

Contextualizing the Impacts of COVID-19 in Bangladesh: An Evidence from Social and Environmental Perspective

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Abstract: COVID-19 has spotted profound concerns over time in Bangladesh as the country is known as a developing country though it has lower HDI. This densely populated country is facing various fundamental problems caused by the spreading of Coronavirus. One of the most difficult challenges is to ensure social distancing, while the environmental impacts of COVID-19 wastages need foresight to be taken care of. Another environmental impact of COVID-19 is rather positively accepted that the pollution rate dropped greatly for a while due to lockdown, but it was knowingly temporary as people tend to not follow the pandemic situation. Social distancing and health protective instructions are moderately followed by different classes of people from different socio-economic levels. Changes in social norms and family rituals to avoid the infection are noticeable. The importance of digitalization has increased during this pandemic; people are being dependent on various social media and digital communication apps for education, work and social belongingness. Telecommunication and digital media sectors are contributing to build awareness about Coronavirus among people. Due to the economic impact, Bangladesh is undergoing a social transition. Skyrocketing unemployment, limited sources of daily supplies, problems in digital schooling of children, lack of social security, emergency aids for the vulnerable possess great concerns. Initially the Government distributed 0.2 million PPE to the doctors and medical staff, but the management of these PPE wastages are neglected which possesses great health and environmental threats. Air pollution in major cities was deducted to a great level which did not happen for many decades whereas demand for proper water supply has increased. Many organizations are working alongside the Bangladesh Government for ensuring social distancing as well as distributing relief aids to the vulnerable group. Local authorities and voluntary workers are trying to deliver essential supplies in the lockdown areas. People now are conscious about cleanliness and management of wastages which boosted environmental benefits.

Keywords: Social Impacts, Environmental Impacts, COVID-19, Bangladesh

1. Introduction

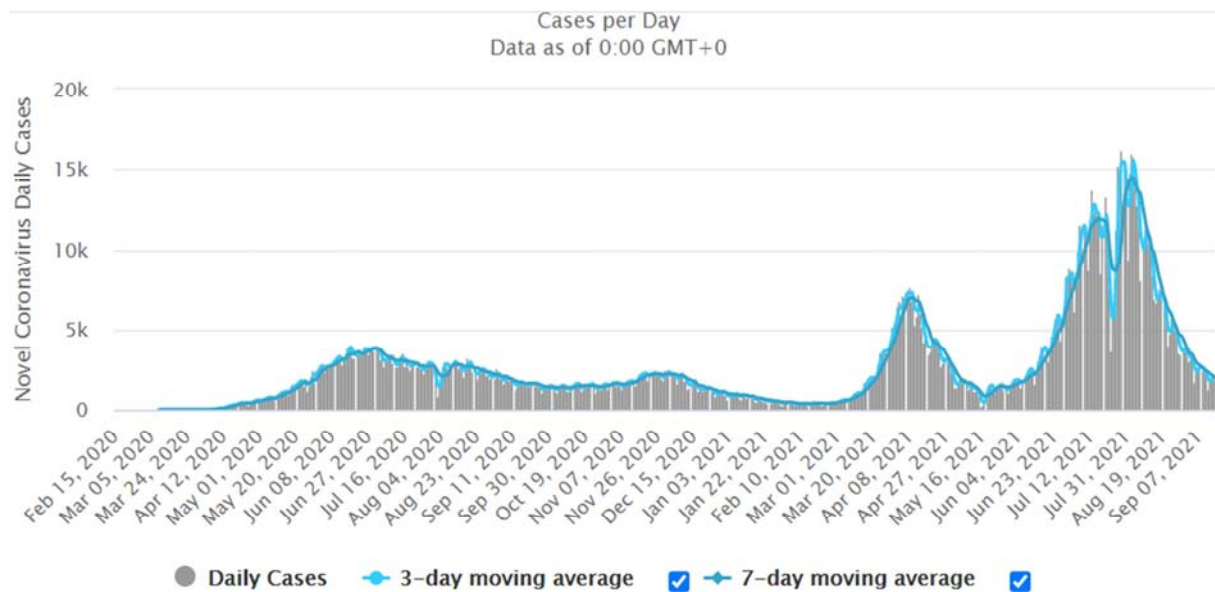
Novel Coronavirus Disease or COVID-19, a deadly super-contagious disease causing the pandemic in 2020 and forcing to stop all aspects of the economy worldwide, has been having severe effects on every society in almost every country and making sustainable environmental development more challenging from the resilience of ongoing medical wastages pollution. Many economies have been facing

challenging times; Bangladesh is no exception. The COVID-19 pandemic in Bangladesh is part of the worldwide pandemic of coronavirus disease 2019 (COVID-19) and was caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) at first. Later in 2021, the Lambda variant of CoV-19 and West Bengal variant were detected in patients' body, it was confirmed that those variants were spreaded from Bangladesh-India border areas.

On 8 March 2020, by the country's epidemiology institute,

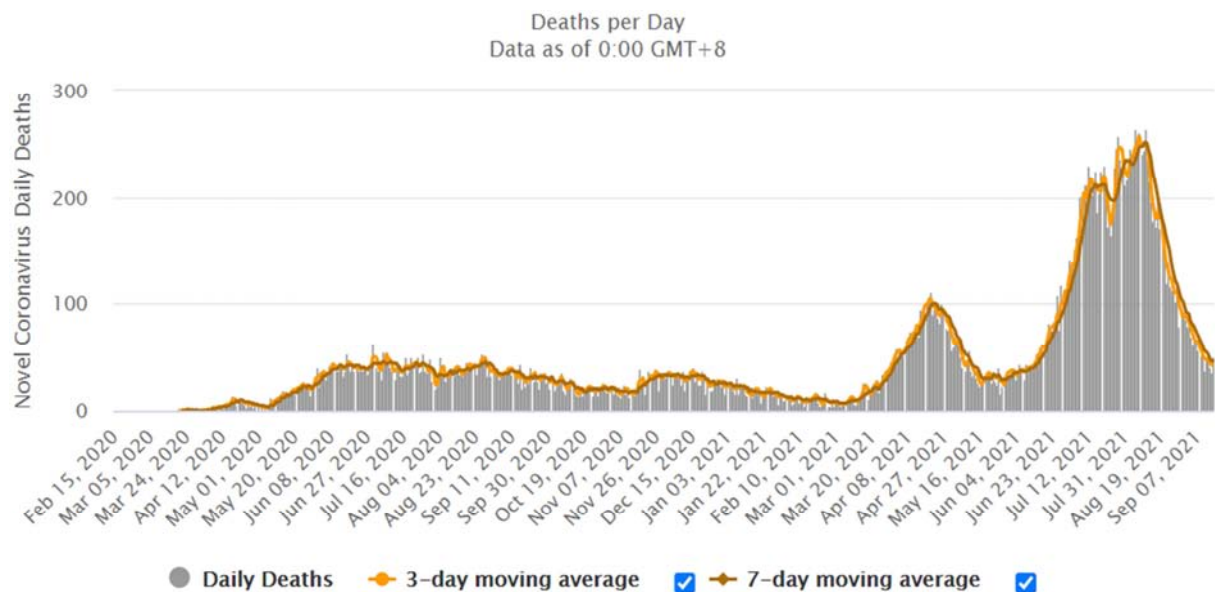
IEDCR, The first three known cases were reported. Since then, the pandemic has been spreading day by day over the whole nation with the number of people affected increasing. The government declared a "lockdown" throughout the

nation from 23 March to 30 May in order to protect the population, and prepared some necessary steps to spread awareness to keep this syndrome away from them.



Source: Daily 2,006 Cases on 7-days moving average – Worldometer, Last updated: September 15, 2021, 00:00 GMT+8

Figure 1. Novel Coronavirus Daily Cases Trend.



Source: Bangladesh Coronavirus: 46 Deaths on 7-days moving average – Worldometer, Last updated: September 15, 2021, 00:00 GMT+8

Figure 2. Novel Coronavirus Daily Deaths Cases Trend.

Though infections remained low until the end of March, it saw a steep rise in April. In the week ending on 11 April, new cases in Bangladesh grew by 1,155 percent, the highest in Asia, ahead of Indonesia, with 186 percent. This highest steeping rise of COVID-19 affected people in Asia expresses that Bangladesh had very susceptible groups of victims as a lower-middle income third world country. This not-ending-soon pandemic crashed the society, which already has inequality at its top in all of its classes, with great impacts.

Also, more environmental concern has been created as the daily doubling of a huge amount of plastic-based medical wastages can make the situation in the case of environmental resilience more challenging in the long-run if not taken care of well. These circulating social and environmental problems created by COVID-19 pandemic have their great impacts but Bangladesh has also many interesting positive resilience coming from the government and the citizens. The social and environmental impacts are now important to study to work

on the effective resilience programs and efficient policy making with the country's very limited resources to fight against the pandemic and make the economy and the land survive.

2. Social Dimensions

The social impacts of COVID-19 pandemic have many dimensions in the sphere of social life of Bangladesh. Being a newborn middle-income country with its different norms and customs in the society, Bangladesh had unimaginably high and low key impacts in the societal era. The impacts of slowing down the economy and lockdown (general holidays) were psychologically vital among all social classes. Fear, anxiety, mistrust in societies, stress were speeded among people after the news of first confirmed cases of death due to COVID-19. During such times, where emotional balance can go for a toss, parent and peer relationships can matter a lot [1]. Further, there is a high chance of people developing psychological stress and disorders like depression, insomnia, anxiety, anger, boredom, etc. [2]. After a while people started helping each other and were ready to fight the situation with positive attitudes. People's social behavior also had notable varieties of changes, from the high to the low notes.

2.1. Psychological Impacts

2.1.1. Fear, Stress and Mistrust in Societies

The COVID-19 pandemic had a strong impact on people's mind and led it to immeasurable fear as there has been no news of success in the invention of any vaccines or medicines. Fear of losing jobs and income had to arise as these have been happening on a great scale due to lockdown situations in Bangladesh. Employees of corporate level have been facing the stress of extra work volume along with maintaining the extra hygiene to prevent any infections from spreading.

In Bangladesh, there are many cases of fearing one's neighbor, fear of affliction by one's neighbor have been watched. Distrust of quarantine facilities provided by the Government was recorded in many cases. Across the nation, people have been fearful of those coming from another country where COVID-19 has speeded. People are also distrusting those who have come from COVID-19 hotspots. In fact, accommodation facilities of tenant doctors, nurses and others who are engaged in hospitals were tried to be locked by the landlords in fear of getting caught by COVID-19. Doctors and nurses were frightened to receive Corona patients and patients who had similar symptoms at the initial stage of COVID-19 spreading. In some cases, dead bodies of COVID-19 infected patients were abandoned by the family and neighbors due to the fear of further spreading of the virus. Coronavirus infected people had to face abandonment, rage and lack of sympathy due to heightened anxiety of people in the first few months since the spreading of the virus. Hopelessness has reached its height among the students who find themselves stranded as the education institutes are not taking face-to-face classes yet. Fear of sudden layoffs and

stress of extra online work have ignited depression among employees. Labor forces which are victims of sudden layoffs from factories are intriguing to find new work to avoid financial helplessness. Cases of lethal murders of young families were watched, where the earning person of the family killed his wife and children and then committed suicide due to financial depression in this pandemic.

2.1.2. Depression Due To Unemployment

Unemployment among university graduates is one of the major social problems in Bangladesh, and the unemployment rates have continued to increase, most likely due to insufficient job creation despite a consistently high economic growth over the last several years [3]. Due to COVID-19, this huge number of fresh graduates' chance of employment is at risk. Unemployment increases the risk of psycho-logical distress and attempted suicide, after initial mental health status and confounding factors are accounted for [4]. There were some cases of suicide recorded which had the reason of unemployment and financial stress during the starting of lockdown in Bangladesh. Unemployed people with high anxiety and depression scores have developed maladaptive coping strategies such as substance use, self-blaming, or denial [5]. Persons who were unemployed before the spreading of COVID-19 are likely to have such expressions after the pandemic started and layoffs began. Unemployment and poverty are playing major role in causing different levels of frustration, disappointment, depression, stress, social isolation, crime and suicide [6].

2.1.3. Domestic Violence

With COVID-19 shutting down economic activity in most parts of the world and people staying closer to home, street crimes like assault and robbery are down significantly, though domestic violence has increased. Executive Director of United Nations Women Phumzile Mlambo-Ngcuka stated that, "As more countries report infection and lockdown, more domestic violence helplines and shelters across the world are reporting rising calls for help". Confinement is fostering the tension and strain created by security, health, and money worries. And it is increasing isolation for women with violent partners, separating them from the people and resources that can best help them. It's a perfect storm for controlling, violent behavior behind closed doors. And in parallel, as health systems are stretching to breaking point, domestic violence shelters are also reaching capacity, a service deficit made worse when centers are repurposed for additional COVID-response.

If not dealt with, this shadow pandemic will also add to the economic impact of COVID-19. The global cost of violence against women had previously been estimated at approximately USD 1.5 trillion. That figure can only be rising as violence increases now, and continues in the aftermath of the pandemic.

2.1.4. Positivity in Difficult Times

Coronavirus situation has its positive effects towards people's mindset. Many have been showing gratitude for

what they have more than before. Educated people have started to pay attention to their dietary routine from fancy to healthy. In the lockdown situation, people have become more caring towards their family and trying to spend more indoor quality time together than before. There are more positive expressions for the services of frontline workers and volunteers and empathy for neglected classes of the society. A revolution of staying fit and healthy has been noticed among people.

Many also express greater appreciation of the need for giving restorative space for nature, for living a more balanced lifestyle, and for awareness about the importance of good health and hygiene. Some have expressed a new or renewed interest in cooking and many have noted positive dietary changes towards healthier eating.

The COVID-19 pandemic could rightly be termed as a loneliness pandemic [7]. However focusing on the positive sides of the pandemic not only helped alleviate the loneliness but also gave people the strength to survive this difficult phase.

2.2. Social Behavior

2.2.1. Social Solidarity Dichotomy

Collective behaviors have ranged from demonstrations of compassion and solidarity to demonstrations of aggression towards frontline health workers and other public personnel although the lockdown measures across the country mostly prohibit the gathering of people. Groups taking measures into their own hands, or social vigilantism, have increased and have at times involved violence were reported. On a bright side, there have been social solidarity positives as well – large sections of the population in most South Asian countries have complied with government directives on social distancing and many efforts by civil society groups have been made to support the more vulnerable. Social networks have been essentially valuable resources for emotional, psychological and in many cases financial support even if accessed only virtually.

Amidst the lockdown, the biggest challenge for India, with a population of over 1.3 Billion, is to maintain social distancing when the lockdown is relaxed for a few hours every day for buying groceries and everyday essentials [8].

2.2.2. Social Media: Use and Abuse

Social media use has increased tremendously during this pandemic and this is a global phenomenon. The use of social media platforms can positively influence awareness of public health behavioral changes and public protection against COVID-19 [9]. For example, the social platform Weibo organized one related topic area every day to collect useful information and discuss trends during the pandemic in China. Local governments and related departments would also update pandemic information through Weibo. The topics brought over 754.4 billion reading and more than 200 million people online to join the discussion every day. In Bangladesh, Facebook has been proved very useful as a social media for spreading awareness and conveying important information

and news as most of the population uses it. Electronic media such as Television and radio channels also played an enormously important role for collecting the news and teaching the dos and don'ts for the pandemic. Android applications such as Google MEET, Zoom, Skype and Facebook are being used for taking classes of students, attending meetings and other live communication purposes for mass conversations. In a study on interviewing the participants formally, Sarker et. al. found that updated information was received by 62.3% respondents from social media, 29% respondents from television, 7.2% from newspaper and 1.4% from various government websites in Dhaka [10].

2.2.3. Negligence to Awareness

As most of the population of Bangladesh live in poverty, poor and lower-middle class people started to neglect the necessary precautions taken for COVID-19 pandemic as soon as their ability of bearing the daily cost of livelihood were threatened due to the pandemic. People who earn daily to meet their daily necessities tried to find work in the lockdown even if they had to break the restrictions of maintaining social distancing. In the middle of summer when the temperature was very high and the weather was very humid, people were not wearing masks and PPEs because they couldn't stand the heat while they were working. Many people couldn't afford buying masks, gloves, sanitizers or soaps and thus they started to neglect the safety precautions of coronavirus. Government supplied these protecting reliefs as long as they could, but when it came to the fact of buying the protecting supplies, people started to neglect the whole pandemic. So, with time passed by, the negligence of people about this pandemic became a normal phenomenon though they were well-aware of the pandemic. After vaccination for COVID-19 was started, the negligence of awareness increased as people are thinking vaccination is the ultimate protection from the virus while they are told that it is not going to protect them from getting infected. As a result, people who have already taken one or both doses of coronavirus vaccine, are getting infected again. In 2021 when the lockdown was alleviated by the Government, people are doing all social and outdoor activities but with less precaution for coronavirus.

3. Environmental Dimensions

From immemorial times till now, people have been concerned about protecting the environment and minimizing the ways of environmental pollution. Air, water and land are non-renewable resources that are the subjects of pollution. As we all know that the environment can be polluted either in a natural way or by man-made reasons. Man-made pollution to the environment has become the main reason as men started to prosper their civilization day by day. In this case, environmental pollution due to pandemics cannot be unseen as it is challenging to handle and making resilience from it is difficult in times. About the relation of COVID-19 pandemic

with environmental pollution, it is evident that the medical equipment used in mass population for protection from the virus are thrown on the environment after using for one time which is polluting the land surface and the water bodies directly. From a positive perspective, this pandemic lowered the level of pollution in the air in almost all big cities around the world as the transportation rate became very low and governments applied lockdowns for a certain period of time in the beginning of Coronavirus pandemic to ensure social distancing. There are many more to discover about the relation of Coronavirus pandemic and environment pollution which is important for post pandemic environment resilience and conservation of natural resources in the long run.

3.1. Air Pollution

Air pollution is an important issue to take into account first because this pollution affects mankind living in it immediately and directly. In Bangladesh, air pollution in the urban and suburban areas is an acute headache for environmentalists. Urban areas like big cities, towns and commercial places in the country face air pollution mainly due to vehicle emissions, constructions of roads and buildings, crowds of people etc. In the sub-urban, the scene is slightly different as vehicles are less used in these areas than the urban areas, but unplanned constructions of buildings and gas emissions of dying factories, brickyards, tannery factories, factories that use woods as fuel mainly pollute air. While the Coronavirus pandemic started in the last week of March 2020, conscious people who could afford it, stayed at

home for their safety from the virus. After some time when the educational institutions were declared closed by the Government, mobility of people who were mainly associated with the education system was lowered at its least in a week, which also decreased pollution in the air. In the lockdown period and when the government declared general holidays, most of the population of Bangladesh tried and followed the instructions to protect themselves from Coronavirus. At that time, factories were also closed and all construction works were stopped, making the largest difference in air pollution around the country. NASA satellites have documented significant reductions in air pollution—20-30% in many cases—in major cities around the world. World's second least livable city in terms of pollution is Dhaka, which recently had an improvement in its air quality during the government-declared nation-wide shutdown from the last week of March to May to contain the COVID-19 pandemic. According to an international journal article titled "Impacts of nationwide lockdown due to COVID-19 outbreak on air quality in Bangladesh: a spatiotemporal analysis", it is said that "the concentrations of NO₂, SO₂, CO, and O₃ from 1 February to 30 May of the year 2019 and 2020 were analyzed and the average SO₂ and NO₂ concentrations were decreased by 43 and 40%, respectively, while tropospheric O₃ were found to be increased with a maximum of > 7%. Among the major cities, Dhaka, Gazipur, Chattogram, and Narayanganj were found to be more influenced by the restricted emissions. In Dhaka, NO₂ and SO₂ concentrations were decreased approximately by 69 and 67%, respectively."

Table 1. Classes of AQI values and their health implications (US EPA 2019).

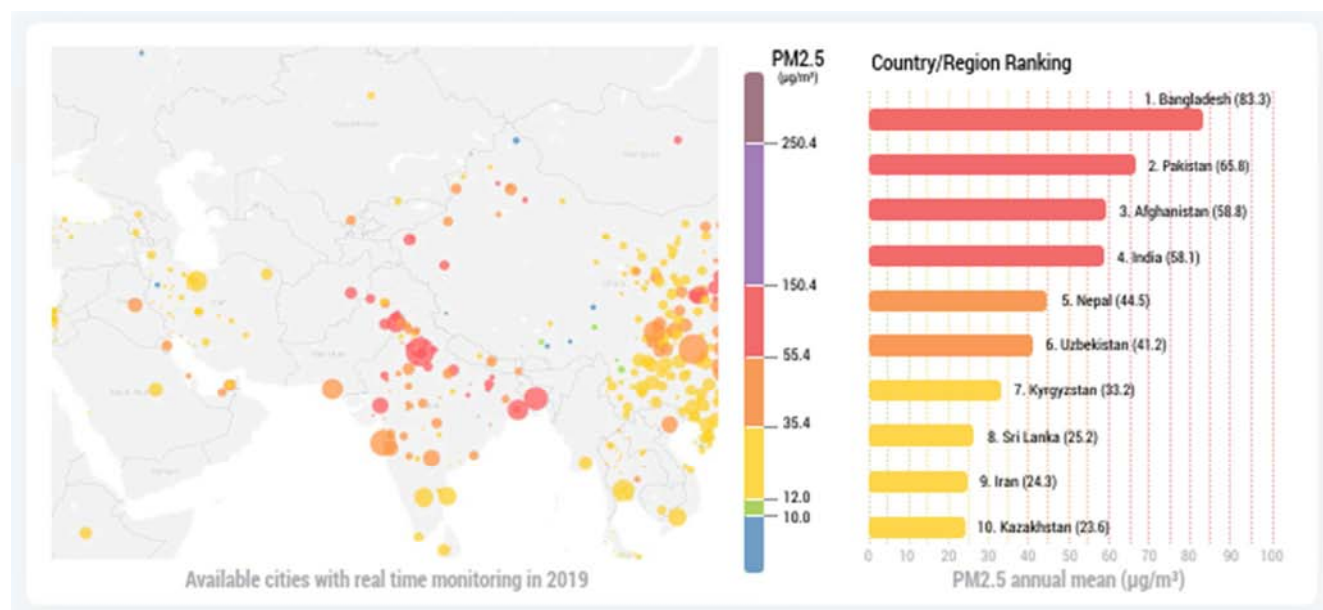
US AQI Level		PM _{2.5} (µg/m ³)	Health Recommendation (for 24hr exposure)
Good	0-50	0-12.0	Air quality is satisfactory and poses little or no risk.
Moderate	51-100	12.1-35.4	Sensitive individuals should avoid outdoor activity as they may experience respiratory symptoms.
Unhealthy for Sensitive Groups	101-150	35.5-55.4	General public and sensitive individuals in particular are at risk to experience irritation and respiratory problems.
Unhealthy	151-200	55.5-150.4	Increased likelihood of adverse effects and aggravation to the heart and lungs among general public.
Very Unhealthy	201-300	150.5-250.4	General public will be noticeably affected. Sensitive groups should restrict outdoor activities.
Hazardous	301-500	250.5+	General public is at high risk to experience strong irritations and adverse health effects. Everyone should avoid outdoor activities.

The US AQI is among the most widely recognized index for communicating air quality. The index converts pollutant concentrations into a color-coded scale of 0-500, where higher values indicate increased health risk. The US AQI "Good" range (<12µg/m³) is marginally higher than the WHO Air Quality Guideline (<10µg/m³).

In Bangladesh, comprehensive air pollutant emission inventory is still unavailable. Vehicular and industrial emissions are considered the major sources of air pollution in Bangladesh [11]. Alam (2009) reported five industries, including food, cement/clay, pulp and paper, textile, and tobacco, contributed to about 84% of the country's total industrial air pollution in 2001 [12]. Apart from these, brick kilns also cause massive air pollution in the country, particularly in the dry season [13].

Bangladesh is consistently ranked as one of the most polluted countries in the world for decades. According to the world air quality report (2019) by IQAir, Bangladesh was the most polluted country in 2019 [14]. Among the global megacities, Dhaka is consistently ranked as one of the top polluted capital cities. A recent study on air quality in the world's most polluted 50 cities found that Dhaka is the second most polluted city in the world with an average annual PM_{2.5} level of 97.1µg/m³ [15]. Generally, the level of air pollutants varies with time and seasons. In Dhaka, the average concentrations of major air pollutants except for O₃ show strong seasonal variation, with the maximum during winter and minimum during monsoon [15]. During the dry season (November–April), the urban areas in Bangladesh suffer from severe air quality problems. During these months,

PM concentrations frequently rise to 7–8 times than the WHO standard [16].



Source: IQAIR 2019 World Air Quality Report

Figure 3. IQAIR 2019 Air Quality Ranking of South-Asian Countries (including Bangladesh).

The region includes 30 of the top 40 most polluted cities and four of the five most polluted countries. Only one city in this region (Sanandaj, Iran), out of 147 cities with monitoring data in 2019, met WHO targets for PM2.5 levels.

In the light of several studies, the air quality management wing director of the Department of Environment (DoE), Md Ziaul Haque said that Dhaka's air quality improved by more than 30 percent during the general holidays [17]. The air pollution started to get increased as soon as the general holidays were finished but still is not as much as before because of postponing construction works and decreased public transports as many people are doing their office from home and closed educational institutions.

Using a weighted population average, Bangladesh emerges as the most polluted country for PM2.5 exposure, based on available data. Pakistan, Mongolia, Afghanistan and India follow behind respectively, deviating from one another by less than 10%. Bosnia and Herzegovina is the highest ranking country in Europe for PM2.5 pollution, featuring as the 14th most polluted country globally, with only 4µg/m³ less than China's national PM2.5 weighted average [13].

3.2. Water and Disasters

To maintain the cleanliness and precaution from getting affected by COVID-19, there was an immediate hike in water usage all over the country. People were trying to follow the proper ways of washing hands, cleaning clothes, utensils and daily used materials which they carry outside their home and that caused increased indoor usage of water. When there was news on the national television that COVID-19 was found on sewerage water, Chittagong Water Supply and Sewerage Authority doubled the level of chlorine used to purify the water which could possess greater health risks [18]. On the

other hand, Lockdowns have stalled water infrastructure development and may affect delivery of services such as drinking water, irrigation and energy.

In July, floods reigned almost all over the country challenging the safety issues of economically vulnerable people during COVID pandemic in the affected areas. During monsoon, the wastes which also include singly used masks, hand gloves, PPEs and other medical wastes pollute the surface water and soil; however, plastic wastes are not new to be dumped on water and soil in Bangladesh. The garbage thrown on the ground carrying non-perishable face masks, plastic personal protection equipment, plastic hand gloves are usually flown away with rain water and block the sewerage lines that cause water to be stagnant in the urban and suburban areas. But, also, the quality of surface water improved in other ways as the industries which are accused of polluting surface water were shut down during the lockdown period.

For COVID-19, handwashing is the most important practice which we should focus on and ensure handwashing material is available and affordable in the market. 74.8% Handwashing facility with water and soap. Ensure continual functionality of water facilities in rural and urban areas. 47.9% Use of safely managed drinking water services. 42% indicated hygiene materials are not easily accessible. (COVID-19: Bangladesh Multi-Sectoral Anticipatory Impact and Needs Analysis).

Lockdown has brought about amazing changes in nature in different countries. Bangladesh is no exception. Cox's Bazar, Saint Martin's has seen a dramatic alteration in nature due to decrease in fishing and tourism. Pink dolphins have already been spotted in the waters closer to the beaches. A group of dolphins were playing in the blue water of the sea. Local

people said such a rare sight had not been seen in the last three decades. The Bay of Bengal is becoming a sanctuary for 407 species of fish, including 36 species of shrimp. Seaweed, grass and wildflowers are spreading through the sand of the beach.

Red crabs that play a significant role in the ecosystem appear ashore in Kuakata and Gangamati points. They are reclaiming the beach from where they were evicted, after a long time. According to experts, this time the breeding of turtles will be better. Large numbers of turtles are occupying St. Martin's island. They are coming, wandering around, resting and laying eggs again. There is no one to stop them. Moreover, there is a good chance of seeing a variety of marine animals like sea-hogs, Irrawaddy dolphins and more.

Tanguar Haor, the wetland rich in biodiversity, plays an important role in the fish production of Bangladesh and acts as a mother fishery of the country from which the government receives good annual revenue.

3.3. Pollution on Land Surface

By far, most soil pollution is due to human activities. As an agrarian country with numerous numbers of rivers, Bangladesh truly depends on its fertile land for crop production and food security. Due to COVID-19 pandemic, the amount of non-perishable medical wastes which are mostly made of plastic, are polluting the land surface. It is true that many countries are facing challenging situations while handling huge amounts of extra medical wastage caused by this pandemic, Bangladesh has an even worse scenario in this case.



Figure 4. COVID wastes disposals by mass people.

The municipal wastes are regularly taken care of, but in the sub-urban and rural areas the wastes are just thrown away on the open soil which covers the land surface over time. Besides, there was no disclaimer from the Government about how the used PPEs should be thrown away. This caused ignorance among people and they started to throw their used PPEs, mostly surgical masks and hand gloves, on roads or on open spaces. This could pose a great threat in future when the agricultural lands and rivers, drains and sewerage lines will

be covered and blocked by these wastes as these are made of plastic.

4. Conclusion

With time, the efforts of protecting our environment and society are getting more challenging. Even though coronavirus has grabbed the entire emergency attention in 2020, our environment and society need continuous aiding to survive in this pandemic. Society and its institutions came at the breaking point while this pandemic grabbed its peak. This happened as the result of social insecurities and lacking of social bonding. Coronavirus made many families break into pieces; many families had to migrate to villages to survive the financial crisis. The psychological pressure caused by this pandemic was huge to see. Cracks in social solidarity, changes in social and religious practices were watched by the nation. On the other hand, Bangladesh also experienced its power of positivity among her people and the spirit to fight back this pandemic. The COVID-19 pandemic is truly a reality-check for this nation's strategy of survivability which Bangladesh is handling in its own way with its very limited resources. In the case of environmental pollution, the effects are rather long-run effects than it seems to be. The continuous efforts of saving our environment from all types of pollution were seriously hampered due to mounting medical wastages, but nature worked its own way to clean the surroundings when humans were jailed in their cages. That also happened in Bangladesh and after many years, the city dwellers experienced fresh air during the lockdown period. It is proven that the relationship between humans and nature has to be symbiotic in order to ensure the survival of our race. Therefore our efforts towards the resilience of a good environment need to be reassured through immediate actions and long-run strategies. Like the governments of other countries around the globe, the government of Bangladesh is also trying to pay attention to all these aspects of social and environmental securities for its people as much as it can. The fight against Coronavirus is still ongoing in this country and hopefully it will succeed till the vaccines and medicines for this virus are available among the people of Bangladesh.

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References

- [1] McMahon G., Creaven A. M., Gallagher S. (2020). Stressful life events and adolescent well-being: the role of parent and peer relationships. *Stress Health* [PubMed] [Google Scholar].
- [2] Brooks S. K., Webster R. K., Smith L. E., Woodland L., Wessely S., Greenberg N., Rubin G. J. (2020). The psychological impact of quarantine and how to reduce it: rapid review of the evidence. *The Lancet*. 2020; 395 (10227): 912–920.

- [3] Rafi M. A., Mamun M. A., Hasan K., Hossain M., Gozal D. (2019). Psychological Implications of Unemployment Among Bangladesh Civil Service Job Seekers: A Pilot Study. *Front Psychiatry*. 2019; 10: 578. Published online 2019 Aug 12. doi: 10.3389/fpsy.2019.00578.
- [4] Reneflot, Anne & Evensen, Miriam. (2014). Unemployment and psychological distress among young adults in the Nordic countries: A review of the literature. *International Journal of Social Welfare*. 23. 10.1111/ijsw.12000.
- [5] Navarro-Abal Y., Climent-Rodríguez J. A., López López M. J. (2018). Psychological Coping with Job Loss. Empirical Study to Contribute to the Development of Unemployed People. *International Journal of Environmental Research and Public Health*. 15. 1787. 10.3390/ijerph15081787.
- [6] Kidwai A. & Sarwar Z. (2015). Psychological Impacts of Unemployment – Evidence from the Literature.
- [7] Santos, L. (Host) (2020). Bonus: Beat your isolation loneliness [audiopodcast episode]. In *The Happiness Lab* with Dr. Laurie Santos. New York, NY: Pushkin Industries. Retrieved from <https://www.researchgate.net/deref/https%3A%2F%2Fpodcast.s.apple.com%2Fus%2Fpodcast%2Fcoronavirus-bonus-beat-your-isolation-loneliness%2Fid1474245040%3Fi%3D1000468548405>.
- [8] Vibha, Prabhu A. N., Kamath G. B., Pai D. V. (2020). Keeping the country positive during the COVID 19 pandemic: Evidence from India. *Asian J Psychiatr*. 2020; 51: 102118.
- [9] Al-Dmour H., Masa'deh R., Salman A., Abuhashesh M., Aldmour R. (2020). Influence of Social Media Platforms on Public Health Protection Against the COVID-19 Pandemic via the Mediating Effects of Public Health Awareness and Behavioral Changes: Integrated Model. *Journal of Medical Internet Research*. 22. e19996. NASA. Airborne nitrogen dioxide plummets over China. 2 March 2020. www.earthobservatory.nasa.gov/images/146362/airborne-nitrogen-dioxide-plummets-overchina.
- [10] Md. Mizanur Rahman Sarker, Anika Nawar Fagun. COVID-19, Food Security, Food Prices and Urban-rural Interrelationship for Sustainable Food and Nutritional Security: A Study on Dhaka City. *International Journal of Agricultural Economics*. Vol. 6, No. 1, 2021, pp 47-58. doi: 10.11648/j.ijae.20210601.16.
- [11] Mahmood S., (2012). Impact of Climate Change in Bangladesh: The Role of Public Administration and Government's Integrity. *Journal of Ecology and the Natural Environment*. 4. 10.5897/JENE11.088.
- [12] Alam GMJ (2009) Environmental pollution of Bangladesh – its effect and control. In: International conference (ICME 2009), 26–28 December, Dhaka.
- [13] Guttikunda S. K., Khaliquzzaman M., (2014). Health benefits of adapting cleaner brick manufacturing technologies in Dhaka, Bangladesh. *Air Qual Atmos Health* 7: 103–112.
- [14] World air quality report (2019) by IQAir.
- [15] Rodríguez-Urrego D., Rodríguez-Urrego L. (2020). *Environ Pollut*. 2020 Nov; 266: 115042. Published online 2020 Jul 3. doi: 10.1016/j.envpol.2020.115042.
- [16] Rahman M. M., Mahamud S., Thurston G. (2018). Recent spatial gradients and time trends in Dhaka, Bangladesh air pollution and their human health implications. *Journal of the Air & Waste Management Association*. 69. 10.1080/10962247.2018.1548388.
- [17] Rana M. M., Khan M. H. (2020). Trend characteristics of atmospheric particulate matters in major urban areas of Bangladesh. *Asian Journal of Atmospheric Environment*. 14: 47–61.
- [18] <https://tbsnews.net/environment/air-quality-dhaka-lessons-COVID-19-shutdown-97801>.
- [19] <https://www.kalerkantho.com/online/country-news/2020/06/28/928500>.