

Comprehensive Impacts Caused Due to COVID-19: Karnataka Case Study

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Abstract- The world has seen the outrage of the novel coronavirus which has spread from Wuhan, China to a global scale and has undergone many changes due to its mutating capabilities which resulted in the hinderance of developing a vaccine. One of the greatly affected parts of our lifestyle is the environment as it is considered to be an integral part of life. Corona virus disease 2019 is an infectious disease which is caused by severe acute respiratory syndrome corona virus-2 (SARS CoV- 2). Even though there is advancement in science and technology throughout the world, this virus has shaken all verticals of life. One among the greatly affected countries in the world is India. With a 1.37 Billion population, the rise in active cases is increasing exponentially. In this paper, major environmental impacts caused due to COVID- 19, reduction in greenhouse gas levels and the impact of lock down is discussed. For discussing the above stated problems, Karnataka state from India is considered as a case study as Karnataka is one of the highly populated states in the country with a considerable number of active COVID- 19 cases. The measures and sustainability of the present environmental conditions are stated explicitly in this research paper as this virus has led to major climatic alterations in all the continents.

Keywords –Air pollution; Coronavirus; Carbon dioxide emission; Environmental impacts; Health risks

I. INTRODUCTION

The Coronavirus disease nineteen pandemic is an ongoing global pandemic caused by severe acute metabolic process syndrome coronavirus a pair of (SARS CoV 2). The happening of this novel virus was first known in city, China, in Gregorian calendar month 2019. The World Health Organization (WHO) has confirmed the happening a Public Health Emergency of International Concern on January 30, 2020 and a scourge on March 11, 2020. As of July 16, 2020, just about, over 13.5 million cases of COVID-19 are rumoured in additional than 188 countries and territories, leading to over 584,000 deaths; over 7.59 million people have recovered.

The virus is primarily unfold between people throughout shut contact, most frequently via little droplets created by coughing, sneezing, and talking. The droplets typically fall to the bottom or onto surfaces instead of moving through air over long distances. Transmission might also occur through smaller droplets that are suspended within the air for extended periods of time. Less unremarkable, people could become infected by touching a contaminated surface and further touching their face. It is most contagious throughout the initial 3 days once the onset of symptoms, though unfold is feasible before symptoms seem, and from people that don't show symptoms. Common symptoms embody fever, cough, fatigue, shortness of breath, and loss of sense of smell. Complications could embody respiratory illness and acute metabolic process distress syndrome. The time from exposure to onset of symptoms is often around 5 days however could vary from 2 to 14 days.

There is no celebrated vaccine or specific antiviral treatment. Primary treatment is symptomatic and confirmative medical aid. Recommended preventive measures embody handshake, covering one's mouth once coughing, maintaining distance from others, sporting a mask publicly settings, disinfecting surfaces, increasing ventilation and air filtration inside and observation and self-isolation for people that suspect they're infected. Authorities worldwide have responded by implementing travel restrictions, lockdowns, geographical point hazard controls, and facility closures. Several places have conjointly worked to extend testing the capability and trace contacts of infected

persons. The pandemic has caused world social and economic disruption, as well as the world's worst recession since the Great Depression-1930 and world famines poignant 265 million people. It has led to the postponement or cancellation of sporting, religious, political, and cultural events. Widespread provide shortages exacerbated by panic shopping and reduced emissions of pollutants and greenhouse gases. Schools, universities, and faculties are closed either on a nationwide or native basis in 172 countries, poignant just about 98.5 percent of the world's student population. Information regarding the virus has circulated through social media and mass media. There are incidents of social phobia and discrimination against Chinese folks and against those perceived as being Chinese or as being from areas with high infection rates.

Due to the present pandemic, there is a decrease in the release of carbon dioxide by 5% but, scientists state that this is not a desirable change. A minimum of 7.5% decrease in the release of greenhouse gases per year is required until 2030 in order to maintain our global temperature. If these requirements are not met, the average global temperature would exceed the threshold of 1.5°C on comparison with the pre- industrial era. The present carbon dioxide level recorded 410 ppm was previously experienced during the Cenozoic era. But the sea- level during that era was 3- 4 meters higher than present sea- level. This era was prominent for the catastrophic events and an imbalance in the bio- geo chemical cycles. Though the carbon dioxide, nitrogen and sulphur components have reduced greatly, the gases released due to mass cremation in China and Italy in order to burn the deceased patients who have succumbed to this virus has impacted the air quality in those countries. But, with the reduction in the number of active cases, the air quality is getting better. The large emission of sulphur dioxide in China indicated that approximately 300,000 bodies were burned. As it is not advisable to bury the infected patients who have succumbed to death, burning and mass cremation has resulted in release of highly toxic gases into the atmosphere and it is to be estimated that the amount of carbon emission has been reduced by 17% in the world which is noted as a remarkable change. The air quality index of most of the popular cities such as New York, Delhi, Paris etc have come down to permissible levels.

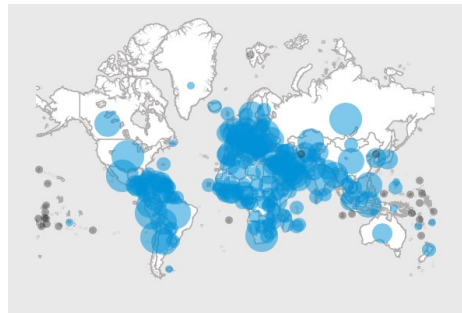


Figure 1: World COVID- 19 data with active cases

II.METHODOLOGY

2.1 Positive and negative impacts of COVID- 19-

- Decrease of greenhouse gases and particulate matter

The air quality has improved in most of the countries and this is regarded to have significant influence on the global mortality and that 8% of the deaths caused every year are due to poor air characteristic which is observed in most parts of Africa, Asia and Europe. Sharp decrease in the NO₂ and particulate matter composition was observed in Paris, Madrid, Rome and China due to strict implementation of quarantine.

S. No	Sectors	Greenhouse gas emission
1	Electricity and heat production	25%
2	Transportation	14%
3	Industry	21%
4	Buildings	6%
5	Agriculture	24%
6	Other energy	10%

Table 1: greenhouse gas emission from various sectors

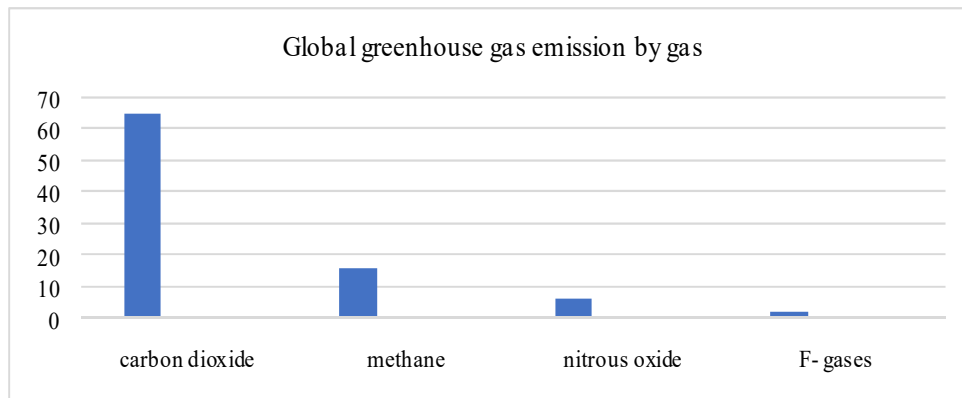


Figure2: Global greenhouse gas emission by gas

- Cleaner coastal areas

Coastal areas are regarded to be one of the most important natural capital assets. They provide transportation, exports and imports, tourism and recreation. These services provide economy to the coastal communities and hold essential values which should be protected from overexploitation.

Due to lockdown and social distancing, the tourism has fallen steeply across the globe and this has resulted in a notable change in the appearance of the coastal areas.

- Reduced noise pollution levels

Anthropogenic activities such as industrial or commercial activities, transit of vehicles cause environmental unwanted noise which is one of the reasons for major health problems. This issue has also been resolved indirectly due to this virus.

The noise pollution caused due to aircraft has also reduced which is benefitting the birds.

- Work from home

This major change in workforce has resulted in many retailers to reduce their retail outlets furthermore reducing rent, workplace, electricity combustion, carbon dioxide emission though logistics. Individual employees are getting more family time simultaneously growing in their respective fields.

- Increased amount of waste

The increased demand for panic shopping during this pandemic has led to increased amounts of organic and inorganic waste which in turn result in major environmental problems such as soil erosion, air pollution, water pollution and deforestation.

In most of the countries, the amount of plastic has also increased due to the frequent usage of personal protection kits, masks and gloves.

Medical waste is also one of the major concerns during this pandemic and this problem is foretold in almost all the countries where this pandemic is considered to be a major issue.

- Waste reprocess decline

As there is a risk of spread of COVID- 19, most of the countries have stopped recycling water. This process of recycling water is done in order to save energy, prevent pollution and preserve natural resources. Therefore, most of the European countries have shut the waste reprocessing and imbibed usage of single use plastics which is even more harmful to the milieu.

- Increase in tree logging

Due to the restrictions imposed, the number of frequent check-up have reduced drastically around the regions of Amazon rainforest. Due to these restrictions, there is a 30% increase in tree logging around the Amazon region and which in turn causes forest wildfires. These wildfires would result in endangering all the plant and animal species which would further disrupt the food chain.

- No social life

This pandemic has imposed heavy restrictions on reducing our social life and this has led to serious mental problems such as depression, anxiety etc. As the virus is rapidly spreading due to touching contaminated surfaces where the virus could sustain for more than 8 hours, this is considered to be the most important cause of social restriction. India, being the world's biggest democratic country has undergone complete lockdown by allowing no social life to its citizens.

- Lacking motivation

Nature is a natural motivator and without the interaction of human beings with nature, people are prone to have reduced energy levels. Sun is considered to be a natural energy system which boosts internal energy and immune system and by staying indoors for a long period of time, we are unable to receive the source of energy. Due to this unprecedented situation, our human body has undergone many chemical changes which has resulted in people becoming lassitude.

2.2. COVID- 19 data for Karnataka State-

With more than 47,000 cases prevailing, Bengaluru is the highly affected district in Karnataka with more than 23,000 cases. Most of the cases were due to secondary contact and the percentage of men who got effected with coronavirus was 63% and women were 36%. This virus was prominent among the ones who aged between 30- 39. Approximately 500- 700 patients are hospitalised every day and 1000 recovered patients are discharged from hospitals. Karnataka is also considered to be one among the highly recovering states in India with arecovery rate of 40%. The death toll is recorded to be 752 with maximum deaths observed in Bengaluru Urban (310).

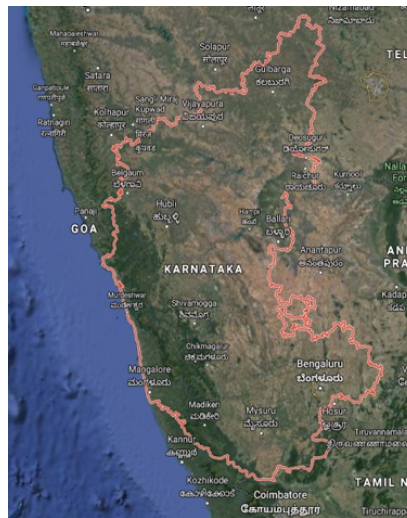


Figure3: satellite view of Karnataka, India
Source: Google.inc

The important trends for Karnataka COVID data dated until 21/05/2020 are presented here-

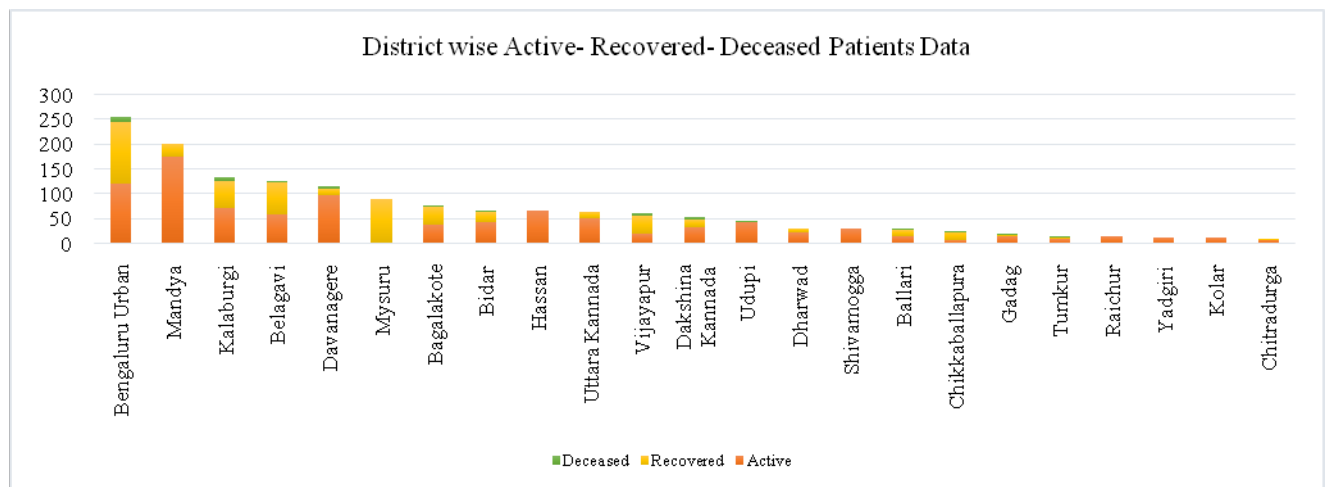


Figure4(a): District Wise Active- Recovered- Deceased Patients Data

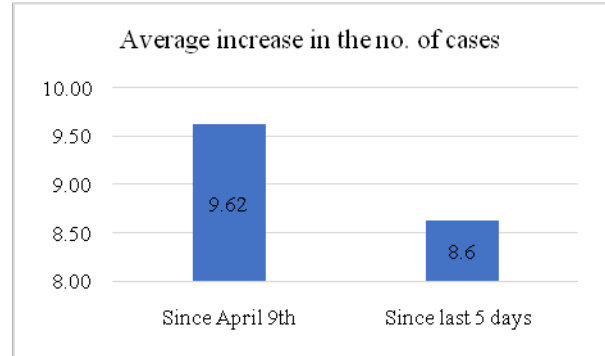
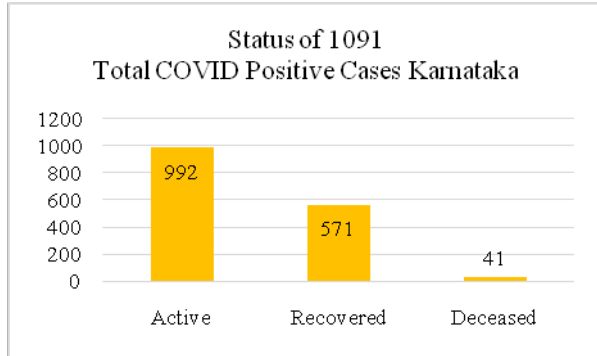


Figure4(b): Status of COVID Positive Cases as of 21/05/2020

Figure 4(c): Average Increase in the No. of Cases from 09/04/2020

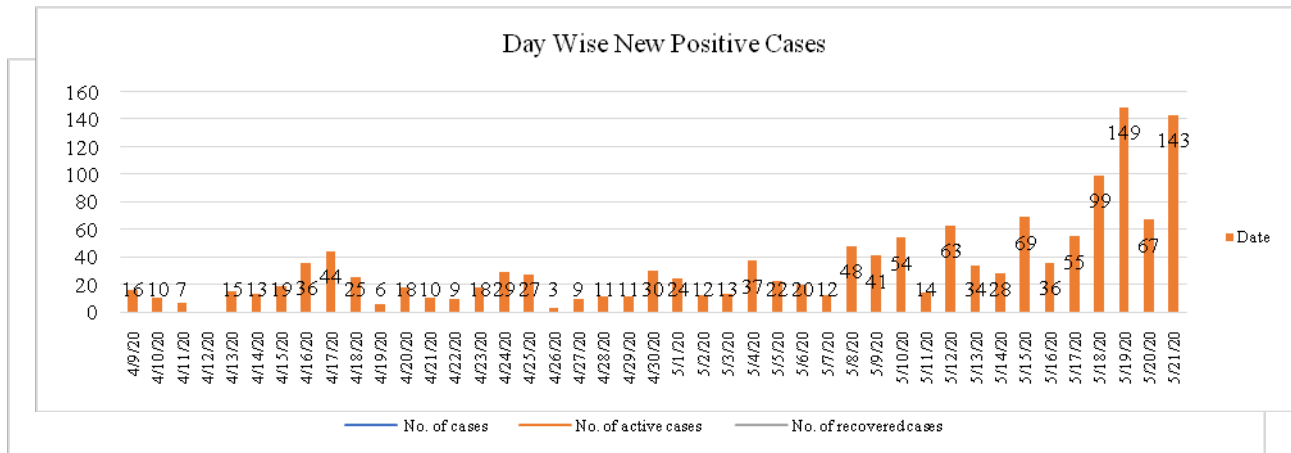
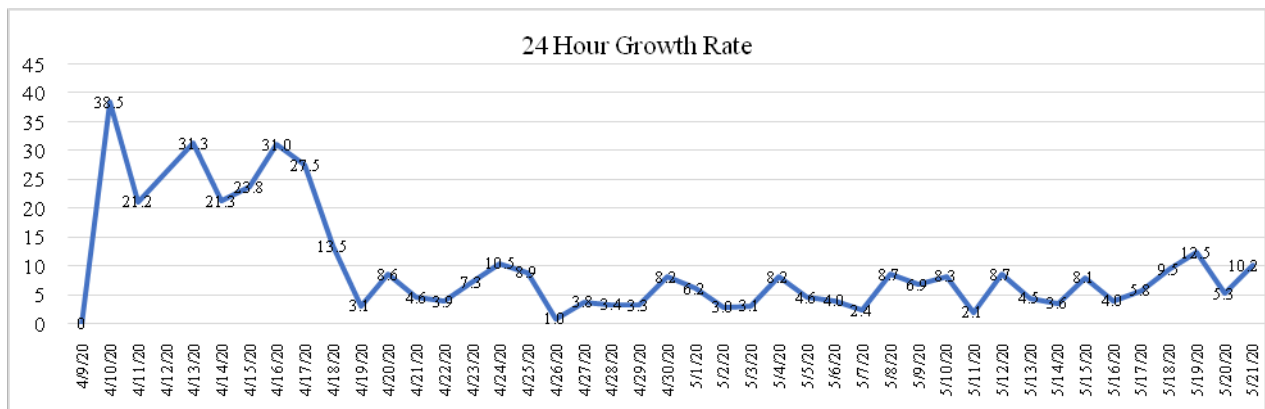


Figure4(e): Day Wise New Positive Cases Until 21/05/2020

Figure4(d): Date Wise Total Cases & Active Cases Until 21/05/2020



III. DISCUSSION

3.1 Environmental Impacts Caused in Karnataka, India-

Though this novel virus has greatly impacted the society, there are many considerable advantages. Due to the lock down, the amount of carbon dioxide emission and nitrogen oxide emission has reduced and the vulnerable climatic conditions which were prevailing for the past five decades are now being curbed. The percentage of greenhouse gases in the environment is diminishing which in turn is impacting the global warming, a major concern in this decade. The reduction in transportation and shut down of industries in the present situation has reduced 50% of CO₂ emission and nitrogen and sulphur oxides by 18-20%. The major concern of the prevailing environmental conditions is that if they would be consistent even if the situation gets better and that there is a risk of high shoot up in the

greenhouse gas levels once this COVID- 19 virus gets subsided. The re-suspension of dust is responsible for 20% of the pollutants prevailing in the air, with DG sets and smoke from households and hotels making up the rest of the pollution levels in Bangalore, capital city of Karnataka, India. The air quality was of big concern in Bangalore as it is regarded as the Silicon Valley of India. With IT- hubs placed as along the city, the air pollution has increased exponentially, and the Government of Karnataka had to implement schemes to reduce the Air Quality Index (AQI).

Now, under the present circumstances, the air travel is completely banned, and vehicular travel has been reduced to 10% i.e. ambulances and government vehicles are permitted to travel in the state and construction work has been stopped for the past four months and industries are not permitted to work as per regular schedule. All these restrictions have added to the reduction in the air pollution and the current AQI of Bangalore is between zero and fifty. This tilt in the air quality scale had begun from April 2020. The pollution levels in the city had been reduced by as estimate of 55- 70% and about 25- 30% of the pollution still remains due to the re-suspension of fine dust caused due to wind flow and local movement. The dip in the pollution levels had a perceptible effect in the state's birds and animal lives. Many birds are returning to their original habitat and rare breeds have been spotted in most of the forests in Karnataka. Due to the reduction in peroxyacyl nitrates which cause smog, the plants and flowers look cleaner and brighter. This lock down has not only affected the air but also impacted the water pollution. Most of the lakes look less turbid as there is no industrial effluent discharge. The rivers in the state look cleaner and there is no trace of toxic foam in water. Since there is no boating and fishing facilities available, the oil and grease content has reduced significantly. Taking all the environmental concerns into contemplation, it has also been stated that the state might curb IT staff's foreign travel. Karnataka's airports are regarded as one of the busiest airports in the country and this travel restriction would be of great contribution to the climate and its sustainability. It is therefore regarded that this quarantine has regained the permissible environmental conditions across the state.

IV.CONCLUSION

Coronavirus disease 2019 (COVID-19) is an infectious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has impacted the world. This COVID- 19 has not only impacted the world negatively but also resolved some of the world's major concerns such as global warming, greenhouse gas emission and pollution levels. The indirect positive and negative impacts such as decrease in greenhouse gas emission levels, cleaner beaches etc and increase in organic and inorganic waste and reduction of waste reprocessing. In this paper, the positive impact of COVID- 19 is mostly concentrated and the environmental sustainability of Karnataka which was considered as a case study is presented here. The reduced air quality index and water quality index values depict that the global concerns are getting better. This quarantine and strict lockdown rules have impacted the neighbouring rivers and water bodies and the air pollution. Therefore, it is the responsibility of the citizens of Karnataka to not re-pollute the state after the lockdown has been removed as this might create vulnerable situations for the coming future. These conditions, if retained, would impact the globe in resolving climate change, environmental vulnerability etc.

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