Article category : International Trade

Economic Growth And Carbon Emissions In Asean-6 To Achieve Sustainable Development Goals Through Kuznet Curve Environmental Analysis Approach

Soeharjoto [1], Nabila Inas Salma [2], Debbie Aryani Tribudhi [3], Lalu Masyhudi[4]
[1,2,3] Faculty of Economics and Business, Universitas Trisakti, Jakarta, Indonesia
[4] Sekolah TInggi Pariwisata Mataram, Indonesia

ARTICLE INFORMATION

ABSTRACT

This study aims to determine carbon emissions in the Association of Southeast Asian Nations-6 (ASEAN-6) in achieving Sustainable Development Goals using the Kuznet environmental curve analysis approach. Used panel data regression method with carbon emissions as a dependent variable and Gross Domestic Product per capita, Squared Gross Domestic Product per capita, population, energy consumption and Sustainable Development Goals as independent variables. Used panel data from 2009-2018, samples taken from Singapore, Malaysia, Indonesia, Thailand, Philippines and Vietnam. Results are the suitable random effect model, with per capita Gross Domestic Product and energy consumption having a positive and significant effect on carbon emissions. In contrast, the squared Gross Domestic Product Per capita, population and Sustainable Development Goals have a negative and significant impact on carbon emissions. The Environmental Kuznet curve hypothesis has been proven in this area, although only Singapore has reached a turning point, so ASEAN-6 will still experience in carbon emissions increase. For this reason, ASEAN-6 needs to implement sustainable development policies, family planning, environmentally friendly energy development, and coordination and seriousness in implementing the Sustainable Development Goals.

Corresponding Author:

Soeharjoto
E-mail : soeharjoto@trisakti.ac.id

INTRODUCTION

Steam engine invention and increasing number of factory was the beginning of the industrial revolution [1]. This era, bringing big changes and externalities to human life and nature [2]. Industrialization has indirectly accelerated at increasing carbon emissions in addition to motor vehicles, livestock, and forest burning [3]. Increasing carbon emissions has an impact in air, retained by the atmosphere will result in climate change, and ultimately increase the earth's temperature [4]. This threat, made countries in the world aware and tried to reduce carbon emissions, by making the Paris Agreement [5]. This activity is an initiative from America and Europe as a developed countries in which is intended for all countries, by carrying out monitoring, reporting and climate improvement programs in a transparent manner. This agreement was included in the United Nations Framework Convention on Climate Change (UNFCCC) agenda and agreed by 195 countries at the 21st United Nations Climate Change Conference in Paris [6].

Economic growth is the result of the implementation of a country's development [7]. Overcoming unemployment, developing countries applied industrialization as the main thing [8]. Industrialization application without long-term planning will destroy nature. Environment needs to be preserved because its an important space for living things. Existence of pollution causes environmental damage and has an impact on climate change. As for the impact, it can reduce the activity and welfare of living things. To preserve the environment, United Nations issued an agenda for Sustainable Development Goals (SDGs). SDGs are development of the Millennium Development Goals (MDGs) by incorporating elements of environmental

sustainability, so that SDGs become a reliable program in economics development while maintaining environmental sustainability [9].

ASEAN located at Southeast Asia region, with main agenda of cooperation in political, economic, social and cultural fields [10]. Most members are developing countries with varying incomes. To improve peoples welfare, ASEAN carries out development, which has an environment impact. Cooperation between ASEAN countries are to reduce environmental damage, by reducing carbon emissions in Singapore, Malaysia, Indonesia, Thailand, the Philippines and Vietnam (ASEAN-6).

Gross Domestic Product (GDP) is country indicator of success economics [11]. High GDP indicates an increasing at people's purchasing power. This results is increasing number of goods consumption that are not environmentally friendly and ultimately results in environmental damage. Developed countries have an ability to increase economic growth by preserving the environment, because their communities have awareness and ability to buy goods which made from environmentally friendly raw materials. Continuous increase in human population, and increasing natural resources use, has an impact on the rapid decline in environmental quality. This occurs in countries that use fossil energy. Because requiring large amount of money, developing countries have not used environmentally friendly energy. To achieve sustainable development requires awareness and cooperation between government and the community.

ASEAN-6 is carries out sustainable development. This policy needs to be implemented because the development will have an impact around the region. In order

to prevent extreme changes in earth's temperature, it is necessary to collaborate in ASEAN-6, by reducing carbon emissions. For this reason, there is a research on the determination of carbon emissions in ASEAN-6 in achieving the Sustainable Development Goals with the Kuznet curve environmental analysis approach.

Economic growth and environmental quality are closely related [12]. This condition described in Environmental Kuznet Curve (EKC), which forms an inverted U-letter, because development undergoes three stages: pre-industrial economics, industrial economics, and post-industrial economics [13]. In short term, development will increasing economic growth, followed by increase in environmental damage to certain conditions at economic growth, then the cycle reverses in long term. Economic growth increase will make people more aware of environmental sustainability [14]. This theory is developed on the basis environmental quality demand to improve community welfare by implementing social regulation and supervision. For this reason, EKC hypothesis is used to prove the issue of environmental quality degradation in various countries. This hypothesis is not fully applicable in all countries, especially middle and low income.
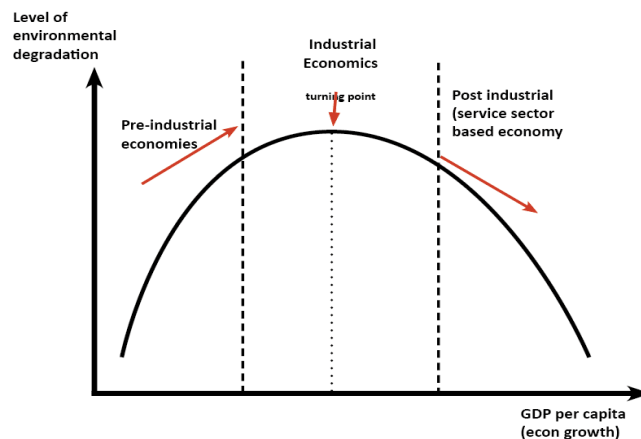

Figure 1. Environmental Kuznet Curve

EKC research has been carried out by several researchers using various variables and results (figure 1). GDP per capita at Indonesia has a positive and significant effect on carbon emissions [15], GDP per capita in East Africa, has a negative and significant effect on carbon emissions at long term [16]. Squared GDP per capita in European Union has a positive and significant effect on carbon emissions [17], squared GDP per capita in ASEAN region has a negative and significant effect on carbon emissions [18], but the results from high development countries (HDC), middle development countries (MDC), and low development countries (LDC) found that squared GDP per capita is not significant to carbon emissions [19]. Jugurnath & Emrith research (2018), in small island developing states (SIDS), revealed that the population had a positive and significant effect on carbon emissions [20], however Nikensari, Destilawati, & Nurjanah research (2019) and Trianto & Purwanti research (2018) in ASIA found that population has a negative and significant effect on carbon emissions [21, 22]. Saboori, Sulaiman, & Mohd research (2012), in Indonesia shows that energy consumption has a positive and significant effect on carbon emissions [23], while Tang's (2017) study shows that energy consumption has a negative and significant effect on carbon emissions [24]. Pratama's research at Indonesia (2020), find that SDGs

and MDGs in the short and long term have a negative and significant effect on carbon emissions [25], Research by Tjoek, & Wu (2018), find that EKC has been proven in ASEAN [26], while Darwanto, Woyanti, Santosa, Sasana, Ghozali research (2019), found that the EKC hypothesis was not proven in ASEAN [15].

Hypothesis:
Correlation between GDP per capita with carbon emissions.

Increasing of GDP per capita at ASEAN-6 will increase public consumption, so it will develop industrialization, resulting in an accelerated reduction in natural resources and an increase in carbon emissions, accordance with Darwanto, Woyanti, Santosa, Sasana, Ghozali (2019) research [15]. Hypothesis is GDP per capita has a positive and significant effect on carbon emissions.

Correlation between Gross Domestic Product with carbon emission.

The increase in ASEAN 6 squared GDP per capita will increase the country's income to the turning point and even some exceed it, thus increasing people's consumption. Companies trying to meet people's needs by produce environmentally friendly resources, because demand from the public due to public awareness of the environment, consequently, they want and be able to pay a higher price, thus lowering carbon emissions. This result is in accordance to Noor & Saputra (2020) [18].

Correlation between populations with carbon emission

Increasing population will increase community needs, and demand for goods and services,so companies strive to meet community needs by increasing production which increases demand for natural resources and carbon emissions in the ASEAN-6 region. Accordance with Jugurnath & Emrith (2018) research [20].

Correlation between energy consumption to carbon emission.

ASEAN-6 mostly not a developing country, so it has not developed environmentally friendly energy which can accelerate natural resources reduction and increase carbon emissions impact. Increasing energy consumption will increase the production and expansion of the energy industry.

Correlation between SDGs implementation to carbon emission.

According to Pratama (2020) research, SDGs agreement makes ASEAN-6 aware and compliant with importance of the environment, so countries seek efficient natural resources and environmentally friendly, which will reduce carbon emissions. Hypothesis is SDGs application negatively and significantly affects carbon emissions.[25]

RESEARCH METHOD

Research on carbon emissions determination in ASEAN-6 in achieving Sustainable Development Goals with Kuznet Curve Environmental analysis approach, conducted in 2009-2018 and using samples from Singapore, Malaysia, Indonesia, Thailand, Philippines, and Vietnam. Method uses panel regression data, with variables bound to carbon emissions and free variables in the form of GDP per capita, squared GDP per capita, population, energy consumption and SDGs.

$Carbon_{it}=\beta_0+\beta_1GDP$ per $capita_{it}+\beta_2GDP$ per $capita2_{it}+\beta_3POP_{it}+\beta_4Energy_{it}+\beta5SDGs_{it}+\varepsilon_{it}$ (1)

Description:
Carbon : CO2 gas emissions per capita (metric tons)
GDP per capita   : PDB per capita (US Dollar).
GDP per capita^2 : Squared PDB per capita (US Dollar).
Pop   : Population (Soul).
Energy   : Electricity consumption (Tera Watt hour).
SDGs   : Dummy SDGs 17 Points (1= After SDGs, 0= Before SDGs).

Based on the equation (1), to prove or estimate the hypothesis of the EKC in ASEAN-6, based on the following terms and conditions:
1. If $\beta_2<0$, then the relationship in EKC is U-Inverted shaped.
2. If $\beta_2\geq0$, then the relationship in EKC is U-shaped.
3. Turning Point Calculation = $-\beta1/2\beta2$

EKC hypothesis can occur if GDP per capita has a positive coefficient and squared GDP per capita has a negative coefficient.

RESULT AND DISCUSSION

At 2009-2018, ASEAN 6 has different average trend value at carbon emissions, GDP per capita, squared GDP per capita, population and energy use. Average value of carbon emissions is 4.306333 metric tons per capita, with the largest expenditure from Singapore and the smallest from Philippines at 2009. Average value of GDP per capita is 13172.78 US Dollars and average squared GDP per capita is 5.39E+08 US Dollars, with the largest value is at 2018 in Singapore and the smallest in Vietnam at 2009. Averaged population is 91,245,738, with the highest at 2018 in Indonesia and the lowest is at Singapore at 2009. Average energy used was 126.0967 tera watt hour, with the highest value is in Indonesia at 2018 and the lowest in Singapore at 2009. This situation shows that ASEAN-6 has various condition (Table 1).

Table 1. Descriptive Research Variable

	CO2	GDP	GDP2	Population	Energy
Mean	4.306333	13172.78	5.39E+08	91245738	126.0967
Max.	11.8	66188.78	4.38E+09	2.68E+08	263.3
Min.	0.83	1217.269	1481743	4987573	40.5
Std. Dev.	3.291724	19276.68	1.18E+09	80413298	59.11174

Source : Data from research, 2020

Chow Test Result, obtained Prob. value of F cross-section 0.0000≤0.05, means the Fixed Effect is the right model to use. For Hausman Test, with a Prob. value. Random cross-section is 0.1250>0.05, means the right panel model is Random Effect. Lagrange Multiple test with Prob. value result. cross-section Breusch-Pagan is 0.0000<0.05, so Random Effect is the right model.

Estimated result of F-Statistic test obtained Prob. value 0.0000<0.05, means there is at least one of GDP per capita, squared GDP per capita, population, energy consumption and significant SDGs on carbon emissions. Adjusted R-Squared obtained 0.651277, means GDP per capita, squared GDP per capita, population, electricity consumption and SDGs can account for carbon emissions of 65.1277 percent, remaining 34.8723 percent is influenced by other variables, but

not included in the model. ASEAN 6 condition shows at table 2.

Table 2. Random Effect Model Regression Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.898343	0.8898	2.133448	0.0187
GDP per capita	0.000468	5.84E-05	8.012169	0.0000
Squared GDP per capita	-6.09E-09	6.96E-10	-8.75E+00	0.0000
POP	-1.29E-08	6.24E-09	-2.07E+00	0.0218
Energy	0.006544	0.003862	1.694639	0.0479
SDGs	-0.408541	0.213067	-1.917426	0.0302
Adjusted R-squared		0.651277		
F-statistic		23.03771		
Prob(F-statistic)		0.000000		

Source : Research processed data, 2020

Coefficient of GDP per capita is 0.000468 with Prob. t-stat of 0.0000<0.05, means GDP per capita has a positive and significant impact on carbon emissions. Coefficient of Squared GDP per capita is -6.09E-09 with Prob. t-stat of 0.0000<0.05, means that squared GDP per capita negatively and significantly affects carbon emissions. Coefficient of population is -1.29E-08 with a prob. value. t-stat of 0.0218<0.05, means that population negatively and significantly affects carbon emissions. Coefficient of energy consumption is 0.006544 with a prob. value. t-stat of 0.0479<0.05, means energy consumption has a positive and significant effect on carbon emissions. Coefficient of SDGs is -0.40854 with a Prob. value t-stat of 0.0302<0.05, means SDGs have a negative and significant effect on carbon emissions.

GDP per capita has a positive and significant impact on carbon emissions, according to research conducted by Darwanto, Woyanti, Santosa, Sasana, Ghozali (2019) [15]. This result is in line with EKC theory, because the increase in per capita income will increase carbon emissions up to turning point, when the structure of the industrial economy has

been completed. Because industrialization that is not environmentally friendly, this conditions can be occur and will accelerate increase in carbon emissions. ASEAN-6 minus Singapore, are countries that still uses not environmentally friendly technology, so increasing GDP per capita will increase carbon emissions. Indonesia and Malaysia are countries that doing deforestation for developing oil palm plantations. Deforestation, reduces one of forest functions as carbon emissions absorbent.

Squared GDP per capita has a negative and significant influence on carbon emissions, with the same result as Noor, & Saputra (2020) [18]. In accordance with EKC theory hypothesis, variable of GDP per capita significantly positive and squared GDP per capita has a negative value, so it will form an inverted U shaped.

Population has a negative and significant effect on carbon emissions, in line with Nikensari, Destilawati, S. & Nurjanah research (2019) and Trianto, & Purwanti (2018) [21, 22]. This situation does not mean that every increasing of population can reduce carbon emissions, because the development is not as fast as developed

countries, so, there is an increase in population populations that is higher than an increase in the proportion of carbon emissions. ASEAN 6 people actually want to used their resources for conservation rather than exploitation in pursuit of economic growth. This is reinforced by Indonesian culture, which remains applied to the custom so the community maintains the environmental sustainability around it.

Accordance to Saboori, Sulaiman & Mohd (2012), energy consumption has a positive and significant effect on carbon emissions. ASEAN-6 power plants still use fossil fuels such as coal and natural gas [23]. To meet the electricity needs with limited funds, government uses fossil-fueled power plants, thus increasing carbon emissions and accelerating environmental damage. ASEAN-6 needs to implement programs that reduce carbon emissions, and one of them is by utilizing environmentally friendly technology. SDGs negatively and significantly affect carbon emissions, accordance with Primary (2020) results.

Success of the SDGs program is very effective in reducing environmental damage, which result from follow-up agreement from 195 countries. Existence of the SDGs program increases country's awareness of the importance balance between economic, social and environmental. For this reason United Nations provides an assessment of the country's performance in implementing a sustainable development process every year. However, if sustainable development is further away from the target, United Nations will provide appeals and even warnings against the implemented policies. ASEAN-6 has established policies to protect the environment by reducing carbon emissions, through public transportation development programs, environmentally friendly technology, forest sustainability, and others. The Environmental Kuznets Curve (EKC) hypothesis explains the relationship between economic growth and environmental damage, due to carbon emissions that make up the inverted U-curve model [13]. The results of ekc research in ASEAN-6 in table 3.

Table 3. EKC Hypotesis Test Result at ASEAN-6

Sample	Coefficient value		Turning Point	EKC
	GDP	GDP2		
ASEAN-6	0.000468	-6.09E-09	38424 US Dollar	Happened

Source: Research processed data, 2020.

EKC hypothesis applies when coefficient value of GDP per capita has positive and coefficient value of GDP per capita squares is negative. Result of the estimation obtained the coefficient of GDP per capita of 0.000468 with GDP per capita squared at -6.09E-09, resulting in the enactment of the EKC hypothesis in ASEAN-6. It means, using ceteris paribus assumption, that any increase in GDP per capita by 1 US dollar will increase carbon emissions by 0.000468 metric tons per capita. In accordance with

EKC hypothesis, i.e. if the $\beta_2 < 0$ then EKC U-Inverted shaped. In this study produced a value of β_2 of -6.09E-09, thus EKC form in ASEAN-6 is U-Inverted shaped. However, ASEAN-6 minus Singapore has not yet reached EKC turning point. For the impact, industrialization has the potential to increase carbon emissions.

ASEAN 6 constant value of carbon emissions, obtained from the estimation that Malaysia is a country that has 3.240462 constant

value, followed by Indonesia of 2.491397, Singapore of 2.226707, Thailand of 1.355714, Vietnam of 1.314573 and the Philippines 0.761205. Malaysia and Indonesia have high carbon emissions because their countries develop industrialization and oil palm plantations, this conditions has not reached turning point of income. Singapore has the third high carbon emissions that are the result of turning points pre-achievement, but after service sector expand can increase GDP to reach turning points, thereby reducing carbon emissions. Thailand, Vietnam and the Philippines have low carbon emissions because the development is still based on agriculture and environmentally friendly agricultural support industry.

CONCLUSION

A random effect is a corresponding model in this study, with results of GDP per capita and electricity consumption having a positive and significant impact on carbon emissions in ASEAN-6. Squared GDP per capita, population and SDGs negatively and significantly affect carbon emissions in ASEAN-6. This research also proves that the EKC hypothesis occurs in ASEAN-6, but only Singapore has reached the turning point. ASEAN- 6 revenue minus Singapore has not reached the turning point, so there is still potential for increasing carbon emissions, ASEAN-6 needs to implement sustainable development policies, people are given awareness to achieve healthy, and quality living requires family planning, environmentally friendly energy development, coordination and seriousness in implementing SDGs.

REFERENCES

[1]   H. Mohajan, "The first industrial revolution: Creation of a new global human era," 2019.

[2]   M. Ziolo, B. Z. Filipiak, I. Bąk, K. Cheba, D. M. Tîrca, and I. Novo-Corti, "Finance, sustainability and negative externalities. An overview of the European context," *Sustainability,* vol. 11, no. 15, p. 4249, 2019.

[3]   C. A. Mgbemene, C. C. Nnaji, and C. Nwozor, "Industrialization and its backlash: focus on climate change and its consequences," *Journal of Environmental Science and Technology,* vol. 9, no. 4, pp. 301-316, 2016.

[4]   R. G. Williams, V. Roussenov, P. Goodwin, L. Resplandy, and L. Bopp, "Sensitivity of global warming to carbon emissions: Effects of heat and carbon uptake in a suite of Earth system models," *Journal of Climate,* vol. 30, no. 23, pp. 9343-9363, 2017.

[5]   J. M. Harris, B. Roach, and J. M. H. Environmental, *The economics of global climate change*. Global Development And Environment Institute Tufts University, 2007.

[6]   M. M. Baral, R. K. Singh, and Y. Kazançoğlu, "Analysis of factors impacting survivability of sustainable supply chain during COVID-19 pandemic: an empirical study in the context of

SMEs," *… of Logistics Management, //* 2021, doi: 10.1108/IJLM-04-2021-0198/full/www.Wto.Org/English/Tratop_E/Covid19_E.

[7]   S. Soekapdjo and A. M. Esther, "Determinasi Pertumbuhan Ekonomi Berkelanjutan di ASEAN-3," *Jurnal Ilmiah Ekonomi dan Bisnis,* vol. 16, no. 2, pp. 176-182, 2019.

[8]   B. Santosa, S. P. Salsabila, and S. Soeharjoto, "FAKTOR-FAKTOR YANG MEMPENGARUHI AGLOMERASI DI KABUPATEN BANDUNG BARAT," *Media Ekonomi,* vol. 27, no. 2, pp. 133-140, 2019.

[9]   S. Morton, D. Pencheon, and N. Squires, "Sustainable Development Goals (SDGs), and their implementationA national global framework for health, development and equity needs a systems approach at every level," *British medical bulletin,* pp. 1-10, 2017.

[10]   B. N. Bhattacharyay, "Prospects and challenges of integrating South and Southeast Asia," *International Journal of Development and Conflict,* vol. 4, pp. 40-66, 2014.

[11]   D. A. Tribudhi and S. Soekapdjo, "Determinasi transaksi dengan menggunakan uang elektronik di Indonesia," *KINERJA,* vol. 16, no. 1, pp. 78-84, 2019.

[12]   C. Cialani, "Economic growth and environmental quality: An econometric and a decomposition analysis," *Management of Environmental Quality: An International Journal,* 2007.

[13]   G. M. Grossman and A. B. Krueger, "Economic growth and the environment," *The quarterly journal of economics,* vol. 110, no. 2, pp. 353-377, 1995.

[14]   J. Andreoni and A. Levinson, "The simple analytics of the environmental Kuznets curve," *Journal of public economics,* vol. 80, no. 2, pp. 269-286, 2001.

[15]   D. Darwanto, "The damaging growth: An empiric evidence of Environmental Kuznets Curve in Indonesia," *670216917,* 2019.

[16]   S. Demissew Beyene and B. Kotosz, "Testing the environmental Kuznets curve hypothesis: an empirical study for East African countries," *International Journal of Environmental Studies,* vol. 77, no. 4, pp. 636-654, 2020.

[17]   M. Panait, M. Voica, and I. Rădulescu, "Approaches regarding environmental Kuznets curve in the European Union from the perspective of sustainable development," *Applied Ecology and Environmental Research,* vol. 17, no. 3, pp. 6801-6820, 2019.

[18]   M. A. Noor and P. M. A. Saputra, "Emisi Karbon dan Produk Domestik Bruto: Investigasi Hipotesis Environmental Kuznets Curve (EKC) pada Negara Berpendapatan Menengah di Kawasan ASEAN," *Jurnal Wilayah dan Lingkungan,* vol. 8, no. 3, pp. 230-246, 2020.

[19]   D. Yustisia, "Analisis empiris Environmental Kuznets Curve (EKC) terkait orientasi energi," *Jurnal Ekonomi & Studi Pembangunan,* vol. 15, no. 2, pp. 161-170, 2014.

[20]   B. Jugurnath and A. Emrith, "Impact of foreign direct investment on environment degradation: evidence from SIDS countries," *The Journal of Developing Areas,* vol. 52, no. 2, pp. 13-26, 2018.

[21]   S. I. Nikensari, S. Destilawati, and S. Nurjanah, "Studi Environmental Kuznets Curve di Asia: Sebelum dan Setelah Millennium Development Goals," *Jurnal Ekonomi dan Pembangunan,* vol. 27, no. 2, pp. 11-25, 2019.

[22]   M. F. S. Trianto and E. Y. Purwanti, "PERTUMBUHAN PENDUDUK, INFLASI DAN KORUPSI: ANALISIS EMPIRIS ENVIRONMENTAL KUZNETS CURVE (EKC) DI KAWASAN ASEAN PERIODE 2002-2016," Fakultas Ekonomika dan Bisnis, 2018.

[23]   B. Saboori, J. B. Sulaiman, and S. Mohd, "An empirical analysis of the environmental Kuznets curve for CO2 emissions in Indonesia: the role of energy consumption and foreign trade," *International Journal of Economics and Finance,* vol. 4, no. 2, pp. 243-251, 2012.

[24]   E. Tang, "Pengaruh Penanaman Modal Asing, Pendapatan Domestik Bruto, Konsumsi Energi, Konsumsi Listrik, dan Konsumsi Daging Terhadap Kualitas Lingkungan Pada 41 Negara di Dunia dan 17 Negara di Asia Periode 1999-2013," *CALYPTRA,* vol. 6, no. 2, pp. 1896–1914-1896–1914, 2018.

[25]   Y. P. Pratama, "Konsensus Kemitraan Global Pbb (MDGs & SDGs), Hipotesis Environmental Kuznet Curve (EKC), dan Degradasi Kualitas Udara di Indonesia Periode 1980-2018," *Diponegoro Journal of Economics,* vol. 9, no. 4, 2020.

[26]   P. W. Tjoek and P.-I. Wu, "Exploring the environmental Kuznets curve for CO2 and SO2 for Southeast Asia in the 21st century context," *Environmental economics,* no. 9, Iss. 1, pp. 7-21, 2018.

BIOGRAPHIES OF AUTHORS

Author 1	
	Soeharjoto. Hold Doctoral degree from Faculty of Economics and Business Universitas Trisakti (2021), Master of Science from Universitas Gadjah Mada (1997) and Bachelor of Economics from Universitas Trisakti (1994). From 1994 until now, as a Lecturer at Faculty of Economics and Business Universitas Trisakti. Right now, his position as a Chairman of Assembly, major in Economics at Universitas Trisakti and Secretary of Doctoral Programme, concentration at Islamic Economics and Finance at Universitas Trisakti. Also active as a researcher and as well as publish several books and journals at scientific journals.
Author 2	
	Nabila Inas Salma. Holds a Bachelor of Economics from Universitas Trisakti (2021). Currently a part-time lecture for Quantitative Analysis Tools in Universitas Trisakti and she was a teaching-assistant lecturer for several subjects such as microeconomics, macroeconomics and econometrics. She also working as a freelancer data statistic consultant. Her interests are in social-economics and environmental issue.
Author 3	
	Debbie Aryani Tribudhi. Hold Master of Management from Magister Management Universitas Trisakti (2000), also Bachelor of Economics from Universitas Trisakti (1997). From 2002 until now, works as a lecturer at Faculty of Economics and Business Universitas Trisakti. Now, she is based at Online Learning Departement Universitas Trisakti as a Head of Curriculum Development Online Learning Department.
Author 4	
	Lalu Masyhudi. Hold Master Statistic from Institut Teknologi Sepuluh Nopember Surabaya (2014). From 2015 until now, works as a lecturer at Sekolah Tinggi Pariwisata Mataram, he was a teaching Statistic and he also working as journal manager Media Bina Ilmiah