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DETERMINANTS OF ECONOMIC GROWTH INFLUENCED BY CLIMATE CHANGE

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Abstract : *Climate change is a major issue since it is intimately linked to economic activities that influence the rate of economic growth. The reason for this research is that climate concerns are worsening and affecting economic sectors all over the world, particularly in Asia (Indonesia, Philippines, Thailand, Japan, and China) and Europe (Norway, Austria, Hungary, Ukraine, and Italy). This is what will have an impact on future economic activity. As a result, it will slow the country's economic growth. Based on this occurrence, researchers wish to know the influence of climate change with indicators of increasing earth temperature, carbon dioxide (**OO** 2), methane (**OT** 4), and average rainfall on agricultural, fisheries, and forestry sectors simultaneously or separately. The impact of rising global temperatures, CO2 levels, methane levels, and average rainfall on economic growth. The Quantitative Method was utilized in this study, with data obtained from a second party (secondary) in the form of panel data processed using Eviews9 software. This study used the causal step technique, which involves employing mediating factors to construct a regression equation. The causal step technique is based on three regression equations for mediating variables, which can be stated as perfect mediation or partial mediation.*

Keywords : *Economic Growth, Climate Change, Global Warming,*

1. Introduction

High economic growth can be encouraged by a well-implemented and sustainable economic development process, the benefits of which can be shared by the entire community. As a result, Economic Growth is a critical measure of a country's economic health. Economic growth is the amount of economic activity that can provide additional money or welfare for society within a certain period of time, which shows that the economy of a country or region is experiencing successful progress (Yunianto, 2021). An economy is said to be growing if its output has increased compared to the previous year.If the quantity of goods or services produced decreases, then a country's economic growth will stagnate and be hampered. Then, various countries face the challenge of increasing global warming which causes climate change, resulting in decreased productivity in these countries.

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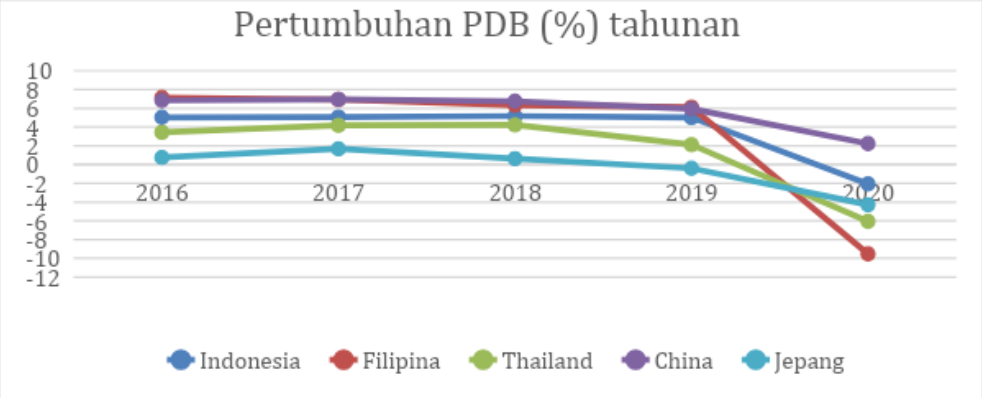
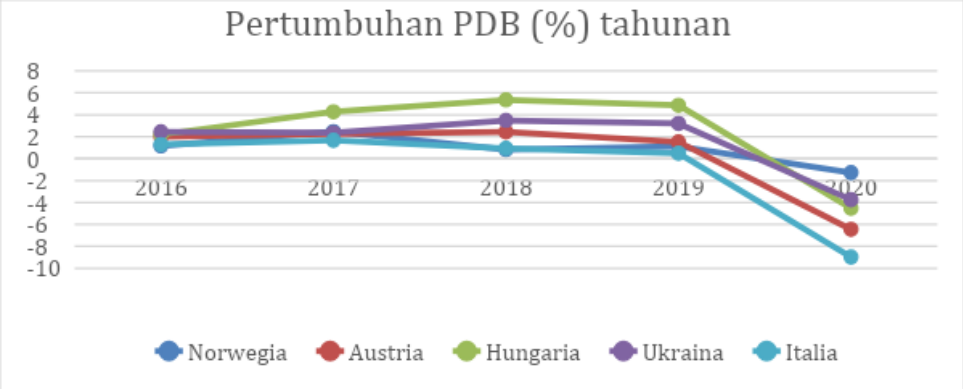


Graph 1 Asian Economic Growth 2016-2020

Source: World Bank (Data Processing)

Graph 1 depicts Asia's economic growth from 2016 to 2020. Based on this data, the Philippines had the highest economic growth in 2016 among four other countries, with a value of 7.14945675. In 2017, China obtained the largest figure of 6.947200793, while Japan obtained the lowest figure of 1.675331752. Then in 2018 the highest achievement was still achieved by China with the number 6.749773832. Alternately, in 2019 the Philippines became the country with the highest economic growth with a figure of 6.118525662, while Indonesia and Thailand were in the middle of Indonesia with a figure of 5.01928768 and Thailand with a figure of 2.114557796. In 2020, China had the highest economic growth which reached 2.238638356, then the second highest economic growth was owned by Indonesia with a figure of -2.065511829, while the Philippines dropped drastically and became the country with the lowest economic growth in 2020 with a figure of -9.51829474. Each country has different increases and decreases each year. This can also be influenced by several factors that exist in that country.



Graph 2 European Economic Growth 2016-2020

Source: World Bank (Data Processing)

In Graph 2 it can be concluded that Economic Growth in Europe in 2016, Ukraine had the highest economic growth among 4 other countries reaching 2.44098194492067. Then in 2017, Hungary experienced an increase to reach 4.27197601620695 and became the country with the highest economic growth and Italy had the lowest economic growth with a figure of 1.66785904106857. In 2018 - 2019, Hungary was still in the top ranking with the highest

economic growth, Ukraine was in second place with the number 3.19950386354134, the country with economic growth in third place was Austria with the number 1.51738858303159 and in fourth place was the country of Knowergia. with an Economic Growth figure of 1.12374696436403. In 2020, Knowergia had the highest economic growth, reaching -1.2781717845226, while Hungary fell to third place.

In industrial energy consumption, petroleum is the main source used as fuel, which produces large amounts of dangerous pollutants such as carbon dioxide (CO2) and methane (CH 4) and causes global warming. Global warming can cause changes in climate patterns which have many negative impacts, climate change will increase the frequency and intensity of extreme weather events, change rainfall patterns, global food crisis, increase in earth's surface and sea surface temperatures, air and water pollution and drought. If this happens continuously, it is certain that environmental conditions will get worse. This negative impact will also have a sustainable impact on natural order patterns, the economy and society in meeting life's needs. The increase in disasters due to climate change such as floods, droughts and hurricanes will cause an economic deficit because the government needs to spend a budget to cover losses caused by these disasters (Kompas et al., 2018).

A study conducted by the US national space agency, NASA, showed that 2016 ranked as the hottest year ever recorded on planet Earth. The hottest temperatures in Europe have reached 11–12 degrees Celsius over the last twenty years. However, the results of long-term analysis show that over the last forty years, there has been warming. The results of research by climate scientists show that climate change that is occurring, both in Europe, Asia and throughout the world, can have an impact on human health and the global economic sector in the long term. Researchers believe that Europe is close to reaching the upper threshold of the 2015 Paris Agreement standards, which aim to keep global average temperatures below two degrees Celsius. A major heat wave has hit the southern United States, the Mediterranean, North Africa, the Middle East and several Asian countries, including China.

Several previous studies argued that if global warming increases every year it will affect the economic growth of many sectors. This is a serious concern because many economic sectors depend on the climate to continue running so that changes in climate conditions will influence changes in economic activity (Sangkhaphahan & Shu, 2019). Because the impact of climate change on society, the economy and the environment is becoming increasingly real and significant. Climate change that occurs continuously will certainly have an impact on various aspects of life, such as climate change which causes continuous heavy rain in one area, while other areas experience a water crisis (drought) which has an impact on decreasing the quality of clean water. . Based on global phenomena related to climate change, this article will discuss the influence of climate change on economic growth in the Asian Continent (Indonesia, Philippines, Thailand, China and Japan) and the European Continent (Norway, Austria, Hungary, Ukraine and Italy). What is different from previous research is that this research will discuss the factors that cause climate change so that it affects several sectors in building economic growth.

Economic growth

Economic growth is closely related to economic development, unsustainable and carbon-intensive economic development has a negative impact on the environment, health and the economy (Lamb and Minx, 2020). This will also hamper sectors that drive economic growth. Economic Growth is used in a country to describe the country's economy. Adam Smith explained classical economic theory by saying that economic growth is influenced by two components,

namely overall production growth and population growth. The more output a country produces, the greater its productivity and population growth, which indicates an increase in people's purchasing power and consumption.

Climate change

Climate is the average weather pattern in a particular area over a long period of time and its nature continues to change over time. Climate change is a phenomenon in the form of changes in temperature, pressure, wind speed and rainfall on a large scale which can affect the condition of the earth (Takahashi et al., 2020). The impacts of climate change currently occurring due to global warming include the melting of polar ice, increasingly frequent and widespread forest fires, more frequent extreme weather events such as hurricanes, and many weather anomalies (Jorquera, Montoya, and Rojas, 2019). In addition, the impact of climate change throughout the world causes the economy to become hampered and unable to run well (Fowler et al., 2020). Current climate changes such as rising global temperatures, rising sea levels, changes in weather anomalies, and the increasing number of extreme weather events in the world are causing changes in human economic conditions and all economic sectors can be affected (Monge and McDonald, 2020). From the theory above, it can be concluded that climate change can worsen the economic situation of a country because of the impacts it causes.

Global Warming on Economic Growth

Global warming is a form of imbalance in the ecosystem on earth due to the process of increasing the average temperature of the atmosphere, sea and land on earth. By using historical data it can be proven how temperature changes can impact economic growth (domestic, cross-country and international economic activity variables). According to Hsiang (2022), although temperature changes occur gradually, small changes will have a big impact on the world. The earth's temperature is currently increasing from year to year and the rate of increase, which was initially very small, is becoming increasingly high so that the signs of global warming are becoming very easy to recognize (N. Zhang et al., 2020). Increasing Global Warming can cause disasters such as hurricanes, droughts and forest fires. This disaster can damage infrastructure, eliminate natural resources, disrupt economic sectors such as agriculture, fisheries and forestry, eliminate livelihoods, and require large costs for recovery and reconstruction. This will certainly have a big impact on the community's economic sector(Fath, nd. 2021).

2. Research methods

This research uses quantitative methods using secondary data collected from World Bank indicators found in Worldbank, NASA, NOAA, Databoks, Websites and previous research. This research uses panel data collected from cross-sectional data, which includes five countries in Asia and five countries in Europe, as well as time series data, which runs from 2016 to 2020. Researchers have limitations with the data provided by the World Bank, so This research only ended in 2020. This research was conducted in five Asian countries (Indonesia, the Philippines, Thailand, China and Japan) and five European countries (Norway, Austria, Hungary, Ukraine and Italy) for five years.

The analysis used in this research is multiple linear regression analysis using the causal step method by using mediating variables to form a regression equation. This regression analysis is used to see the significant influence using the variables:

1. The dependent variable is economic growth.

2. Independent variables are rainfall, increase in earth temperature, carbon dioxide and methane.
3. Mediating variables are Agriculture, Fisheries and Forestry.

The initial steps in determining the Causal Step Method are:

1. Determine the regression equation for the independent variables Carbon Dioxide, Methane, Rainfall, Earth Temperature on the dependent variable Economic Growth.
2. Determine the regression equation for the independent variables Carbon Dioxide, Methane, Rainfall, Earth Temperature on the dependent variable Agriculture, Fisheries and Forestry.
3. Determine the regression equation for the independent variables Carbon Dioxide, Methane, Rainfall, Earth Temperature on the dependent variable Economic Growth by including the variables Agriculture, Fisheries and Forestry.
4. Make a conclusion whether the Agriculture, Fisheries and Forestry variables are perfect mediation or partial mediation.

Make a conclusion that the Fisheries, Agriculture and Forestry variables are referred to as mediating variables if they meet the following criteria:

1. In equation I, the independent variables Carbon Dioxide, Methane, Rainfall, Earth Temperature have a significant effect on the dependent variable Economic Growth.
2. In equation II, the independent variables Carbon Dioxide, Methane, Rainfall and Increase in Earth's Temperature have a significant effect on the variables thought to be mediating variables for Fisheries, Agriculture and Forestry.
3. If equation III, the variable which is thought to be the mediating variable Agriculture, Fisheries and Forestry has a significant effect on the dependent variable Economic Growth.

So we can form the following regression model:

1. Determining model I: Economic Growth $= \beta 0 + \beta 1$Carbon Dioxide, Methane, Rainfall, Earth Temperature.
2. Determining model II: Economic Growth $= \beta 0 + \beta 1$Carbon Dioxide, Methane, Rainfall, Earth Temperature.
3. Determining model III: Economic Growth $= \beta 0 + \beta 1$ Carbon Dioxide, Methane, Rainfall, Earth Temperature $+\beta 2$ Agriculture, Fisheries Forestry

With mediating variable regression analysis criteria:

1. The Agriculture, Forestry and Fisheries variables are called perfect mediating variables if the influence of the independent variable and the dependent variable before the Agriculture, Forestry and Fisheries variables is significant, so that after using the Agriculture, Forestry and Fisheries variables in the regression model the influence of the independent variable and the dependent variable becomes insignificant.
2. The Agriculture and Forestry Fisheries variables are called partial mediating variables if the influence of the independent variable with the dependent variable before the Agriculture and Forestry Fisheries variable is significant, so that after entering the Agriculture and Forestry Fisheries variables into the regression model the influence of the independent variable and the dependent variable remains significant.

3. Results and Discussion

3.1. Results

Table 1. Descriptive Statistics

Variable	Year	Means
Earth Temperature	2016	1.02
	2017	0.92
	2018	0.85
	2019	0.98
	2020	1.02
methane	2016	169320.8069
	2017	171106.6467
	2018	174986.4838
	2019	176452.7363
	2020	178204.6802
Co2	2016	1141622.895
	2017	1166388.838
	2018	1220028.674
	2019	1242969.630
	2020	1249386.862
rainfall	2016	1349.5
	2017	1349.5
	2018	1349.5
	2019	1349.5
	2020	1349.5
economic growth	2016	3.230988057
	2017	3.782311386
	2018	3.616265074
	2019	2.998876615
	2020	-4.469031915
Fisheries, Agriculture and Forestry	2016	121864466028.210
	2017	124811722387.765
	2018	131246970126.855
	2019	136259911935.232
	2020	147765538612.813

From Table 1, it can be seen that the average of Methane, CO2, Fisheries, Agriculture, Forestry in five European countries and five Asian countries in 2016-2020 has increased. Meanwhile, the average economic growth has decreased from 2016-2020. Rainfall in 2016-2020 tends to be constant. Earth's temperature decreased in the 2016-2018 period and increased in 2018-2020.

Parameter estimation and parameter testing

Decrease in Rainfall, CO2, Methane, and Earth Temperature inFisheries, Agriculture, Forestry

Table 2. Estimated Results for Rainfall, CO2, Methane and Earth TemperatureFisheries, Agriculture, Forestry

Parameter	Parameter Estimation
Constant	6,855
Rainfall	-0.162
co2	-0.094
Methane	0.993
earth temperature	-0.177

From the regression model in Table 2, it can be seen in the following equation:

Agriculture, Fisheries, Forestry = 6.855 -0.162 Rainfall -0.094 co2 + 0.993 Methane -0.177 earth temperature

In simultaneous testing, the p-value was obtained at (0.000) < α (0.05) so that H0 was rejected so it was concluded that the regression model was suitable for predicting the variables Rainfall, CO2, Methane and Earth Temperature inFisheries, Agriculture, Forestry. In the partial test of the constant, Co2, and Methane, it was obtained that the p-value < α (0.05) so that H0 was rejected so it could be concluded that there was an influence of the constant, Co2, and Methane onFisheries, Agriculture, Forestry. Meanwhile, for the Rainfall and Earth Temperature variablesIf the p-value > α (0.05), then H0 is accepted so it can be concluded that there is no influenceRainfall and Earth's TemperaturetoFisheries, Agriculture, Forestry.

SetbacksFisheries, Agriculture, Forestry on Economic Growth

Table 3. Variable Estimation ResultsFisheries, Agriculture, Forestry on Economic Growth

Parameter	Parameter Estimation
Constant	0.575
Fisheries, Agriculture and Forestry	-1506.155

From the regression model in Table 2, it can be seen in the following equation:

Economic Growth = 0.575 -1506.155 Agriculture, Fisheries and Forestry

In simultaneous testing, a p-value of (0.03) < α (0.05) was obtained so that H0 was rejected, so it was concluded that the regression model was suitable for use to predict variables.Fisheries, Agriculture, Forestry on economic growth. In partial constant testingFisheries, Agriculture, ForestryIf the p-value < α (0.05) is obtained then H0 is rejected so it can be concluded that there is a constant effectFisheries, Agriculture, Forestrytoeconomic growth.

A country's economic growth is influenced by many factors, including changes in key sectors such as fisheries, agriculture and forestry. Under the influence of climate change, these three sectors face serious challenges that could hinder economic growth.

Fisheries is one of the important sectors affected by climate change. Rising sea temperatures, ocean acidification, and changes in ocean current patterns have changed the distribution and abundance of fish species. This results in a decrease in fish catches, disrupts food availability, and harms fishermen's livelihoods. The decline in fisheries production also has an impact on international trade and state income from fishery product exports.

Agriculture is also affected by climate change. Rising global temperatures, changing rain patterns, and changes in weather extremes such as drought or floods can damage agricultural yields. Plants become vulnerable to new pests and diseases due to climate change. This results in a decrease in food crop production, which has an impact on a country's food security and the welfare of farmers.

Forestry also faces serious challenges. Illegal logging, frequent forest fires and changes in rain patterns have an impact on forest sustainability and biodiversity. Forest loss results in ecological and economic losses, including loss of natural resources, reduced oxygen availability, and reduced employment opportunities in the forestry sector.

These negative impacts on the fisheries, agriculture and forestry sectors have the potential to hamper a country's economic growth. Decreased production, loss of jobs and economic losses caused by climate change in these three sectors can hamper potential economic growth.

Therefore, protection and adaptation to climate change are important to mitigate these negative impacts. Efforts to protect the environment and conserve natural resources must be increased. Additionally, innovative research and the application of environmentally friendly technologies in these sectors can help reduce vulnerability to climate change.

In an effort to face this challenge, collaboration between countries and sustainable policies are the keys to achieving stable economic growth while paying attention to environmental sustainability. By overcoming the impact of climate change on the fisheries, agriculture and forestry sectors, it is hoped that a country's economic growth can be maintained in the long term.

Testing Assumptions in the regression model (1) Variables Rainfall, CO2, Methane and Earth Temperature onFisheries, Agriculture, Forestry

Table 4. Testing Multicollinearity Assumptions

Variable	VIF
Rainfall	1.162105
co2	1.471809
methane	1.40385
earth temperature	1.00028

In Table 4, it can be seen that Rainfall, CO2, Methane and Earth's temperature have a VIF < 10 so it can be concluded that there is no multicollinearity between the independent variables. Next, the assumptions of heteroscedasticity, autocorrelation and normality were tested

Table 5. Testing Assumptions on Rainfall, CO2, Methane, and Earth's TemperatureFisheries, Agriculture, Forestry

Test Assumptions	P-value	Conclusion
Normality	0.667	H0 failed to be rejected
heteroscedasticity	0.130	H0 failed to be rejected

In Table 5 it can be concluded that for testing the assumptions of normality, heteroscedasticity and i have been fulfilled.

Testing Assumptions in the regression model (2) Rainfall, CO2, Methane and Earth Temperature variablesFisheries, Agriculture, Forestry

Table 6. Testing Multicollinearity Assumptions

Variable	VIF
Fisheries, Agriculture, Forestry	1,000

In Table 6, it can be seen that Rainfall, CO2, Methane and Earth's temperature have a VIF < 10 so it can be concluded that there is no multicollinearity between the independent variables. Next, the assumptions of heteroscedasticity, autocorrelation and normality were tested

Table 7. Testing variable assumptionsFisheries, Agriculture, Forestry on Economic Growth

Test Assumptions	P-value	Conclusion
Normality	0.455	H0 failed to be rejected
heteroscedasticity	0.173	H0 failed to be rejected

In Table 7 it can be concluded that for testing the normality assumption heteroscedasticity and autocorrelation have been met.

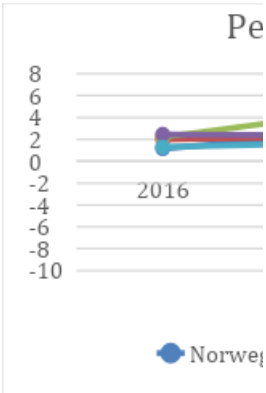
Coefficient of determination (R2)

Based on the results of the regression model analysis, the coefficient of determination (R2) value was 92.5%, meaning that the variations that occur in the Fisheries, Agriculture and Forestry sectors are caused by the variables Rainfall, CO2, Methane and Earth's temperature. Meanwhile, the remaining 7.5% was caused by other variables that were not analyzed. Meanwhile, in the second model, the coefficient of determination (R2) is 9.4%, meaning that the variations that occur in economic growth are caused by Fisheries, Agriculture and Forestry variables, while the remaining 90.6% is caused by other unrelated variables. analyzed.

Sobel test

Table 8. Sobel test

Variable	**Signature (Sobel)**



Rainfall	
co2	0.043
methane	0.026
earth temperature	0.838

Based on Table 8 above, the Co2 and Methane variables obtain a p-value < α (0.05), so H0 is rejected so it can be concluded that the variablesFisheries, Agriculture, Forestrycan mediate the influence of Co2 and Methane on economic growth. Meanwhile, for the Rainfall and Earth Temperature variablesIf p-value > α (0.05), then H0 is accepted so it can be concluded that the variableFisheries, Agriculture, Forestrycannot mediate the influence of rainfall and earth temperature on the economy. Growth.

3.2. Discussion

The results of data analysis show that there is a significant correlation between climate change and economic growth. There is empirical evidence that confirms that variables related to climate change, such as increases in average temperature, changes in rainfall patterns, and extreme weather events, significantly influence a country's economic performance. In the context of fisheries, data results show a significant decline in fish catches, especially in areas experiencing increased sea water temperatures or changes in ocean current patterns. This has a direct impact on fish production, reduces income from the fisheries sector, and affects the country's trade balance.

In the agricultural sector, data shows irregularities in rainfall patterns and periods of drought that impact crop productivity. This causes a decrease in agricultural yields, increases the risk of food shortages, and puts pressure on farmers' welfare and national food security.

In addition, data analysis also highlights the important role of forestry in economic growth. Reduction of forest area due to illegal deforestation or forest fires causes loss of natural resources, contributes to a decrease in air and water quality, and has a negative impact on the tourism sector and public health.

There is an urgent need for adaptation and mitigation policies that focus on affected sectors. Investment in environmentally friendly technology, promotion of sustainable practices in food production, and increasing the capacity of the fisheries, agriculture and forestry sectors are crucial to reducing vulnerability to climate change.

Apart from that, collaboration between countries in the climate change framework also plays an important role. Joint efforts to reduce greenhouse gas emissions, implementing international policies that prioritize environmental sustainability, as well as funding for developing countries to increase resilience to climate change need to be the main focus in efforts to maintain sustainable economic growth.

It is important to note that this study has certain limitations, such as limited historical data or variability in measurement methods. Therefore, more comprehensive further research is needed to better understand the dynamics of the relationship between climate change and economic growth as well as the influence of other variables that may play a role.

4. Conclusion

Based on the results of research conducted regarding the determinants of economic growth influenced by climate change in 5 European countries and 5 Asian countries in 2016-2020 using indirect regression analysis or mediating variable regression. then it can be concluded that:Carbon Dioxide (CO 2) and Methane (CH4) simultaneously have a significant influence on the agricultural, fisheries and forestry sectors. The simultaneous increase in earth temperature and rainfall does not have a significant impact on the agriculture, fisheries and forestry sectors. Partially, the agriculture, fisheries and forestry sectors have a significant influence on economic growth.

Reference

Adib, M. (2014). Global Warming, Climate Change, Impacts and Solutions in the Agricultural Sector. Journal of Bioculture, III(2), 420–429. www.tcpdf.org

Ahmad Ma'ruf. (2008). INDONESIA'S ECONOMIC GROWTH: Determining Factors and Prospects. Journal of Economics & Development Studies, 9(1), 44–55.

Ainurrohmah, S., & Sudarti, S. (2022). Analysis of Climate Change and Global Warming as a Critical Phase. Phi Journal Journal of Physics Education and Applied Physics, 3(3), 1. https://doi.org/10.22373/p-jpft.v3i3.13359

Arum, S., Yogyakarta, UM, Energi, P., & Asing, M. (2018). Determining factors of environmental changes in per capita income in ASEAN countries for the 2008-2018 period.

Bakhri, MS (2020). Energy Consumption, Economic Growth, Globalization and Emissions. Eleven March University, August.

Bloom, N., & Reenen, J. Van. (2013a). ANALYSIS OF DETERMINANTS OF ECONOMIC GROWTH IN 5 (FIVE) ASEAN COUNTRIES, 2005 - 2021. NBER Working Papers, 5, 89. http://www.nber.org/papers/w16019

Bloom, N., & Reenen, J. Van. (2013b). THE EFFECT OF CLIMATE CHANGE ON GROSS REGIONAL DOMESTIC PRODUCT OF THE AGRICULTURAL SECTOR. NBER Working Paper, XXIII(2), 89. http://www.nber.org/papers/w16019

Economics, PP, Processing, I., & Quality, T. (2022). carbon dioxide in Indonesia.

Empirical, S. (2023). The Effect of Environmental Reporting on Market Value with Customer-Related Performance.

Fath, M.A. (2021). Literature Review: The Effect of Air Quality and Climate Conditions on the Community's Economy. Literature Review: The Effect of Air Quality and Climate Conditions on the Community's Economy. Public Health Nutrition Media, 10(2), 329–342.

Febriyastuti Widyawati, R., Hariani, E., Lopa Ginting, A., & Nainggolan, E. (2021). Volume 3

Issue 1 July 2021 The Influence of Economic Growth, City Population, Openness to International Trade on Carbon Dioxide (Co 2) Emissions in ASEAN Countries. Jambura, 3(1 July 2021), 37–47.

Febryani, T. (2017). Determining Factors of Economic Growth in 4 ASEAN Countries. Journal of Applied Economics, 2(1), 10–20. https://doi.org/10.20473/jiet.v2i1.5501

Ichdayati, LI (2014). FARMERS' RESPONSE AND ADAPTATION TO CLIMATE CHANGE Abstract Lilis Imamah Ichdayati *. Farmer Response and Adaptation to Climate Change, 8(2), 155–170.

Illahi, RW, Syahputra, AF, Aida, GR, & Prajasti, CN (2023). The Effect of Climate Change on Capture Fisheries Production in the East Java Sea, Indonesia. Agrimanex Journal: Agribusiness, Rural Management and Development Extension, 3(2). https://doi.org/10.35706/agrimanex.v3i2.8684

Izza, MN, & Purnomo, D. (2024). Analysis of Economic Growth Patterns and Regional Potential Sectors in Grobogan Regency, Central Java, 2017–2021. 72–84. https://doi.org/10.2991/978-94-6463-204-0_7

Kulthum, FA, & Setyowati, E. (2024). Determination of Leading Sectors and Analysis of Economic Growth in the Former Pati Residency 2016–2020. Atlantis International Press BV. https://doi.org/10.2991/978-94-6463-204-0_52

Lim, S. Il, Park, DH, Lee, SJ, Han, SS, & Choi, MS (2007). Reliability Improvement Scheme for Substation Automation Systems Based on IEC61850. Control of Power Plants and Power Systems 2006, 207–211. https://doi.org/10.1016/B978-008046620-0/50035-9

Manurung, W., Fajar, M., & Noviar, N. (2022). Determining Factors of Economic Growth in Banten Province. Journal of Regional Development Policy, 6(2), 36–44. https://doi.org/10.56945/jkpd.v6i2.184

Mulyani, AS (2021). Global Warming, Causes, Impacts and Anticipation. Community Service Articles, 1–27.

Munawaroh, Yuniarti, D., & Nor Hayati, M. (2015). Regression Analysis of Mediating Variables using the Causal Step Method (Case Study: Gross Regional Domestic Product (GRDP) Per Capita in East Kalimantan Province 2011-2013). EXPONENTIAL Journal, 6(2), 193–199.

Nurbandi, W., & Astuti, IS (2019). Climate Change Study Viewed from the Influence of Per Capita GDP Levels on Co2 Emissions in Southeast Asia 1980 – 2014. Journal of Meteorology, Climatology and Geophysics, 5(3), 53–62. https://doi.org/10.36754/jmkg.v5i3.75

Nurhayati, D., Dhokhikah, Y., & Mandala, M. (2020). Community Perceptions and Adaptation Strategies to Climate Change in the Southeast Asia Region. Journal of Protection, 1(1), 39–44.

Panagos, P., Ballabio, C., Borrelli, P., Meusburger, K., Klik, A., Rousseva, S., Tadić, M.P., Michaelides, S., Hrabalíková, M., Olsen, P., Aalto , J., Lakatos, M., Rymszewicz, A., Dumitrescu, A., Beguería, S., & Alewell, C. (2015). Precipitation erosion in Europe. Total Environmental Science, 511, 801–814. https://doi.org/10.1016/j.scitotenv.2015.01.008

Panusunan Simanjuntak, P., & Safril, A. (2020). Future Trends in Rainfall and Extreme Air Temperatures (Period 2021-2030) based on Representative Concentration Pathway (RCP) 4.5 in Palu City. Journal of Physical Sciences and Innovation, 4(1), 1–11. https://doi.org/10.24198/jiif.v4i1.23846

Priyanto, MW (2021). The Effect of Climate Change on Gross Regional Domestic Product in the Agricultural Sector. Agritech: Journal of the Faculty of Agriculture, Muhammadiyah University of Purwokerto, 23(2), 91. https://doi.org/10.30595/agritech.v23i2.8879

Profile, VIEW (2023). The impact of risks related to climate change on the economy. July.

Rafly, M., Maulana, A., Deskar, D., Rahman, AF, Ramadhan, IF, Adha, A., & Attala, VD (2023). Analysis of the Influence of Globalization and Climate Change on the Sustainable Indonesian Economy. Publiciana, 16(1), 25–32.

Robbani, RI (2021). Analysis of the influence of service quality on customer loyalty with customer satisfaction as a mediating variable: Study at Ibunda Clinic. Thesis, 70 pages. http://etheses.uin-malang.ac.id/31665/

Sari, K., Wahyudi, ST, & Nabella, RS (2023). Determining Factors of ASEAN+5 Economic Growth: Environmental Aspects. Indonesian Journal of Economics and Development, 23(1), 15–29. https://doi.org/10.21002/jepi.2023.02

Tafeta Febriani and Sri Kusreni. (2019). Determining Factors of Economic Growth in ASEAN Countries. Applied Economics, 1, 9.

Main, K. (nd). Contact the Editorial Board.

Zakariya, H., Suparwi, Setyowati, R., Aditia, R., & Pratama, HN (2023). The Impact of Climate Change and Global Warming on the World Economy. Sultan Adam: Legal and Social Journal, 1, 288–297. http://qjurnal.my.id/index.php/sultanadam/article/view/540