

## The Pandemic COVID-19 and its Positive Influences on the Environment

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### Abstract

The coronavirus disease (COVID-19) has emerged as the latest and serious public health threat throughout the world. In the absence of prevention and rehabilitation interventions, different countries have implemented shutdown and/or lockout policies to monitor the transmission of the epidemic, resulting of a significant reduction in anthropogenic activities. As a result, this kind of phenomenon is helped to inhibit the environmental degradation activity by reducing various pollutants from the air, water and soil. This condition provided 'a once-in-a-lifetime' chance for nature to evolve and recover. This paper discusses the nature of which in terms of its beneficial effect on water, air, the ozone layer, and waste deposition. Finally, the article also presents certain suggestive measures by highlighting the role of government, educational institutes, and a person as a whole in the sustenance of nature under pandemic. Based on the reported effect of the pandemic on the environment, it can be inferred that nature, with or without human intervention, can repair itself to some degree. However, human beings need to aware of saving and supporting to nature instead of involving in constant degradation.



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### Introduction


The fact that the pandemic COVID-19 has emerged as a "Jinx" for the year 2020 and 2021 needs no further elaboration. As of today (May 7<sup>th</sup> 2021), this disease has caused about 154,815,600 of morbidity with 3,236,104 mortalities throughout 223 countries.<sup>1</sup>

It is an infectious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-COV-2).<sup>2</sup> This disease spreads by small droplets produced during coughing, sneezing (droplets travel up to 4.5 meters or 15 feet, if coughing is uncovered) and during close contact with infectious person as

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well as direct exposure to any surfaces containing droplets.<sup>3,4,5</sup> Therefore, the WHO categorized COVID-19 outbreak as a pandemic on March 11<sup>th</sup> 2020. Thereupon each day is counting the increase in the number of COVID-19 cases as well as death rates. To comprehend such an infectious virus, the strategy of shut/lockdown was announced worldwide to break the disease chain.<sup>6</sup> As a result, streets and markets were left deserted. Industries, businesses, transport, flight, global conferences and gathering, sports, fashions and entrainment were all put to a halt. Shutting of shopping malls, theaters, pubs and all other palaces for recreation that attributes to the social gathering were pulled down to control COVID-19 spread.<sup>7</sup>

Meanwhile, as the world was coming up with this jinx, something unexpected or it can be said that something mankind had never conceptualized emerged on the surface with proofs hovering all over the social media. Due to substantial decline in the anthropogenic involvements, the nature has been shown the system of recovery such as peacocks dancing in Mumbai and coyotes on the street of San Francisco;<sup>8</sup> clearer water in Venice's Grand Canal, Italy;<sup>9</sup> healing of ozone layer.<sup>10</sup> Improvement in water quality and drop in air pollution has also been reported in many places throughout the world and all these are due to COVID-19. The said facts are partially true, which occurred not because of the disease, but instead due to worldwide lockdown, and reduced encroachment of humans and/or effects of human activities. Moreover, it was also estimated by earth system scientists that due to COVID-19 at least 77,000 lives may have saved over a few months.<sup>11</sup>

On the other side, as soon as the lockdown will end, people will revert to their old selves and routine and then, mankind will be back to pavilion with same old quality of water, air and life within the dark shadow of pollution. Hence this paper highlights some of the significant impact of COVID-19 on the environment with special reference to air quality, water quality, ozone layer depletion and status of solid waste materials. Further, some precautionary measures related to various aspects to maiming the normal or reducing the pollution statuses are suggested.

### Survey Methodology

The relevant literature search was done electronically by using Google Search Engine, Pub Med, Science

Direct and Frontiers Media data bases. The most importantly searched keywords were COVID-19, positive influences on environment, public health, air quality, water quality, ozone layer, waste disposal, waste disposal during corona pandemic, domestic waste, biomedical waste, plastic waste, suggestive measures, role of government organizations, role of educational institutions and role of a common man, which are placed repeatedly within the text.

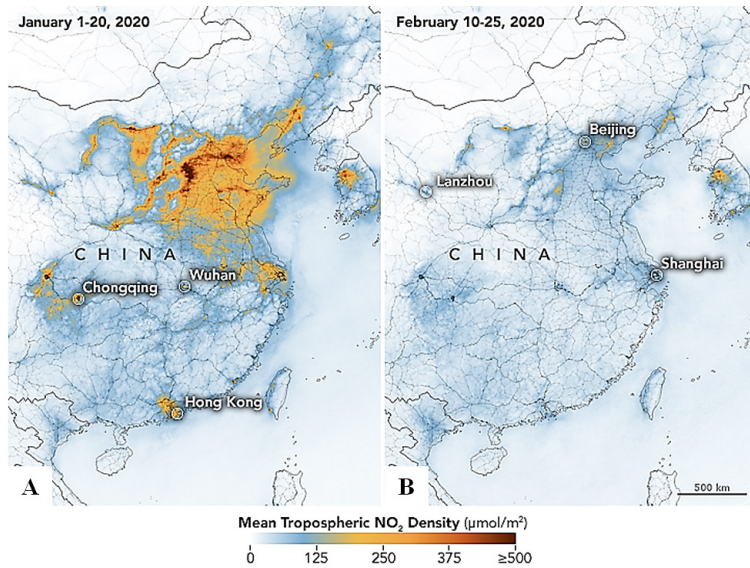
### Air Quality

For all living organisms on earth, air is one of the prime requirements that needs to be of optimum quality for healthy survival. However, pollution of air is adversely impacting all living organisms and now considered as the major concern globally. Although natural calamities like volcanic eruption and forest fires contribute pollutants in the air environment but the involvement of anthropogenic activities contributes substantially to air pollution.<sup>12</sup> The rapid growths of industrialization and urbanization have contributed maximum pollutants towards increasing air pollution. Moreover, the per capita energy consumption is yet another critical factor directly influencing the rate of air pollution. Due to our bewitched possession for industrial growth, our ecosystem has undergone diverse ramifications and diversion which is still continuing. The energy used for driving such system is mostly dominated by fossil fuels like coal, oil and natural gas which produces greenhouse gases are being considered as the major reason for climate change.<sup>13</sup>

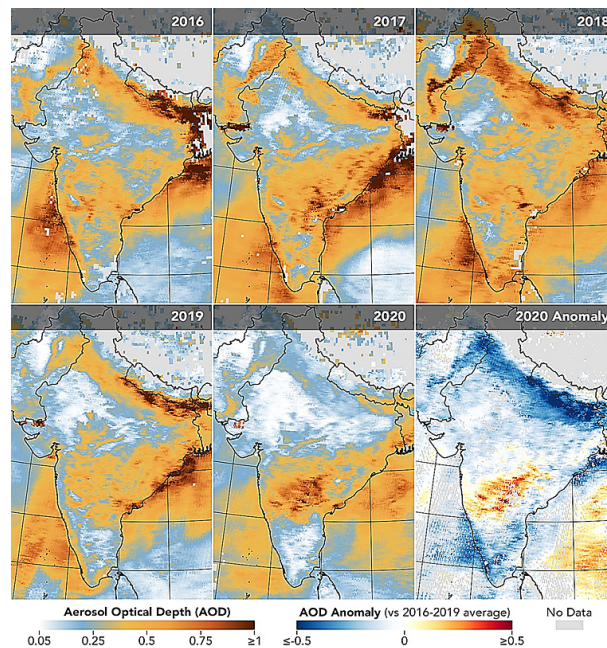
Carbon monoxide (CO), nitrogen oxides (NO<sub>x</sub>), particulate matters (PM<sub>2.5</sub>, PM<sub>10</sub>), sulfur dioxide (SO<sub>2</sub>) and heavy metals are some of the major air pollutants that directly or indirectly affect plant, animal and microbial kingdom as well as ultimately ecosystem in different ways. These pollutants cause serious human health hazards like irritation in eyes, nose throat, wheezing coughing, breathing difficulties, heart disorders and on longer term can cause cancer, neurological and even reproduction problems. Atmospheric CO<sub>2</sub> is the most dangerous greenhouse gas and its concentration has been increasing from 280 to 400 ppm with respect to the preindustrial era to present global scale.<sup>12,14,15</sup> Most recently, it is reported about the bad air quality of Delhi, India which is compared with smoking of six cigarettes per a day. Similarly, suffering from various air-borne diseases by the people of Wuhan, China is

also reported and confirmed due to inhaling of poor air.<sup>16</sup> Globally, the mortality rate due to air pollution in 2012 was around seven million.<sup>17</sup> Air pollution causes acid rain, aerosols production that affects the environment negatively. Oxides of nitrogen (NOx) are mostly responsible for haze formation (formed

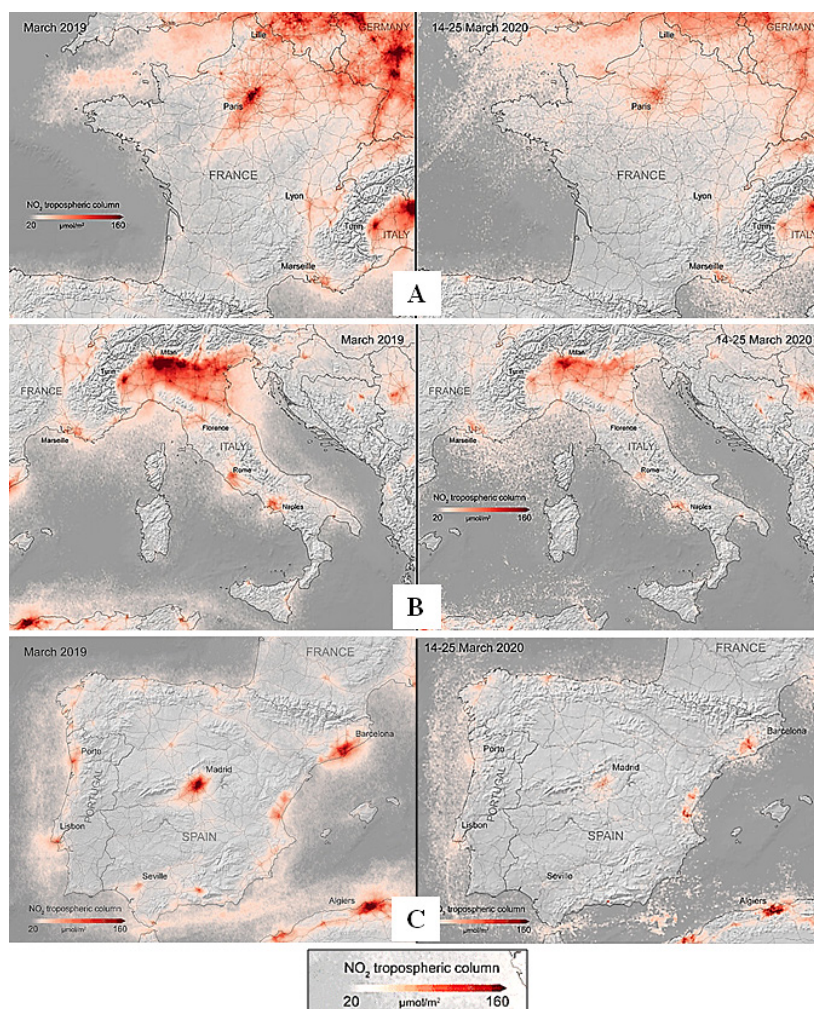
by fine suspended particles, smoke, and dust) that affects plant photosynthesis adversely. In Malaysia, it was reported during 2014 that the growth potential and the subsequent yield capacity of rice plant was reduced to half due to the NOx haze.<sup>18</sup>



**Fig. 1: Impact of COVID-19 lockdown on dramatic decline in airborne nitrogen dioxide over China. A: Before lockdown; B: during lockdown. Source: NASA, 2020.<sup>22</sup>**



**Fig. 2: Impact of COVID-19 lockdown on dramatic decline in airborne particle levels plummet in northern India. Source: NASA, 2020.<sup>23</sup>**



**Fig. 3: Impact of COVID-19 lockdown on dramatic decline in airborne nitrogen dioxide across Europe. A: France; B: Italy; C: Spain. Source: ESA, 2020.<sup>24</sup>**

The above fact of air pollution is recently improved due to worldwide lockdown. One of the largest drops in pollution levels could be seen in the city of Wuhan in Central China. Further, it was reported that a 25% reduction of emission in China is due to the reduction of the use of 40% coal at its largest six thermal power plants. According to the Ministry of Ecology and Environment in China quality of air had increased by 11.4% in 337 cities as compared with last year during the same time.<sup>19</sup> Significance decrease of CO<sub>2</sub> emission was also reported from New York with an average of 50% of reduction in pollution level.<sup>19</sup> According to the Central Pollution Control Board (CPCB), in India the reduction of air pollutants was observed which varied in different regions. The drastic reduction of aerosol values at the

Indo-Gangetic plain during the prevailing scenario of COVID pandemic was reported from Marshall space flight center in Huntsville, Alabama.<sup>20</sup> According to CPCB, India, the air quality index was moderate in Delhi during March 2020 with a sign of gradual improvements. Overall, there was up to 44% and 8% of reduction in PM<sub>10</sub> and PM<sub>2.5</sub>, respectively during the shutdown period due to COVID-19.<sup>21</sup> The signatory changes of air quality was also captured during lockdown period by National Aeronautics and Space Administration (NASA) and European Space Agency (ESA) from different countries of the world however, the dramatical changes of air pollutants from the top most populated countries like China, India as well as European regions are presented in figures 1-3.<sup>22,23,24</sup>

### Water Quality

Water is a vital fluid for the survival and is essential for natural systems like weather and climate. It covers over 70% of the earth's surface and makes up on average 60% of an adult's body weight.<sup>25</sup> Besides this, it also plays an important role in the economic development of any country like tourism, agriculture etc.<sup>26</sup> Water quality is affected by a wide range of natural and human activities resulting in disruption of the normal ecosystem. Industrial and sewage discharges in water bodies are one of the most polluting deeds of mankind that is worsening the quality of water. Physical, chemical and biological characters of water with respect to its suitability for purposes like drinking and bathing describes the quality of water and is usually measured by parameters like concentration of dissolved oxygen, pH, salinity, turbidity, quantity of pesticides, heavy metals and its concentration in aquatic biomass.<sup>27</sup> Nearly 80% of the world's untreated wastewater is dumped largely into the natural water channels causing severe deterioration of water quality throughout the world.<sup>28</sup> In 2016, the preliminary assessment of water quality was done in various rivers of Africa, Latin America and Asia and found that one-third of all rivers were now severely polluted with pathogenic pollutants, one-seventh were affected with organic pollution and one-tenth were both severe and moderate salinity pollution.<sup>29</sup>

WHO stated that at least two billion people drink water from feces contaminated source.<sup>30</sup> Algal blooms also originate from water pollution, which reduces oxygen level of water and leads to eutrophication, suffocating aquatic organisms and creates dead zones and also produces neurotoxins.<sup>28</sup> Increased level of nitrates in water is quite harmful to infants, causing "Blue baby syndrome" where their ability to deliver oxygen to tissue is reduced.<sup>31</sup> Heavy metals from industrial and municipal wastewater reduce the lifespan and reproduction ability of aquatic animals and also enter the food chain.<sup>28,32</sup> Heavy metals also affect photosynthesis by damaging the enzymes involved in chlorophyll production and also alter plant reproduction via a decrease in pollen and seed viability.<sup>31</sup>

During the lockdown due to COVID-19, there is a substantial decrease in disposal of industrial waste to water bodies and this has led to the improvement of the water quality. The whole world

was dumbfounded with the news of clean and clear water in the Grand Canal in Italy.<sup>33</sup> Similarly, in India, the scared and the most polluted river the Ganga turns cleaner.<sup>34</sup> The central pollution control board, India stated that out of 36 monitoring units placed at various points of the Ganga river, water quality of around 27 units were found to be suitable for bathing, fisheries and other aquatic living organisms.<sup>35</sup> As per the report documented in the Times Now, the water quality of river Ganga has improved to the extent of 40-50%.<sup>36</sup> On an average basis around 15.9% suspended particulate matter (SPM) reductions in Vembanad Lake (longest freshwater lake in India) during lockdown was observed.<sup>37</sup>

### Ozone Layer

Our earth has its own harmful ultraviolet (UV) rays-blocker known as ozone layer that protects all the living forms, thriving in its lap from harmful solar radiation. The layer is usually positioned at an atmospheric height between 10 to 50km from the surface of earth. Due to the relatively more reactivity, the ozone layer is more prone to broke down forming ozone hole.<sup>38,39</sup> Ozone hole is technically not a hole, instead it's an atmospheric region where no ozone is present or signifies the low concentration of O<sub>3</sub> is around 100 Dobson Units (DU) in a particular given area. The average concentration of O<sub>3</sub> over earth's surface is about 300DU (layer 3mm in thickness).<sup>40</sup> Formation of ozone hole is a seasonal phenomenon that occurs every year, caused by complex meteorological and chemical processes.<sup>41,42</sup> Ozone hole forms each year in the months of September, October and November over Antarctica region.<sup>38</sup> Similar holes are also present over the arctic region but it is smaller than the South Pole. Though ozone hole formation is a temporary natural phenomenon, chlorine and bromine released from synthetic compounds used by humans like CFC in refrigerator, air condition, aerosol propellants, electronic components, etc. are being considered as major contributors.<sup>43</sup>

Chlorine present in lower atmosphere remains stable for decades and after reaching the stratosphere it is stored in the form of hydrochloric acid and chlorine nitrate which in the month of polar darkness in the winter, in the presence of polar vortex (whirlpool of stratospheric wind with a temperature around -80°C) is converted into active forms. Thereafter, when sunlight returns to the pole, UV rapidly splits these

chlorine atoms into free chlorine that participates in reaction leading to the destruction of ozone molecule. Single chlorine atom destroys thousands of ozone molecules. Since the formation of ozone hole depends on polar stratospheric clouds and solar radiation, it is only seen in late winter or early spring.<sup>40,44</sup>

Attributable to ozone depletion, UV radiation especially UV-B radiation once passes in the lower atmosphere of earth have potentially harmful effects on human, animals, plants, and other living beings. It can cause skin cancer like basal & squamous cell carcinoma, malignant melanoma, serious sunburns and can also damage the cornea and lens of the eye. In aquatic systems, UV radiation affects the productivity and distribution of phytoplankton which forms the base of aquatic food webs. Also, planktons play a vital role in natural carbon cycle but a 6-12% of reduction in production of phytoplankton in the marginal ice zone due to increased UV-B disrupts this cycle. UV radiation also impairs larval development of aquatic animals.<sup>43,45,46</sup> Ozone depletion also causes damage to plants and crops, specifically; UV-B radiation reduces the quantum yield of photosystems in plants.<sup>47</sup> It also affects cyanobacteria residing in the roots of rice that retains nitrogen thus ultimately affect rice yield.<sup>48</sup> The radiation also influences biogeochemical cycles through altering the photobiological and photochemical processes in the environment.<sup>49</sup> Climate change is also related to ozone depletion in a way that ozone depleting substances (ODSs) like CFCs, HCFCs are also strong potent greenhouse gases and some of these are about 14,000 times more harmful than carbon dioxide.<sup>50</sup>

After successful enforcement of "Montreal Protocol" (an international agreement designed to protect the ozone layer) on January 1<sup>st</sup> 1989, the Antarctica ozone hole is slowly healing and this progress indicates that the ozone layer will be healed between 2050 and 2070.<sup>45</sup> Scientists also estimated that in the absence of "Montreal Protocol" there would have been 40% increase in the size of ozone hole by the year 2013.<sup>41</sup> In 2018 the world meteorological organization states that there is 1-3% per decade shrinkage in the Antarctic ozone hole since 2000.<sup>51</sup> So, the news that ozone layer is healing itself due to decrease in pollution level due to COVID-19 lockdown is controversial.

According to scientist of Copernicus Atmosphere Monitoring Service (CAMS), the smallest Antarctic ozone hole in the last 35 years closed in late November 2019. This could be due to sudden stratospheric warming over Antarctica leading to a warmer polar vortex than usual resulting in reduced ozone depletion. Similarly, CAMS also, announce on April 23<sup>rd</sup> 2020 that arctic ozone hole (rare when compared to Antarctica ozone hole) formed in the spring which was the largest till date was closed.<sup>51,52</sup> Scientists of CAMS said that this unusual ozone hole healing was not caused by human activity instead was the result of particularly strong Arctic polar vortex and its recovery is not due to reduction in pollution level during COVID-19 lockdown and its healing is also not related to any changes in the air quality.<sup>53</sup> So, prior to reduced pollution level in COVID-19 lockdown, already healing the ozone hole was and most of the credit goes to "Montreal Protocol" due to which global consumption of ODSs has been reduced by some 98% however, the impact of lockdown cannot be avoided.<sup>50</sup>

### Waste Disposal

In the rate in which the world is climbing the ladder towards growth and development, at an equal rate, it's leaving behind a huge dump of waste. Against the back drop of industrialization, urbanization and related anthropogenic activity, there is a rapid surge in waste generation throughout the globe causing alarming level air, water and soil pollution. This has necessitated urgent attention and action of environmentalist for the effective management of waste. Domestic, biomedical, industrial, and plastic wastes are the most common types of wastes generated at the present scenario. Simultaneously it is more alarming to note that around half of the populations of developing countries don't have the technical knowledge for proper waste disposal. Moreover, it was reported about 40-70% of discarded materials remain uncollected states as per the report of the World Bank.<sup>54</sup>

Most widely and commonly used method, land filling emits various air contaminants like methane which participates in global warming being a greenhouse gas. Increasing concentration of compounds like sulphate, cadmium, chlorides is reported to be found in water bodies near landfill sites, thus surpassing the standard value in drinking water.<sup>55</sup> Typically, in the case of biomedical waste disposal, incineration

is the most preferred method around the world and it leads to the emission of some persistent organic pollutants like dioxins and furans. These pollutants are recorded as cancer causing and hormonal imbalance substances in humans by the United States Environmental Protection Agency.<sup>56</sup> On top of this, illegal dumping of domestic waste paves the way for more environmental pollution. Frequently, waste from these dumping gets carried away into water bodies and causing the contamination. Disease and infection booming in these open landfill dumps are carried out by flies, mosquitoes, insects, rodents, cattle animals and other street animals in search of their food. Industrial wastes whether in the form of water, solid or air discharge also possess harmful effects on environment as they contain many toxic substances, heavy metals and chemicals.<sup>57</sup>

#### **Waste Disposal during Corona Pandemic**

In the present situation the moment corona pandemic, a major problem appeals for our attention regarding waste management. A number of data and findings suggest that the viability of coronavirus in environment from several hours to several days (surface dependent).<sup>58</sup> Therefore, it is alarming and urgent for its efficient disposal of waste and this is the reason why waste management should be proper so that secondary spread of this disease can be prevented.<sup>59</sup> Some of the concerns related to waste disposal during COVID-19 are as follows:

#### **Domestic Waste**

To break the chain of infection and to consequently reduce the burden on the hospitals, home isolation and quarantine are mostly being practiced all over the world. Migrants and patients with mild symptoms are advised to be at home quarantine. Many hotels and student hostels are also being temporarily converted to quarantine centers to address the pandemic pressure. A waste generated from such households meet the definition of clinical waste and can be contaminated with COVID-19 thus poses a problem for waste collection, handling and disposal.<sup>59</sup> Medical waste such as contaminated masks, gloves, used or expired medicine can easily become mixed with domestic waste.<sup>60</sup> Such waste also poses a threat to waste workers and rag pickers who troll through these wastes for their earnings.<sup>57</sup> According to the Association of Cities and Region for Sustainable Resource management, Europe is providing separate collection services to COVID-19

infected households and quarantine facilities to protect frontline waste workers and also ordered to transport such waste directly to landfills and for incineration without segregation.<sup>59</sup> Italy has banned all the infected houses from segregation of their wastes. Even recycling of wastes has been stopped in some cities of USA to prevent the risk of spreading COVID-19 in recycling centers.<sup>61</sup> Such action is likely to create an unwanted situation of piling up of waste and posing on environmental concern.

#### **Biomedical Waste**

In recent decade biomedical wastes has been a great concern and move more numbers during this pandemic. As most of the healthcare centers, hospitals are situated in cities closer to residential zones;<sup>57</sup> biomedical waste must be managed effectively and cautiously. Between 75-90% of the waste generated by healthcare facilities is non-infectious general waste when compared to domestic waste.<sup>62</sup> But in present situation of pandemic, it is mostly infectious due to the nature of persistence and mode of transmission of COVID-19. Due to increase in COVID-19 cases, biomedical waste production has also been increased tremendously, for an example; Wuhan city has produced an average of 240 metric tons of medical waste per day during COVID-19 when compared to their previous medical waste production which was fewer than 50 tons.<sup>61</sup> In developing countries risk of spreading COVID-19 is increased due to increased use and inadequate handling of PPE by common people.<sup>60</sup> Many countries still facing problems during biomedical waste management due to financial and technological challenges. Additionally, due to lack of awareness, proper training of individuals on duty most of the time this can lead to informal dumping as common practice. There is strong evidence of the transmission of infectious diseases through biomedical wastes. Under this circumstance of inappropriate waste management, this waste can relocate itself into nearby water bodies and thus could lead to an epidemic of water born disease and influence the increase of multiple drug resistance pathogens in communal water supply.<sup>57</sup> According to an assessment of waste generation rate data from around the world, about 0.5 kg per bed per day of biomedical waste is produced in hospitals.<sup>62</sup> After considering all this and for ensuring safe public health, proper biomedical waste management is of a great significance.

### Plastic Waste

With the spread of COVID-19 throughout the world, demand and use of single use plastic both for hygiene and convenience is also hiking. Already in the past, management of plastic waste was one of the major concerns and now it is overwhelming the prevailing waste management system and its capacity even more. The worldwide lockdown has forced the people to shop online for their basic needs like food which are mostly packed in plastic bags or plastic containers.<sup>61</sup> Bottle used as sanitizers, one-time used bags, cups and containers, packaging materials being used during this period to fight against infection are of major concern with respect to the environment. Plastic being versatile and cost effective material is used in diverse forms in health sectors such as packaging for medical instruments and medicines, IV bags, disposable syringes, masks, gloves, catheter tubes etc. have now increased due to rising cases of COVID-19.<sup>63</sup> As this virus can survive up to 2-3 days on a plastic surfaces,<sup>60</sup> henceforth the generation of plastic wastes is a challenging factor both for their proper disposal as well as the involvement in spreading of disease at the secondary level.

Plastic severely affects the environment as it remains persistent in environment for decades without degrading.<sup>63</sup> It renders the land unfit for any other uses if dumped in landfills. A very large number of plastics (about 3-5 million tons per year) are being dumped in the marine system which is hazardous for marine species.<sup>64</sup> About 260 species of invertebrate, turtles, mammals, seabirds, fishes are found to be affected, either they are entangled or they ingest plastic which leads to impaired movement and feeding, lacerations, ulcers, reduced reproductive output and death.<sup>65</sup> On the other hand, in the name of hygiene and precaution, plastic industries are going against the banning of single use plastic bags and this is more of a dangerous attitude towards the environment than being opportunistic.<sup>66</sup> So, there is an urgent need to check the rise in plastic waste and also its safe disposal.

### Suggestive Measures

Although greenhouse gas emissions have dropped and the quality of water and air has improved, still COVID-19 cannot be considered as a boon or silver lining for the environment. Along with some temporary positive effects COVID-19 has raised

some critical glitches especially waste disposal management which is more serious and critical to deal with in the long run and their impacts are upsetting. At present we have to fight at two frontiers, first to maintain this reduced level of pollution and secondly proper waste disposal and management to prevent infection at the secondary level.

To achieve this, already government, different environmental organization and educational institutes are doing their part but still, there is a need to do more and to channelize the efforts in the right track. Apart from this, each and every individual must gird up and must understand their duties for the environment. We all have to stream our joint efforts towards this goal and some of the measures are discussed below.

### Role of Government Organizations

To manage waste and plastic waste generation, the government must make sure that the waste management services like recycling, treatment and disposal should not be disrupted at any cost. Government should try to increase the capacity of recycling stations, establish effective sterilization centers and especially buffer storage of recyclables. During the pandemic of this kind, to deal with plastic waste in the form of PPE, the government must encourage and try to find the better solution in the work going on in the field of manufacturing reusable PPE kit. Most recently, India based company "Sure Safety" has designed the reusable PPE kit to combat the pandemic situation.<sup>67,68</sup> UV sterilization of PPE kit for reuse should also be considered by the government from various parts of the world which provides a positive thinking of environment.<sup>69</sup> Since dumping and incineration of plastic is not very good for environment, the implementation of various degradation strategies through genetically engineered microbes is effectively managed.<sup>70,71,72</sup> Meanwhile, the government must strictly adhere for wide application of paper or biodegradable bags.

To reduce air pollution and ozone depletion many countries have already implemented carbon tax and this must be continued. To reduce ozone depleting substance (ODSs) already "Montreal Protocol" has been implemented successfully with good outcomes in reducing ODS.<sup>73</sup> Governmental policies regarding pollution control are needed to



be regulated regularly with a goal to reduce large scale industrial emissions. Some technologies like pollution eating nanoparticles and use of filters at the source point of emissions must be mandated for every industry by the government to reduce air as well as water pollution.<sup>74</sup> Government should launch and encourage the use of biofuels (biodiesel, bioethanol), green vehicles (electric vehicles, plug-in hybrid vehicle, etc.) and use of renewable energy in manufacturing sectors. Government should be stern regarding issuing licenses for wastewater disposal by any industries. The use of microbes and fungi for cleaning up of heavy metals and organic compounds from wastewater before discharging into water bodies must be considered and priority must be given. Government must seriously perform monitoring programmes and studies to check on the pollution and must regularly make amendments in action plans, strategies and policies regarding pollution control and also ensures its successful implementation at ground level.

#### **Role of Educational Institutions**

Educational institutes are one of the important pillars in the establishment of a healthy environment with their awareness programs as they deal with the young and creative minds of any country that plays a very crucial part in development and growth of society. So, if change our society is the concern or their point of view, it is necessary to first mold the young generation by educating them about environment and how to protect it. The educational institute must mold them to go green, think green and stay green.

Educational institutes should help aware common people about environment and also must take responsibilities to help nearby population practicing different techniques and process like disposal criteria of different category of wastes, recycling of wastes, organic farming, biogas plants, and etc. Students must be practically educated to check about the information of environmental impacts of each consumable item that they are using in their daily uses. One of such efforts is "The Household Products Database" which has information about potential health effect, safety and handling of various household products basically designed for the knowledge of researchers and consumers.<sup>75</sup> So,

educational institute should join their hands together with either state or central government to make healthy and prosperous environment.

#### **Role of a Common Man**

Each of us having a direct link towards the society and the whole world can change if we put a little effort to save our surrounding environment. For a big variation, one has to first change himself or herself, then automatically this tendency will help for developing the whole world. As a common man, we have to play some important roles in order to save our environment and help to reduce the pollution by simply changing our lifestyle and consumption pattern. Some of common concerns like use of carpool, public transport and bicycle for transportation are very simple practices which not only save fuel energy but also help less deposition of pollutants to the air environment. Similarly use of biofertilizers, biological insecticides, pesticides and organic farming are helping to create great impact in reducing of soil as well as water pollution. During purchasing of any home appliances or office equipment, energy star label must be considered and these kinds of wise practices will promote for the reduction of ODSs and consumption of more energy. Self-awareness like shut down of vehicles at traffic signal which will reduce unnecessary wastage of fuel as well as air pollutants. Moreover, the recyclable wastes should be recycled and segregation of waste should be done at the site of generation which will be helpful during waste management. Especially during this pandemic each and every individual must follow the guideline of government while disposing of any household wastes. People must discard the used masks and gloves as per the instructions by keeping them in one box and pack them to prevent scattering and must be handed over to the proper discard agency or personnel on duty. In addition, limiting the use of plastic until it is highly necessary is one more practices which will definitely help for better environment. Other than these small changes in our lifestyle, forming a small communities or groups at society level with an aim to protect environment and aware of others is of great benefit. One must pledge to cooperate with the government in order to save our environment and progress towards sustainable continuous improvement.

### Conclusion

Finally, it can be said that COVID-19 has its greatest impact on health, social, economic and cultural activities around the world, which requires no further explanation. But on the other hand, the regulated anthropogenic activities during the pandemic period have helped our environmental scenario to blossom it's around and awakened the man, shows the amelioration the right path for caring for the environment and a prerequisite for global sustainable development. Further, some precautionary majors related to various aspects to maintain the normal or reducing the pollution status are also suggested. If these suggestions were practiced, would be beneficial both for mankind and nature. In summary, COVID-19 has taught humanity to make certain possible changes in order to minimize the negative effects on nature. Lastly, it is preferable to respond to the changes that nature

has bestowed upon humans and coexist, since it is apparent that nature will still find a way to live even without human assistance.

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### Conflict of Interest

The authors do not have any conflict of interest.

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