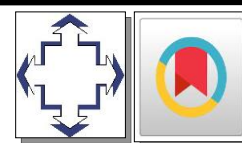


# The Impact on Economic and Environmental Development of COVID-19 Pandemic: a Case Study In Indonesia



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## ABSTRACT

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The goal of this analysis is to examine in greater detail the effect of the COVID-19 pandemic on economic development and the quality of the atmosphere in Indonesia. This report uses secondary data as the primary source, obtained using a secondary data collection method from many different organizations. Different government policies and measures to discourage the escalation of the transmission of the Coronavirus, one of which is large-scale social restrictions (PSBB). However, before Indonesia suffered a recession, the PSBB actually became a barrier to economic development. As a part of this program, the rise in environmental efficiency is another positive effect because traffic that generates emissions and vast manufacturing sectors that create dirty waste is temporarily halted. Based on the findings of the review, this report notes that there is a detrimental effect of COVID-19 on economic development in Indonesia. However, because of the introduction of PSBB, Indonesia's air quality has improved. This report is intended to serve as a reference and assessment of the effects of COVID-19 on the economy and the atmosphere for stakeholders and the general public. In order to allow the government to consider measures that will deter the spread of the coronavirus and restore the economy without damaging improved air quality.

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## 1. Introduction

Indonesia is a country that is also said to be a developing country, and Indonesia aims to pursue sustainable development so that it can become a developed country. Since the end of 2019, owing to the coronavirus pandemic or what is known as COVID-19 that affects the welfare of the global population, the world economy has started to shake (Wang & Su, 2020). Apart from health, this pandemic also threatens a decline in social and economic activity in the world. Even though this virus looks like a trifle, this virus has an impact on death. Therefore this pandemic is ravaging the world.

The World Health Organization (WHO) declared in early 2020 that the coronavirus had been a worldwide pandemic and that Indonesia was no exception. At the beginning of March 2020, the COVID-19 pandemic started to hit Indonesia. Since then, the Indonesian government has made numerous measures and appeals in order to anticipate the transmission of the coronavirus. Large-scale Social Constraints (PSBB) were one of the policies introduced that had an impact on the economic turnaround, especially in Indonesia. In addition to affecting world public health (Bai et al., 2020), the COVID-19 pandemic still severely affects global economic development, which will slow down (Lai et al., 2020).

The International Monetary Fund (IMF) has reported lest there will be a contraction in the global economy in 2020. The rate of global economic growth will decrease by -3 percent (Gopinath, 2020). The COVID-19 pandemic is considered to have a negative impact on the national and international economy. It has resulted in instability and impediments to global growth because of the rapid dissemination of the coronavirus pandemic around the world. Moreover, in order to monitor the dissemination of the coronavirus in all countries, in particular Indonesia, it has placed dramatically reducing restrictions on the flow of social events, transport, and economic activities.

The pandemic of COVID-19 is contributing to an economic slowdown because many analysts expect that it would have a larger impact than the financial crisis of 2008. The global crisis that has arisen from this pandemic has contributed to hypotheses that air emissions and the greenhouse effect could be minimized. Based on recent studies, emissions or environmental deterioration is reported to rise as a result of economic development and the degree of environmental degradation will decrease as the economy declines (Wang et al., 2019; Wang & Su, 2020). However, there are also reports that say that economic development has little to do with environmental destruction. Such as research by Cori & Bianchi (2020) that explores the economic growth in Singapore, which notes that economic growth and CO<sub>2</sub> emissions are not related, which means that without causing environmental harm, Singapore will sustain economic growth.

The goal of this analysis is to systematically analyze and pursue proof of the hypothesis and fact regarding the complex effect of the COVID-19 pandemic on the economy and the climate. Using the Situation of Indonesia as a case study, this study will examine these issues and conduct in-depth testing of the evidence that has happened as a result of the COVID-19 pandemic attack. In addition, this report will also be a guide for researchers who wish to conduct advanced studies, and this study is intended to be an appraisal material for the government and to decide the effect of COVID-19 on the economy and the environment. This study is intended to enrich and become scientific literature focused on the viewpoint of environmental, economic emergencies on the relationship between the economy and the environment.

There is still very little literature on this topic and some science related to this study is still very recent, given that this viral pandemic has never existed before. Some related literature, however, is available on the relationship between economic development, exposure to pollutants, and the spread of viral infections. Studies by Chen et al., (2010); Cheng et al., (2020); Peng et al., (2020); Ye et al., (2016) are among them. Some recent research, including studies by Conticini et al., (2020); Nicola et

al., (2020); Piazzalunga-Expert, (2020); Wu et al., (2020), focus more on the distribution of COVID-19.

This study focuses on the premise that industrial growth generates emissions in developed countries like Indonesia due to the effects of the country's economic progress (Mele & Magazzino, 2020). A serious economic recession has been triggered by tight regulation of movements and market practices due to the COVID-19 pandemic. Therefore, with the negative effect gained, it is hoped that there will be a positive aspect, namely environmental emissions due to continued industrial development that can be minimized (Mofijur et al., 2021). This research would extensively examine the global effects of the coronavirus pandemic on Indonesia's economy and the climate. For a secondary data analysis approach, this research employs descriptive quantitative approaches. It is hoped that this report will lead to the effect of the COVID-19 pandemic on the economy and the environment as an assessment material and recommendations for the government and other countries colonized by the coronavirus pandemic.

## 2. Literature Review

At present, thanks to the COVID-19 pandemic that has resulted in a slowdown in the global economy, economic development in different countries is in the media spotlight. In addition, this slowing economic development has been a hot subject about its present association with environmental quality. Kuznets principle, which notes that enhanced economic activity will increase environmental destruction and vice versa, is the underlying hypothesis.

In order to obtain a pertinent study, some of the literature related to this thesis was gathered. A research by Mele & Magazzino (2020) states that there is a strong causal correlation between economic growth and pollution in India after the start of the COVID-19 pandemic. The epidemic of COVID-19 is often referred to as an unprecedented occurrence that has affected global economic activity and caused some environmental impacts (Wang & Su, 2020). Wang & Su (2020) stated in their study that the COVID-19 epidemic is improving China's air quality in the short term and contributing substantially to reducing carbon emissions. This cannot, though, be proven in the long run, as China will lift the operation prohibitions and resume large-scale manufacturing operations, and it is possible that greenhouse gas emissions will again be polluted.

To limit the transmission of the coronavirus, countries around the world have introduced social controls and travel bans. This constraint does, however, have a dramatic impact on the economic market. The social limitations imposed by most countries have a positive environmental impact (Muhammad et al., 2020). W. L. Cheng et al., (2020) published a related study that focuses more on the Province of China. Then, a report by Wang & Su (2020) using a different approach investigates the impact of lowering pollution during the COVID-19 pandemic due to decreased economic activity. Becchetti et al., (2020), which reflects further on the relationship in Italy between the economy, air quality, and the pandemic of COVID-19.

This study will concentrate more on the country of Indonesia, based on the literature collected, with a different focus on different nations and different approaches. Where, in fact, economic growth continues as a world that is still evolving and still going on. This study would review in-depth secondary data gathered in order to assess the effect of COVID-19 on Indonesia's economy and environmental quality.

### **3. Research Method**

#### **Data and variables**

This research uses qualitative evidence gathered from a variety of authoritative sources, such as studies released by a number of relevant agencies, as well as interview findings and comments published by a number of media outlets. These data include the Indonesian Central Bureau of Statistics, the Bank of Indonesia, the World Bank, the Department of Meteorology, Climatology and Geophysics, the COVID-19 Front Force Handling Team, and media such as CNBC, Kompas, and other related scientific institutions. The effect of the coronavirus pandemic assault on the Indonesian economy and climate will be examined in this report. This analysis would reflect on the changes that have arisen due to the pandemic of Covid-19. These changes include environmental changes assessed on the basis of air quality and emissions of pollution, such as NO<sub>2</sub>. Economic development is then measured on the basis of reports released by many different agencies, such as data from the national GDP. In addition to these results, the analysis also briefly presents data on the number of cases of coronavirus infection in Indonesia from records from the frontline coronavirus control unit in Indonesia.

#### **Descriptive qualitative research**

This analysis employs descriptive techniques in qualitative testing. By using some qualitative data, which is then descriptively defined, this method of analysis attempts to analyze a problem, occurrence, phenomena, or social condition. Since analysis is a mixture of a descriptive and qualitative study with this kind of process. This analysis would present the original data findings collected without data manipulation or any treatment from many relevant sources that will alter the details. Since this analysis is meant to explain and thoroughly define the social climate and illustrate a pattern that is occurring today. For this purpose, this study uses descriptive qualitative approaches that seek to create an accurate impression and offer inconsistent details about the topic of the research. Furthermore, this analysis, both interprets and interprets current evidence pertaining to the present situation. For this purpose, without having a certain mechanism or manipulation of the variables and data being analyzed, this analysis would define the circumstances as they are.

There are many types of approaches to qualitative methods of description. Researchers preferred to use a phenomenological approach in this analysis. A phenomenological method is an approach that uses observational evidence that is evaluated without altering the validity of the data from many outlets. In the form of numbers and pictures, this study uses certain qualitative data which is then interpreted and presented in conjunction with the data gathered from the field. Phenomenological research, in theory, is research on human experiences, including persons and classes of actual events that have happened or have occurred. The phases of phenomenological research include identifying a phenomenon that becomes a topic to be studied, ensuring that the problem is sufficient for phenomenological research, assessing the focus and context of the study, gathering data from different empirical sources, evaluating existing data, and providing the analysis in the form of figures, pictures, or diagrams with the inclusion of existing data.

Pictograms, pie charts, bar or line charts, and frequency distribution tables will be provided with the details from the research in this report (McNabb, 2015). In order to get conclusions that address the questions being analyzed, the findings of the research study will be discussed and explained in-depth, straightforward, and in detail. Since this analysis is also observational of nature, aiming at documenting and interpreting, and evaluating this thesis on the basis of the evidence that exists. Laake & Benestad, (2015) note that the purpose of quantitative descriptive analysis is to collect knowledge about specific circumstances or circumstances that are then evaluated in the study for their relationship with variable data.

#### 4. Results and Discussion

##### Context to the Indonesia corona virus

In December 2019, China was surprised by the outbreak of the coronavirus which caused the death rate in Wuhan to skyrocket. In March 2020 the coronavirus started to enter Indonesia. The Indonesian government has made a variety of attempts since then to deter the transmission of the virus. The society and government have made numerous policies and efforts, such as the duty to wear masks as a means of conformity with health protocols, Large-Scale Social Controls (PSBB), the school from home, to working from home. These efforts were not, however, capable of stopping the transmission of the coronavirus in Indonesia. Information on confirmed COVID-19 cases in Indonesia is as follows:

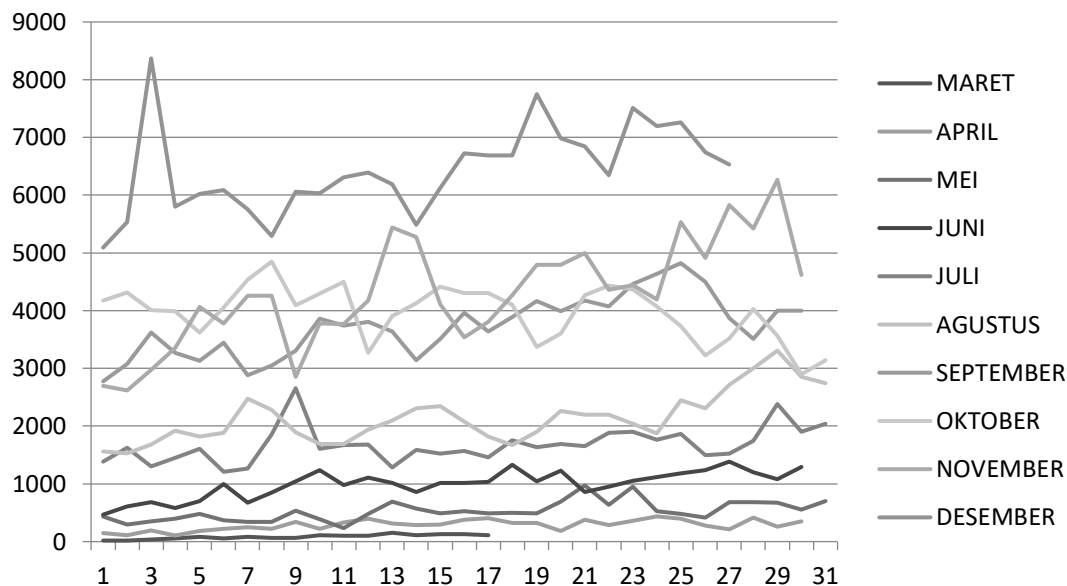


Figure 1. Indonesia Confirmed COVID-19 Graphics  
Source : Data that has been analyzed/www.covid19.go.id

The propagation of the coronavirus in Indonesia has so far not been monitored, based on the data in Figure 1. Data continued to rise from March until December 27, 2020. The number of the population confirmed to be infected with the coronavirus is rising day by day, according to the regular update of the COVID-19 Task Force. The government continues to take precautions in order to lower the spread rate. These initiatives, however, have an effect on inhibiting economic turnover.

##### Effect on the economy and environmental quality of the COVID-19 pandemic

###### Reduction of economic activity

As part of its attempts to limit the spread of COVID-19 in Indonesia, the government has released a new law, Large-Scale Social Controls (PSBB). These efforts, however, have had a serious effect on the Indonesian economy. Minister of Finance Sri Mulyani said that not only in Indonesia but in almost all countries affected by COVID-19, the PSBB had an impact on economic contraction. PSBB started in Indonesia at the end of March 2020, when economic growth began to contract to hit -5.32 percent in the second quarter of 2020 (CNBC, 2020). This negative growth indicates that economic activity has declined in different ways in terms of production, consumption, investment, exports, and government activities.

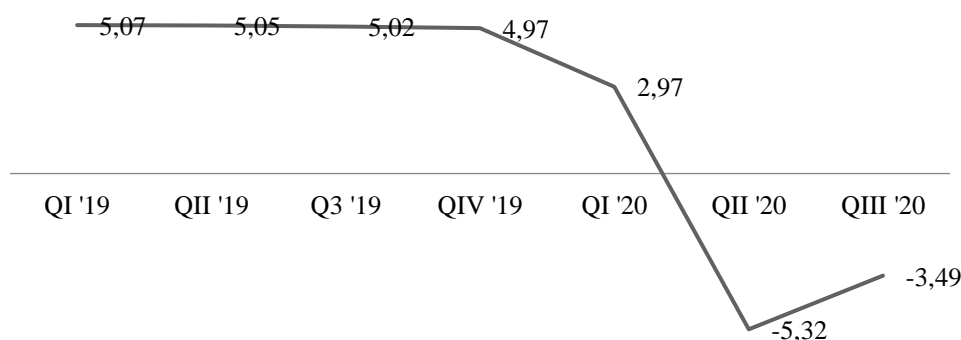


Figure 2. Indonesian Economic Growth  
Source: Central Bureau of Statistics Republic of Indonesia

Based on the graph figure 2, it can be seen that the economic growth of Indonesia continued to decline from Q1 2019 to QIII 2020. The Central Statistics Agency (BPS) reported that the gross domestic product (GDP) was already down by -3.49 percent in the third quarter of 2020 (y-o-y). This places Indonesia in a slowdown. Indeed, Indonesia also reported negative growth in the second quarter of 2020. Even then, economic growth could rise marginally in the third quarter of 2020, relative to the previous quarter.

PSBB has also had a major impact on micro and small businesses, due to regulations that impose restrictions on operating hours. In addition, many companies have laid off employees on a large scale due to a decline in business due to the COVID-19 pandemic. These are some of the problems that have resulted in the economic downturn in Indonesia. The COVID-19 pandemic has also increased the number of unemployed in Indonesia, besides that there have also been business bankruptcies in several sectors. So that in this pandemic many countries cannot avoid a recession.

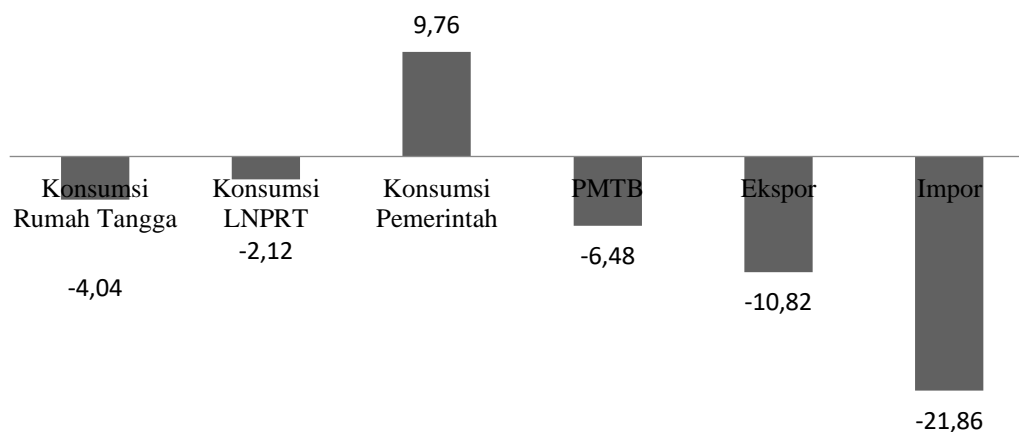


Figure 3. Gross Domestic Product by Expenditure  
Source : Central Bureau of Statistics Republic of Indonesia

The only good indicator, judging by the economic growth rate, was government consumption, which rose to 9.76 percent. In comparison, expenditure-based GDP growth (y-o-y) is labeled as a minus. The shipping and warehousing industries are other aspects impacted by the introduction of the PSBB in Indonesia. Other things that are affected by the implementation of PSBB in Indonesia are the transportation and warehousing sectors. Likewise, the export and import sectors also declined due to the Covid 19 pandemic. All economic activities were restricted, so that export and import activities were also limited, this resulted in a decline in both sectors. Household consumption during the Covid pandemic has also decreased, due to the application of social restrictions and the number of cases of massive employee layoffs.



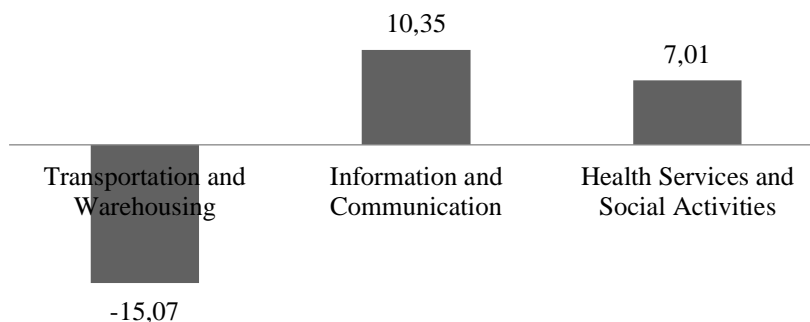


Figure 4. Gross Domestic Product in Several Business Field  
Source: Central Bureau of Statistics Republic of Indonesia

The diagram figure 4 suggests a decrease of -15.07 percent in the transport and warehousing market. This is because, both inside and outside the world, the government still imposes travel restrictions. As a result of the introduction of large-scale social controls in many regions in Indonesia, the transportation market has also deteriorated. Due to the introduction of guarding distances between persons, the amount of passenger ability and operating hours for both ground, air and sea transport are limited. Owing to travel restrictions both domestically and internationally, some transport had to avoid running as well. Other than that, the closing of most of the operating operations of visitor attractions is another factor in the downturn in the transport industry. In this way, the transport sector contributed significantly to the contraction in the economic growth of Indonesia during the Covid-199 period. While there was a reduction in transportation and warehousing (c-o-c), there was a small rise in the information and communication field and in health care. There are also other economic operations, aside from these industries, that are often hindered, such as the manufacturing sector. Many firms also stopped production and have carried out major layoffs, resulting in a rise in the unemployment rate during this pandemic period.

#### The pandemic of COVID-19, the economy and the environment

Most transport and local companies have been temporarily halted after the COVID-19 pandemic struck Indonesia in order to deter the growing dissemination of the coronavirus. As a consequence of the COVID-19 pandemic, Indonesia has seen several negative impacts. This has, however, little positive effect on the resilience and quality of the atmosphere, especially on clean air from emissions.



Figure 5. Road Conditions in Jakarta  
Source: Tambunan, 2020.

The status of the roads and high-rise buildings in Jakarta before and after the pandemic can be seen in Figure 5. Large-scale social pressures have had a negative effect on the economy, but environmentalists contend that during the PSBB introduction, air quality increased in Jakarta. This is mirrored in the decrease in pollutant gases, with the decrease in the number of road transport activities, as well as the decrease in the number of waste plants operating during the PSBB time.

PSBB in Indonesia not only prevents the acceleration of the spread of the corona virus, but also restores air pollution that occurs on the streets due to congested transportation, especially in Jakarta. One of the impacts of the PSBB was the work from home and school from home which resulted in fewer vehicles on the roads. This is a small solution to fixing air pollution that has been happening so far. The reduction in air pollution provides little support for the restoration of air conditions in Indonesia. This is expected not only during the Covid pandemic, but transportation restrictions can be applied after this pandemic ends. So that air quality, especially in Indonesia, is well maintained.

Indeed, the decrease in the transport industry due to the adoption of large-scale social constraints has had a negative effect on the Indonesian economy. However, this has a positive effect on the health of the ecosystem and the air. The majority of shipping temporarily ceases running. Owing to the absence of traffic driving by, the streets of major cities are quiet and cool. In order to improve the quality of the air due to decreased emissions from these cars. This is a small increase in air quality and a decline in traffic emissions caused by previously unrelenting car exhaust.

Not just Indonesia, global carbon dioxide emissions has also decreased due to the quarantine placed in numerous countries since COVID-19. The Center for Clean Air and Energy Analysis (CREA) reports that almost half, that is, 43 percent of the decline in global pollution happened at the height of the lockdown. Where the partial cessation of transport and manufacturing operations has taken place. Centered on the conclusions of a report undertaken by Chinazzi et al., (2020), shows that implementing a travel ban is an effective way to prevent the spread of the corona virus, as well as improve air quality and the environment that has been polluted as a result of continuous economic development.

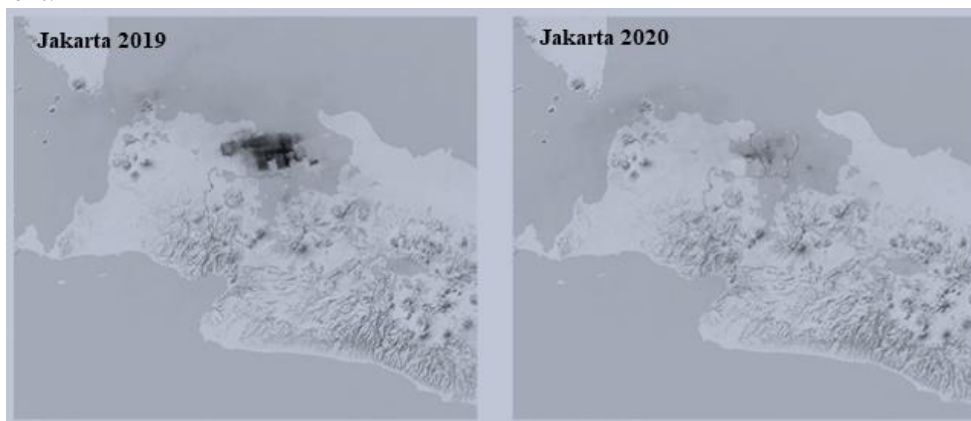


Figure 6. Jakarta Air Condition from Satellite  
Source: Satellite Satinel 5p

The satellite photo shows a drop in emission levels of nitrogen dioxide in Indonesia. This was attributed to a reduction in the operation of waste factories and road transport due to the PSBB's introduction in different areas. In the vicinity of the source of the coronavirus outbreak, namely in Jakarta and surrounding areas, decreases in the levels of nitrogen dioxide and harmful gases emitted by industrial vehicles and plants can be seen.

There has been a positive impact due to this pandemic, among others by improving the temperature in the air which has been polluted. In addition, there is a reduction in traffic jams due to the work from home policy. From here it is not only physical health that must be maintained, but environmental health must also be considered. Because with a healthy environment, a sustainable economic development process will be guaranteed.



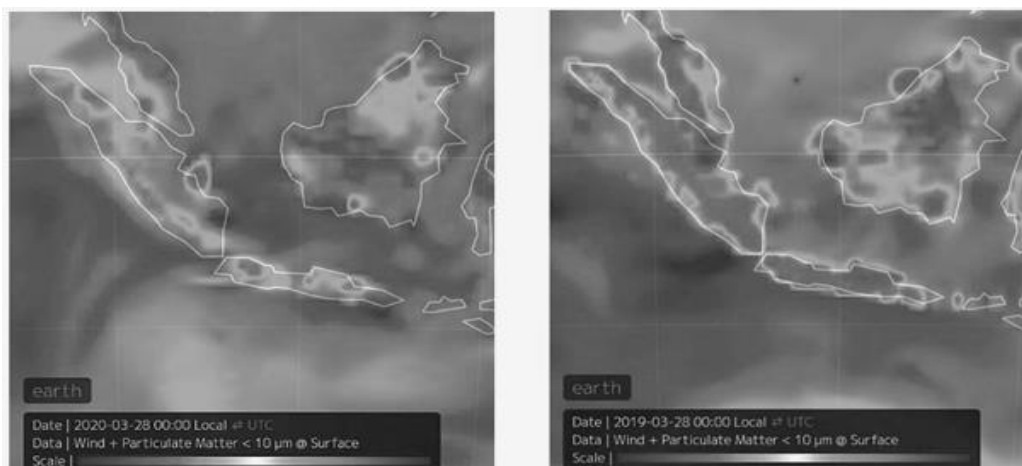


Figure 7. Today's assessment of the weather in Indonesia to a year earlier  
Source: lapan.go.id

There is evidence that air quality has greatly improved since the COVID-19 pandemic in most areas of Indonesia. In Indonesia, the Indonesian National Aeronautics and Space Agency (LAPAN) tracks and assesses air pollution. LAPAN released a report on the comparison of surface water and air quality in 2019 and 2020. Figures 6 & 7 show the results of air quality assessments in several regions in Indonesia in April 2019 and April 2020.

Based on the picture above, it is evident that the environment also needs a break to improve its quality. The better the quality possessed by the food environment, the more it will ensure the sustainability of economic development, especially those that require a lot of natural resources. Because environmental damage and deteriorating air quality resulting from industrial waste will only reduce the availability of natural resources whose existence is very supportive of economic development. Therefore, it is not only the negative impacts that are received by the world as a result of the Covid 19 pandemic, but some positive impacts are also obtained by the environment.

Based on the analysis of the data that has been collected, it can be stated that economic growth is closely related to environmental quality. Because economic development that is continuously carried out has an impact on decreasing environmental quality. This proves the correctness of the theory stated by Kuznet, that along with the process of increasing economic growth the quality of the environment will decrease, but as economic growth has increased, the quality of the environment will again increase over time.

## 5. Conclusion

This research comprehensively analyzes, from a spatial and temporal viewpoint, the short-term effect of COVID-19 on the economy and climate in Indonesia. The following results can be drawn based on the outcomes of the research of this study. In the short term, the COVID-19 epidemic strengthened air quality in Indonesia and led greatly to the reduction of global pollution. Exports, imports, and other economic sectors suffered a substantial downturn and resulted in negative growth in the two-quarters of the economy, depending on the time dimension of the manufacturing market. This shows that the economic growth downturn arising from the COVID-19 pandemic will save short-term air and environmental conditions.

It is hoped that maintaining the quality of the environment and air, especially in Indonesia, will be maintained even though the Covid 19 pandemic has ended. It is hoped that the government will continue to implement a policy of restricting transportation so as not to cause excessive air pollution. As well as the application of environmentally friendly industries, so that the waste produced does not

damage the environment which results in depletion of natural resources. So that economic development can still be carried out in a sustainable manner.

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