID-19, Public health, Lockdown, GHGs emission, Biomedical waste

1. Introduction

The outbreak of coronavirus disease-2019 (COVID-19) first emerged at the end of December 2019, from the Hunan seafood market in Wuhan City of China, and declared as an international public health emergency in a couple of weeks by the World Health Organization ([WHO, 2020a](#)). It is an infectious disease caused by severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) ([Islam et al., 2020](#); [Nghiem et al., 2020](#); [Wang et al., 2020](#)). Genomic analysis revealed that SARS-CoV-2 is phylogenetically associated with SARS viruses, and bats could be the possible primary source ([Chakraborty and Maity, 2020](#)). Although the intermediate source of origin and transfer to humans is not clearly known, the rapid human to human transmission capability of this virus has been established ([Hui et al., 2020](#)). The transmission of the virus mainly occurred through person-to-person via direct contact or droplets produced by coughing, sneezing and talking ([Islam et al., 2020](#); [Li et al., 2020](#); [Wang et al., 2020](#)). As of September 06, 2020; the virus has claimed to spread 216 countries, areas or territories with the death of 876, 616 humans from 26,763,217 confirmed cases ([WHO, 2020a](#)), and the number is increasing

rapidly. The geographic distribution of COVID-19 cases ([Figure 1](#)), and the epidemic curve indicating the number of confirmed cases and deaths in different parts of the world are illustrated in [Figure 2](#).



Methodology

This study was performed by reviewing the available published literatures, case studies, and different government and non-government organizations information from reports and official websites. Scientific literatures were collected through electronic means from the database of Science Direct, Springer, PubMed, Tailor and Francis, ISI Web of Knowledge, Research Gate, and Google Scholar but not in a systematic manner. From a large number of studies, this study

compiles and presents the data and information which are relevant to the environmental effects of COVID-19 and meet the study goals.

Environmental effects of COVID-19

The global disruption caused by the COVID-19 has brought about several effects on the environment and climate. Due to movement restriction and a significant slowdown of social and economic activities, air quality has improved in many cities with a reduction in water pollution in different parts of the world. Besides, increased use of PPE (e.g., face mask, hand gloves etc.), their haphazard disposal, and generation of a huge amount of hospital waste has negative impacts on the environment. Both positive and negative environmental impacts of COVID-19 are present in [Figure 4](#).

Positive environmental effects

3.1.1. Reduction of air pollution and GHGs emission

As industries, transportation and companies have closed down, it has brought a sudden drop of greenhouse gases (GHGs) emissions. Compared with this time of last year, levels of air pollution in New York has reduced by nearly 50% because of measures taken to control the virus ([Henriques, 2020](#)). It was estimated that nearly 50% reduction of N₂O and CO occurred due to the shutdown of heavy industries in China ([Caine, 2020](#)). Also, emission of NO₂ is one of the key indicators of global economic activities, which indicates a sign of reduction in many countries (e.g., US, Canada, China, India, Italy, Brazil etc.) due to the recent shut down ([Biswal et al., 2020](#); [Ghosh, 2020](#); [Saadat et al., 2020](#); [Somani et al., 2020](#)). Usually, NO₂ is emitted from the burning of fossil fuels, 80% of which comes from motor vehicle exhaust ([USEPA,](#)

[2016](#)). It is reported that NO₂ causes acid rain with the interaction of O₂ and H₂O, and several respiratory diseases suffered by humans ([USEPA, 2016](#)). The European Environmental Agency (EEA) predicted that, because of the COVID-19 lockdown, NO₂ emission dropped from 30-60% in many European cities including Barcelona, Madrid, Milan, Rome and Paris ([EEA, 2020](#)). In the US NO₂ declined 25.5% during the COVID-19 period compared to previous years ([Berman and Edisu, 2020](#)). The level of NO₂ demonstrated a reduction across Ontario (Canada) and found to be reduced from 4.5 ppb to 1 ppb ([Adams, 2020](#)). Up to 54.3% decrease of NO₂ was observed in Sao Paulo of Brazil ([Nakada and Urban, 2020](#)). It was also stated that, the levels of NO₂ and PM_{2.5} reduced by almost 70% in Delhi, the capital of India ([Thiessen, 2020](#)). Overall, 46% and 50% reduction of PM_{2.5} and PM₁₀ respectively, was reported in India during the nationwide lockdown ([IEP, 2020](#)).