Summary Report

1. Summary of your solution.

This solution shows the combined analysis of geospatial data and statistical data. The environmental changes caused by COVID-19 and societal response to it have both positive and negative effects. In some scenarios, it has shown positive changes, and somewhere it was negative too. Now coming to the positive result, there was huge declination in air pollution during COVID-19 the study shows it effectively. Air pollution has become a severe problem in various metropolitan cities and industrialized centers across the country. Incomplete combustion of fossil fuels by automobiles and industrial operations, and improper disposal of anthropogenic waste are the root causes of the rapid increases in air pollution. In March 2020, the COVID-19 pandemic led to a nationwide lockdown to control the spread of infection.

The total stretch of various phases of lockdown was 68 days. This long stretch of restrictions on economic activities provided an opportunity for improving Air quality. On the other hand, when we talk about negative impacts, Deforestation, wildfire events, and urbanization has taken the negative curve during this pandemic. This study shows the visual impact of wildfire around the world. due to social distancing and pandemic, it was hard to control the wildfire. There were many places where the army couldn't reach to help people and the wildfire smoke did also increase the number of cases of COVID-19. In the subject of deforestation, this study has taken the points from many research papers that there has been an opportunity for illegal forest cutting around Indonesia due to this COVID-19 lockdown. At the last when it comes to urbanization, there has been somewhere middle effect of COVID-19, because of travel restriction the industrialization had been put on hold in some places.

2. Key outcomes or takeaways from your solutions.

- Change in Air quality and the response of society towards it.

Time - Period :

- **Phase - 1: April 14, 2020**
- **Phase - 2:May 5, 2020**
- **Phase - 3:May 17,2020**
- **Phase - 4:May 31,2020**
- **Phase - 5:Jun 06,2020**

Region of Interest: Ankleshwar, Gujarat, India

- Impacts of wildfire events around California, US.

Time - Period:

- **Pre Event: July 15, 2020**
- **Post Event: September 17, 2020**

Region of Interest: Mendocino National Forest, California, US

- Illegal deforestation caused by Indonesian farmers and contractors.

Time - Period :

- **Pre Event: June 16, 2019,**
- **Post Event: October 6, 2021**

Region of Interest :Tanjung Langkat Forest, Langkat regency, North Sumatra, Indonesia

- Declination in the map of urbanization due to COVID-19 lockdown.

Time - Period :

- **Pre Event: January 20, 2020**
- **Post Event: February 20, 2021**

Region of Interest: Hong Kong, China

3. How did your solution involve geospatial data?

This study uses the geospatial data for getting the proper insight into environmental changes caused by COVID-19 and society, it also includes the visual effect plus the location of that changes. It combines the study of both statistical data and satellite data for getting the impact of the COVID-19 pandemic. It adds the temporal collections of data to see the analysis of the situation. It has also added the real-time impact of COVID-19 to further analysis.

Let's take one of the examples from my documentation, for studying the wildfire events, it includes two raster tiles where one follows as pre-raster before the wildfire event and the other follows the post-wildfire event. Both tiles have the geospatial information around the changes. Here for getting further analysis, we apply image processing operation on both rasters to get the burnt index, which processes the final result, as the built-up index map. We get one raster map that does have the highlighted pixels in the image to show the burning places and how much intensity the fire did have on that location. It does also give the result of how much area has been impacted due to that situation by a further process.

4. Does your solution require improvements in terms of data or methodology?

Yes, it does need improvement in terms of data, adding more temporal datasets and some image processing and deep learning terminology will provide more good analysis around the changes.