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The Impact of Socio-Economic and Climate Change on Poverty in Indonesia

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ABSTRACT

Climate change can impact farmers' incomes as agricultural production still depends on the weather. Currently, the majority of the impoverished rely primarily on agriculture for their income. The connection between poverty and climate change has been extensively studied, but further research is needed in this area. This research was conducted to provide empirical evidence regarding the impact of climate change on poverty using time series data, which has never been done. This research wants to examine the impact of socio-economics (economic growth, agricultural sector growth, inequality, inflation) and climate change on poverty. This research uses time series data from 2007 to 2022. The Central Bureau of Statistics and Climate Change Performance Index (CCPI) reports are the sources of research data. The study results suggest that the government's performance index in combating inflation, agricultural sector growth, and climate change has a positive impact on poverty. Poverty is negatively affected by the Gini index and economic growth. Government efforts to adaptively address climate change are necessary to prevent worsening impacts on poverty rates. To reduce the risk of crop failure, farmers must also practice practical agricultural management.

INTRODUCTION

One of the main goals of sustainable development (Sustainable Development Goals or SDGs) is to reduce poverty in all forms and everywhere. Poverty is still a major problem for developing countries. As a country that was still developing, poverty in Indonesia is still large. In 2022, the number of poor people in Indonesia will be 26.36 million (9.57%). This number has decreased compared to 2021, namely 26.50 million (9.71%). Most of the poverty in Indonesia is in rural areas, as much as 12.36%, while those living in urban are 7.53% (BPS 2023).

There are many factors related to poverty, but to recommend poverty alleviation measures, it is necessary to identify the predominant factors (Zebua et al. 2015). The definition of poverty is a condition in which society is still in a state of complete deprivation (World Bank 2005). Haughton & Khandker (2009) stated that there are key characteristics associated with poverty, namely regional, community, household, and individual characteristics. Regional characteristics include the geographical conditions of a region, such as susceptibility to floods or droughts, natural disasters, and the isolation of a region. Regional characteristics are also related to sustainable ecosystems and increasing the well-being of local communities (Shi et al. 2023). Community characteristics include the availability of infrastructure (roads, clean water, electricity), health and educational services, distance to markets, and social relationships. Social relationships in the form of community interactions can help households escape poverty if used appropriately (Onumah et al. 2023). Household and individual characteristics can now be identified from a demographic perspective (number of household members, age structure, dependency ratio). Human capital (migrant workers, labor, and education) has a positive moderating effect on the impact of poverty reduction, and education provides the most significant moderating effect (Cheng et al. 2021). The characteristics of poverty are considered from an economic perspective (employment status, number of hours worked, number of possessions). The economic aspect in the form of the financial sector can contribute to poverty reduction by providing capital to households (Erlando et al. 2020). The characteristics of poverty are considered from social aspects (health status, level of education, place of residence). The health status of the community depends heavily on the existing health facilities. Health facilities can reduce poverty by offering their patients cheap treatment costs (Qin et al. 2021), including health insurance (Alatinga & Williams 2019).

According to Isiwu et al. (2021), poverty is a multidimensional problem related to social, political, and

economic problems, asset ownership, and access to needed resources. The inability to obtain necessary access results in poor people being excluded from decision-making processes aimed at alleviating poverty, including access to economic growth through development aimed at reducing poverty. Poor people cannot enjoy economic growth due to limited access (Ebunoluwa & Yusuf 2018). Limitations on access to needed resources are exacerbated by limited access to information. In the long term, mastering access to information reduces households' vulnerability to poverty (Huang et al. 2023).

In addition to the problem of poverty, dealing with climate change is also a goal to be achieved in the SDGs. The connection between climate change and poverty is increasingly discussed, as poor people feel the effects most acutely (Schleicher et al. 2018). This is because poor people rely heavily on natural resources as their main source of livelihood (Miller et al. 2022).

In Africa, government performance in addressing climate change is measured using the African Climate Change Policy Performance Index (ACCPPI). The assessment is based on four main assessments, namely the greenhouse gas emissions assessment (30%), the renewable energy assessment (25%), the government climate policy assessment (25%), and the corruption perception assessment (20%) (Epule et al. 2021). Another measure to assess the government's performance in dealing with climate change is the Climate Change Performance Index (CCPI). The CCPI assessment is based on four categories, namely greenhouse gas emissions (40%), renewable energy (20%), energy consumption 20% and government policies dealing with climate change (20%) (Burnch et al. 2021).

Research on the impact of climate change on poverty was conducted (Azzarri & Signorelli 2020) using data from a household survey in South Africa. The research shows that small farmers are the group most affected by weather fluctuations due to both floods and droughts, compared to large farmers and non-agricultural households. This is because smallholder farmers have many limitations in accessing various resources that can be used to adapt to climate change. Society must adapt to avoid major losses. Adaptation to climate change can be carried out by society individually or through institutions (Gross et al. 2016). Individually, communities are adapting to climate change by adapting their activities. At the institutional level, adaptations are required in the use of natural resources and ecosystems to deal with climate change.

Climate change has an impact on macroeconomic stability. Management measures to combat climate change offer significant benefits for economic growth, although they entail both direct and indirect costs. However, the costs incurred will increase if climate change is not addressed. Climate change influences economic growth, although this influence occurs through other variables such as savings and community capital accumulation (Fankhauser & Tol 2005, Kadanali & Yalcinkaya 2020). Economic growth also affects poverty and income distribution. Alrakhman et al. (2022) analyzed inequality, economic growth, and unemployment on the island of Sumatra. The analysis results show that inequality and economic growth have a negative relationship.

It is hoped that the results of development, as measured by economic growth, can benefit all people, including those living in poverty. If development benefits the poor, economic growth should reduce inequality (Tan 2020). However, many factors influence inequality, both economic and social, including gaps in economic potential and activity, quality of human resources, investments, labor, and government spending (Walujadi et al. 2022). Economic growth, poverty, and inequality are targets in SDGs No. 1 and 10. Lin et al. (2022) conducted growth-poverty inequality modeling in the Nile Valley using data from 2000 to 2020. Research shows that economic growth reduces poverty, while high levels of inequality can worsen poverty. Therefore, high inequality can hinder economic growth and poverty reduction efforts. The results of this research strengthen previous research by (Adeleye et al. 2020). Likewise, research by (Capuno 2022) concluded that economic growth alone is not enough to reduce poverty.

Inflation affects people living in poverty. When the inflation rate is high, it means that prices are rising, which ultimately puts a strain on people's spending, especially those living in poverty. The increase in food prices in Turkey during 2016–2019 increased poverty (Kiroğlu & Sezgin 2021). The research conducted by (Susanto 2014) also came to the same conclusion. Rehman et al. (2022) found that inflation and poverty have a negative impact on economic growth. Meanwhile, Fitriady et al. (2022) found that inflation has no impact on poverty and economic growth. In addition, it is recommended that the government not only focus on economic growth but also strive to reduce regional disparities and invest in human resource development.

Human resource development plays an essential role in poverty alleviation. High-quality human resources are the capital for sustainable development. It can create a creative economy (Rosyadi et al. 2019). With sustainable economic development, human resources influence the effectiveness of poverty reduction efforts (Amaluddin et al. 2018). Therefore, personnel development is a measure of the success of the development. In addition, high-quality human resources can adapt more quickly to climate change, thereby reducing vulnerability to poverty (Zhou et al. 2022).

To this day, the agricultural sector plays an essential role in fighting poverty. Agricultural growth led by small farmers is more effective in reducing poverty than large farmers (Dorosh & Thurlow 2018). Meanwhile, non-agricultural growth in trade, transport services, and manufacturing, especially in the agricultural processing industry, is almost approaching the role of the agricultural sector. In Indonesia, agriculture is the leading sector in several regions, and most rural communities rely on the agricultural sector for their livelihoods. Based on 2014-2017 data from 33 provinces, it is known that the growth of the agricultural sector contributed to the economy and reduced the level of rural poverty in Indonesia (Arham et al. 2020). Meanwhile, the slowdown in agricultural growth in the 2000s could undermine poverty reduction and food security efforts in Mozambique (Pauw et al. 2012). Higher agricultural productivity may be associated with the availability of cheaper food for consumption by households and for use as input in the industrial sector. Increasing agricultural productivity results in an improvement in consumer welfare, which implies that it contributes to the reduction of poverty through the relationship between prices and input supply.

The problem of poverty concerns various dimensions that are interconnected. This means that progress or deterioration in one aspect can have an impact on other aspects (Prawoto & Basuki 2022). Another aspect related to poverty is the resources available in an area. Excessive use of resources in an area to accelerate poverty reduction can result in environmental damage that worsens or hinders poverty reduction programs. Based on this explanation, this research aims to examine the impact of socio-economic and climate change on poverty.

MATERIALS AND METHODS

Study Area

This research was conducted in Indonesia using secondary data on climate change and poverty. As a tropical country still dependent on agriculture, Indonesia is severely affected by climate change.

Data Collection

This research uses secondary data collected through recording. Research data was obtained by institutions related to research, the Central Statistic Agency (BPS) and the Intergovernmental Panel on Climate Change (IPCC).

Data Analysis

This research uses time series data from 2007 to 2022. The data that has been collected will be tested with the Jarque-Bera test (JB test) to see whether the data used is normal. To determine the possibility of autocorrelation and multicollinearity, the data will be tested with the Breusch-Godfrey Serial Correlation LM test and Variance Inflation Factors (VIF). Meanwhile, to determine the presence of heteroscedasticity, the data will be tested using the Breusch-Pagan-Godfrey test. The research data was analyzed using a multiple linear regression model with natural logarithms. The relationship between economic growth, inequality, inflation, and HDI was studied by Lin et al. (2022), Walujadi et al. (2022), Tan (2020) and Alrakhman et al. (2022) using a multiple linear regression model. This research uses the same model as previous studies, but the researchers added a climate change variable in the form of a climate change index, which was not available in previous research. The equation model in this research is as follows:

$$\text{LnP0} = \alpha + \beta_1\text{LnGRO} + \beta_2\text{LnAGR} + \beta_3\text{LnINF} + \beta_4\text{LnGI} + \beta_5\text{LnHDI} + \beta_6\text{LnCCPI} + \varepsilon \quad \ldots(1)$$

where α is a constant, P0 is the percentage of poor people, GRO = economic growth expressed in percentage units, AGR = is the growth of the agricultural sector expressed in percentage units, INF = inflation, GI = Gini index, HDI = human development index, CCPI = Climate Change Performance Index, and ε is an error.

RESULTS AND DISCUSSION

Data Analysis Results

The number of poverty in Indonesia is still large, although it has decreased in recent years. The following Table 1 shows the number of poverty in Indonesia.

Poverty in Indonesia is experiencing a decreasing trend even though the number is still relatively large. Most of the poverty in Indonesia is in rural areas and relies on the agricultural sector as its main source of income. Until now, the agricultural sector is still dependent on climate conditions. The impact of climate change directly impacts agricultural sector production. The data obtained was analyzed using the EViews 12 application program. Table 2 shows the results of the data analysis carried out.

The results of the data analysis show that the adjusted R-squared value is 0.817691, which means that the independent variable of 81.76 percent can explain the dependent variable in the form of poverty. Data analyzed using multiple linear regression typically must have distributed residuals. To find out whether the residual normality of the data is normally distributed or not, the Jarque-Bera test (JB test) is performed. The analysis results show that the JB test value is 3.640249 (probably

Table 1: Poverty in Indonesia.

Year	Rural (%)	Urban (%)	Total (%)
2012	14.70	8.60	11.66
2013	14.42	8.52	11.47
2014	13.76	8.16	10.96
2015	14.09	8.22	11.13
2016	13.96	7.73	10.70
2017	13.47	7.26	10.12
2018	13.10	6.89	9.66
2019	12.60	6.56	9.22
2020	13.20	7.88	10.19
2021	12.53	7.60	9.71
2022	12.36	7.53	9.57

Source: BPS (2023)

Table 2: Data Analysis Results.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-6.604462	5.266950	-1.253944	0.2415
GRO	-0.025672	0.015257	-1.682686	0.1267
AGR	0.287896	0.073636	3.909708	0.0036
INF	0.102192	0.044928	2.274564	0.0490
GI	-3.389319	0.614185	-5.518400	0.0004
HDI	0.040900	1.076104	0.038007	0.9705
CCPI	1.299334	0.315867	4.113547	0.0026
R-squared	0.890615	Mean dependent var		2.439531
Adjusted R-squared	0.817691	S.D. dependent var		0.177745
S.E. of regression	0.075893	Akaike info criterion		-2.019355
Sum squared resid	0.051837	Schwarz criterion		-1.681347
Log-likelihood	23.15484	Hannan-Quinn criterion		-2.002046
F-statistic	12.21299	Durbin-Watson stat		2.110465
Prob(F-statistic)	0.000702			

Source: primary data analysis, 2023.

0.162006), which means that the residual data is normally distributed because the p-value is > 0.05. To test whether there is autocorrelation in the data used, the Breusch-Godfrey Serial Correlation LM test was performed. The test results show that the Breusch-Godfrey Serial Correlation LM test value is 0.5016 (probably Chi-square (2) 0.2390 > 0.05), which means there is no serial correlation problem. The multicollinearity in this research model is detected using the Variance Inflation Factors (VIF) value. The general values to indicate the limits of multicollinearity are VIF > 10 and tolerance values < 0.10 (Hamid & Anwar 2019). Based on the results of multicollinearity analysis, it is known that the centered VIF value for all variables is <10, so it can be determined that there is no multicollinearity problem in the model used. Next, the Breusch-Pagan-Godfrey test is used to determine heteroscedasticity. The results of the Breusch-Pagan-Godfrey test show that the probability value of Chi-square (6) in Obs*R-square is 0.8130 > 0.05, which means that there is no problem with the assumption of non-heteroskedasticity. Based on the results of the F test analysis (overall test), it is known that the F-statistic value = 12.21299 (prob. = 0.000702). This shows that, overall, the independent variables in this study have a natural influence on poverty.

Economic Growth

The economic growth analysis results show that the t-statistic value is -1.682686 (prob.=0.1267). This shows that economic growth does not have a significant direct effect on poverty reduction. The role of economic growth in poverty reduction has long been debated (Balasubramanian et al. 2023). This debate becomes important after the SDGs establish that reducing poverty in all its forms is the main goal, as well as promoting sustainable economic growth and providing decent work opportunities for all. Research by Seth & Alkire (2021) found a weak negative correlation between economic growth and the poverty index. Focusing on previous cross-country research (Alkire et al. 2017), there is no significant relationship between economic growth and changes in poverty in 27 sub-Saharan African countries. Meanwhile, studies by (Burchi et al. 2019) found a weak negative correlation between economic growth and poverty reduction in 51 low- and middle-income countries. In our research, we found that economic growth does not have a significant impact on changes in poverty. However, economic growth can reduce poverty through intermediate variables (Putro et al. 2017). Therefore, for economic growth to have a tangible impact on poverty reduction, economic development must be directed towards pro-poor activities, such as the provision of facilities and infrastructure needed by people experiencing poverty. Likewise, government spending is more focused on labor-intensive projects to reduce unemployment (Ebunoluwa & Yusuf 2018).

Growth of the Agriculture Sector

The results of the analysis of the growth of the agriculture sector show that the agriculture sector has an impact on poverty. However, increasing growth in the agriculture sector has a positive impact on increasing poverty. Several research findings show that economic growth has a positive impact on poverty reduction (Ivanic & Martin 2018), although it is clear in which sector economic growth occurs. Poverty

is known to occur primarily in rural areas and is, therefore, very dependent on the agriculture sector. This is important, considering that the agriculture sector is a key factor in economic transformation and poverty reduction (Dorinet et al. 2021). However, as development progresses, there will be changes in the economic structure, reducing the role of agriculture and decreasing its productivity, making it less effective in poverty alleviation. The results of Fan & Cho (2021) say that smallholder agriculture growth in land-scarce countries has a significant impact on poverty alleviation. Furthermore, once agricultural productivity reaches a certain point, the availability of non-agricultural fields and migration from villages to cities will follow. In this phase, the role of the agriculture sector is significantly reduced. Likewise, the research by Urfels et al. (2023) found that the agriculture sector plays a minimal role in poverty reduction. Eichsteller et al. (2022) and Maqbool (2023) also noted that the role of the agriculture sector in poverty reduction in Kenya needs to be clarified as poor farmers find it very difficult to switch to more profitable agriculture strategies and climate change shocks exacerbate this condition. In this research, we found that the agriculture sector no longer plays a role in poverty reduction in Indonesia. This is because the agriculture sector in Indonesia is not the largest contributor to national income. The role of the agriculture sector in national income is third after the commercial and industrial sectors.

Inflation

Inflation, poverty, and unemployment are the main problems for developing countries (Rehman et al. 2022). The problem of inflation, which increases prices, especially of food, affects household spending. The results of our analysis show that t-statistic = 2.274564 (prob.= 0.0490), which means that inflation has a significant impact on poverty. Inflation has a significant and positive impact on poverty, meaning that a 1% increase in inflation will cause an increase in poverty of 0.102%. The higher the inflation, the more poverty there will be. This happens because inflation causes people's purchasing power to decrease. The results of our research are supported by Ningsih & Andiny (2018) and (Mardiatillah et al. 2021), who concluded that inflation has a real impact on poverty. Meanwhile, research by Kıroğlu & Sezgin (2021) reports that food inflation may increase poverty in Turkey.

Inequality

Poverty is closely linked to inequality. One measure of inequality is the Gini index. The results of the analysis show that t-statistic = -5.518400 (prob.= 0.0004), which means that inequality affects poverty. This means that poverty alleviation development has yet to be implemented in the poorest communities. Many poor people cannot yet enjoy the results of the development carried out. These results are in line with the findings of (Etuk & Ayuk 2021) on agricultural commercialization projects in Nigeria, which concluded that although poverty alleviation projects have a positive impact on poverty reduction, those who are not poor have many benefits. It is necessary to pay attention to the poor people who are being targeted. Likewise, (Capuno 2022) said that poverty alleviation requires efforts to reduce inequality through redistribution of growth. Poverty alleviation strategies based on high growth apply only to high-income countries (Fosu 2017, Pasha 2022), while in low-income countries, poverty alleviation efforts should prioritize income distribution.

Human Development Index

The Human Development Index measures the success of human quality development. The higher the human development index, the higher the qualifications of people. The human development index measurement is based on age, knowledge, and an adequate standard of living. The results of the analysis carried out show that the Human Development Index has no significant impact on poverty. Likewise, the research by (Nurlita et al. 2017) shows that the Human Development Index has neither a direct nor indirect impact on poverty reduction. The analysis results are also consistent with the results of (Alhudori 2017), which shows a positive relationship between the human development index and poverty. Increasing the Human Development Index does not guarantee that someone will survive poverty. Government support in the form of subsidies for education and health will increase the human development index. However, this does not automatically mean that the person concerned will escape poverty. Improved education and health, but not matched by higher skills and broader employment opportunities, will make it difficult for low-income families to leave the work they do (Kulyakwave et al. 2023). Increasing the number of workers with higher education while employment opportunities are limited will increase existing poverty. Therefore, it is important to improve the quality of education, not just the length of the training period, but must be accompanied by an increase in existing skills (Tubaka 2019). Increasing skills must also be accompanied by access to other resources so that poor people can use them. Increasing education for community groups will also improve their social status. Poor people with increasing social status will try to look for better jobs and leave their old jobs. However, the limited employment opportunities lead to a decrease in household income and, thus, an increase in the number of poor people.

Climate Change

The results of the regression analysis show that the government's performance in dealing with climate change issues has a positive impact on poverty at a significant level of 0.05. The more attention the government devotes to addressing climate change, the more poverty will increase. The government's performance on climate change is related to the government's policies and spending. Government policy in dealing with climate change presents the government with a dilemma. The combination of government actions to address climate change and efforts to eradicate poverty places an increased financial burden on the government. Increasing spending on efforts to address climate change will cause spending on poverty alleviation efforts to decrease (Soergel et al. 2021). The result is increasing poverty (Bertram et al. 2018). Also found that there is a trade-off between the policies and costs of addressing climate change. Good climate protection measures require high costs, which increasingly burden people with low incomes.

To maximize government performance in addressing climate change, this can be done through the private sector. This is because several activities that the government cannot carry out can be carried out by the private sector in terms of dealing with climate change (Cao & Zheng 2016). Public awareness is needed to create a healthy living environment in addition to healthy living and consumption patterns. Awareness of healthy lifestyles needs to be raised in the community to facilitate government action to address environmental problems. For this reason, separate management is required to address poverty-related climate change. Of course, when dealing with climate change, changes in precipitation patterns, temperature, and existing humidity must also be considered. These changes affect agricultural production, health, and social problems in society.

Based on the results of the analysis and discussion, good adaptive management is required to deal with climate change. This is necessary so that government policy in dealing with climate change is consistent with poverty reduction policy (Abera & Tesema 2019). Information about the climate change taking place needs to be shared with the community so they can adapt. In the agricultural sector, adaptation to climate change occurs by adjusting planting plans. The information conveyed about climate change is, of course, locally specific (Chari & Ngcamu 2022). In addition, information about climate change is also needed so that society can regulate its activities. This is related to the emergence of several diseases in society due to climate change (Buizza et al. 2022). If the public can well understand information about climate change, they can adapt to the activities carried out.

CONCLUSION

This research wants to examine the impact of socio-economics (economic growth, agricultural sector growth, inequality, inflation, human development index) and climate change on poverty. Based on the results of the analysis conducted, the government's performance in dealing with climate change has a positive impact on poverty. Agricultural sector growth and inflation also have a positive impact on poverty, while inequality has a negative impact on poverty. Other factors, namely economic growth and the human development index, have no significant impact on poverty.

To reduce the impact of socio-economic and climate change on poverty, the government can adopt policies by seeking economic growth that does not have a negative impact on the environment. Further research is needed to examine environmentally friendly economic growth.

REFERENCES

Abera, N. and Tesema, D., 2019. Perceptions and practices of climate change adaptation and mitigation strategies among farmers in the Konta Special District, Ethiopia. *Environmental and Socio-Economic Studies*, 7(4), pp.1–16. https://doi.org/10.2478/environ-2019-0019

Adeleye, B.N., Gershon, O., Ogundipe, A., Owolabi, O., Ogunrinola, I. and Adediran, O., 2020. Comparative investigation of the growth-poverty-inequality trilemma in Sub-Saharan Africa and Latin American and Caribbean Countries. *Heliyon*, 6(12). https://doi.org/10.1016/j.heliyon.2020.e05631

Alatinga, K.A. and Williams, J.J., 2019. Mixed Methods Research for Health Policy Development in Africa: The Case of Identifying Very Poor Households for Health Insurance Premium Exemptions in Ghana. *Journal of Mixed Methods Research*, 13(1), pp.69–84. https://doi.org/10.1177/1558689816665056

Alhudori, M., 2017. The Influence of HDI, GRDP, and The Amount of Unemployment on The Poor Population in Jambi Province. *Ekonomis: Jurnal of Economics and Business*, 1(1), pp.113–124.

Alkire, S., Jindra, C., Robles Aguilar, G. and Vaz, A., 2017. Multidimensional Poverty Reduction Among Countries in Sub-Saharan Africa. *Forum for Social Economics*, 46(2), pp.178–191. https://doi.org/10.1080/07360932.2017.1310123

Alrakhman, D., Susetyo, D., Taufiq, and Azwardi, 2022. An Analysis On Inequality, Economic Growth, And Unemployment In Sumatera Island. *Quality - Access to Success*, 23(190), pp.302–314. https://doi.org/10.47750/QAS/23.190.32

Amaluddin, A., Payapo, R.W., Laitupa, A.A. and Serang, M.R., 2018. A Modified Human Development Index and Poverty in the Villages of West Seram Regency, Maluku Province, Indonesia. *International Journal of Economics and Financial Issues*, 8(2), pp.325–330. Available at: http://www.econjournals.com

Arham, M.A., Fadhli, A. and Dai, S.I., 2020. Does Agricultural Performance Contribute to Rural Poverty Reduction in Indonesia? *JEJAK*, 13(1), pp.69–83. https://doi.org/10.15294/jejak.v13i1.20178

Nurlita, A.C., Haris Musa, A. and Budi Suharto, R., 2017. The Influence of Human Development Index (HDI) and Economic Growth on Unemployment and Poverty in Samarinda. *Jurnal Ilmu Ekonomi Mulawarman (JIEM)*, 2(1), p.16.

Azzarri, C. and Signorelli, S., 2020. Climate and poverty in Africa South of the Sahara. *World Development*, 125, p.691. https://doi.org/10.1016/j.worlddev.2019.104691

Balasubramanian, P., Burchi, F. and Malerba, D., 2023. Does economic growth reduce multidimensional poverty? Evidence from low- and middle-income countries. *World Development*, 161, p.106119. https://doi.org/10.1016/j.worlddev.2022.106119

Bertram, C., Luderer, G., Popp, A., Minx, J.C., Lamb, W.F., Stevanović, M., Humpenöder, F., Giannousakis, A. and Kriegler, E., 2018. Targeted policies can compensate for most of the increased sustainability risks in 1.5 °C mitigation scenarios. *Environmental Research Letters*, 13(6), p.1088. https://doi.org/10.1088/1748-9326/aac3ec

BPS, 2023. *Profile of Poverty in Indonesia*. BPS

Buizza, R., Carratore, R. Del, and Bongioanni, P., 2022. Evidence of climate change impact on Parkinson's disease. *Journal of Climate Change and Health*, 6. https://doi.org/10.1016/j.joclim.2022.100130

Burchi, F., Malerba, D., Rippin, N. and Montenegro, C.E., 2019. Comparing Global Trends in Multidimensional and Income Poverty and Assessing Horizontal Inequalities. *Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH*. https://doi.org/10.23661/dp2.2019

Burnch, J., Uhlich, T., Bals, C., Höhne, N. and Nascimento, L., 2021. Climate Change Performance Index: Background and Methodology.

Cao, S. and Zheng, H., 2016. Climate change adaptation to escape the poverty trap: role of the private sector. *Ecosystem Health and Sustainability*, 2(10). https://doi.org/10.1002/ehs2.1244

Capuno, J.J., 2022. Growth with redistribution, finally: Regional poverty and inequality in the Philippines, 2000–2018. *Asia and the Global Economy*, 2(2), 100039. https://doi.org/10.1016/j.aglobe.2022.100039

Chari, F. and Ngcamu, B.S., 2022. Climate change and its impact on urban agriculture in Sub-Saharan Africa: A literature review. *Environmental and Socio-Economic Studies*, 10(3), pp.22–32. https://doi.org/10.2478/environ-2022-0014

Cheng, X., Chen, J., Jiang, S., Dai, Y., Shuai, C., Li, W., Liu, Y., Wang, C., Zhou, M., Zou, L., Zhang, P. and Kang, X., 2021. The impact of rural land consolidation on household poverty alleviation: The moderating effects of human capital endowment. *Land Use Policy*, 109. https://doi.org/10.1016/j.landusepol.2021.105692

Dorinet, E., Jouvet, P.A. and Wolfersberger, J., 2021. Is the agricultural sector cursed too? Evidence from Sub-Saharan Africa. *World Development*, 140. https://doi.org/10.1016/j.worlddev.2020.105250

Dorosh, P. and Thurlow, J., 2018. Beyond Agriculture Versus Non-Agriculture: Decomposing Sectoral Growth–Poverty Linkages in Five African Countries.

Ebunoluwa, O.O. and Yusuf, W.A., 2018. Effects of Economic Growth on Poverty Reduction In Nigeria. *IOSR Journal of Economics and Finance*, 9(5), pp.25–29. https://doi.org/10.9790/5933-0905012529

Eichsteller, M., Njagi, T. and Nyukuri, E., 2022. The role of agriculture in poverty escapes in Kenya – Developing a capabilities approach in the context of climate change. *World Development*, 149, p. 5705. https://doi.org/10.1016/j.worlddev.2021.105705

Epule, T.E., Chehbouni, A., Dhiba, D., Moto, M.W. and Peng, C., 2021. African climate change policy performance index. *Environmental and Sustainability Indicators*, 12, p. 163. https://doi.org/10.1016/j.indic.2021.100163

Erlando, A., Riyanto, F.D. and Masakazu, S., 2020. Financial inclusion, economic growth, and poverty alleviation: evidence from eastern Indonesia. *Heliyon*, 6(10). https://doi.org/10.1016/j.heliyon.2020.e05235

Etuk, E.A. and Ayuk, J.O., 2021. Agricultural commercialisation, poverty reduction and pro-poor growth: evidence from commercial agricultural development project in Nigeria. *Heliyon*, 7(5). https://doi.org/10.1016/j.heliyon.2021.e06818

Fan, S. and Cho, E.E.Y., 2021. Paths out of poverty: International experience. *Journal of Integrative Agriculture*, 20(4), pp.857–867. https://doi.org/10.1016/S2095-3119(20)63295-6

Fankhauser, S. and Tol, R.S.J., 2005. On climate change and economic growth. *Resource and Energy Economics*, 27(1), pp.1–17. https://doi.org/10.1016/j.reseneeco.2004.03.003

Fitriady, A., Silvia, V. and Suriani, S., 2022. Does Economic Growth Mediate Investment, Inflation, and Human Development Investment on Poverty in Indonesia? *Signifikan: Jurnal Ilmu Ekonomi*, 11(2), pp.437–456. https://doi.org/10.15408/sjie.v11i2.26145

Fosu, A.K., 2017. Growth, inequality, and poverty reduction in developing countries: Recent global evidence. *Research in Economics*, 71(2), pp.306–336. https://doi.org/10.1016/j.rie.2016.05.005

Gross, J., Woodley, S., Welling, L.A. and Watson, J.E.M., 2016. Adapting to climate change: Guidance for protected area managers and planners. *World Development*, 109, pp.440–451. https://doi.org/10.1016/j.worlddev.2016.08.014

Hamid, R.S. and Anwar, S.M., 2019. *Variant-Based Structural Equation Modeling (SEM): Basic Concepts and Application with SmartPLS 3.2.8 Program in Business Research*. PT Inkubator Penulis Indonesia.

Haughton, J. and Khandker, S.R., 2009. *Handbook on Poverty and Inequality*. Springer

Huang, W., Ding, S., Song, X., Gao, S. and Liu, Y., 2023. A study on the long-term effects and mechanisms of internet information behavior on poverty alleviation among smallholder farmers: Evidence from China. *Heliyon*, 9(9). https://doi.org/10.1016/j.heliyon.2023.e19174

Isiwu, G.D., Azike, L.C. and Ngwu, J.C., 2021. Poverty and economic growth nexus in Nigeria. *Journal of Social Science*, 6(2), pp.136–153.

Ivanic, M. and Martin, W., 2018. Sectoral Productivity Growth and Poverty Reduction: National and Global Impacts. *World Development*, 109, pp.429–439. https://doi.org/10.1016/j.worlddev.2017.07.004

Kadanali, E. and Yalcinkaya, O., 2020. Effects of climate change on economic growth: Evidence from 20 biggest economies of the world. *Romanian Journal of Economic Forecasting*, 23(3), pp.93–118.

Kıroğlu, B.S. and Sezgin, Ş., 2021. The Impact of Food Inflation on Poverty in Turkey. *Journal of Economics, Business and Political Studies*, 8(2), pp.256–273. https://doi.org/10.48064/equinox.995580

Kulyakwave, P.D., Shiwei, X. and Wen, Y., 2023. Climate and Socio-economic Factors Affecting the Adoption of Irrigation Practices for Improved Rice Yield in Mbeya Region, Tanzania. *Journal of Environmental Science and Management*, 26(1), pp.1–11.

Lin, Y., Zhang, T., Liu, X., Yu, J., Li, J. and Gao, K., 2022. Dynamic monitoring and modeling of the growth-poverty-inequality trilemma in the Nile River Basin with consistent night-time data (2000–2020). *International Journal of Applied Earth Observation and Geoinformation*, 112. https://doi.org/10.1016/j.jag.2022.102903

Maqbool, N., 2023. Impact of Climate Change on Water in Pakistan. *The Pakistan Development Review*, 62(4), pp.605–616.

Mardiatillah, R., Panorama, M. and Maftukhatusolikhah, M., 2021. The Effect of Unemployment and Inflation on Poverty in South Sumatra 2015-2019. *Jurnal Intelektualita: Keislaman, Sosial Dan Sains*, 10(2), pp.365–370. https://doi.org/10.19109/intelektualita.v10i2.8825

Miller, D.C., Cheek, J.Z., Mansourian, S. and Wildburger, C., 2022. Forest, trees and the eradication of poverty. *Forest Policy and Economics*, 140, p.1541.

Ningsih, D. and Andiny, P., 2018. Analysis of the effect of inflation and economic growth on poverty in Indonesia. *Jurnal Samudra Ekonomika*, 2(1), pp.53-61.

Onumah, J.A., Osei, R.D., Martey, E. and Asante, F.A., 2023. Welfare dynamics of innovations among agricultural households in Ghana: Implication for poverty reduction. *Heliyon*, 9(7). https://doi.org/10.1016/j.heliyon.2023.e18066.

Pasha, H.A., 2022. A new measure of inequality in Asian economies. *The Pakistan Development Review*, 61(4), pp.659-662.

Pauw, K., Thurlow, J., Uaiene, R. and Mazunda, J., 2012. Agricultural growth and poverty in Mozambique: Technical analysis in support of the comprehensive Africa agriculture development program (CAADP).

Prawoto, N. and Basuki, A.T., 2022. Factors affecting poverty in Indonesia: A panel data approach. *Quality - Access to Success*, 23(186), pp.156-161. https://doi.org/10.47750/QAS/23.186.20.

Putro, P.B.W., Mintarti, S. and Wijaya, A., 2017. Analysis of determination of economic growth and poverty. *Inovasi*, 13(2), pp.121-126.

Qin, L., Chen, C., Li, Y., Sun, Y. and Chen, H., 2021. The impact of the new rural cooperative medical scheme on the "health poverty alleviation" of rural households in China. *Journal of Integrative Agriculture*, 20(4), pp.1068-1079. https://doi.org/10.1016/S2095-3119(20)63372-X.

Rehman, A., Cismas, L.M. and Milin, I.A., 2022. "The three evils": Inflation, poverty and unemployment's shadow on economic progress—A novel exploration from the asymmetric technique. *Sustainability (Switzerland)*, 14(14), p.642. https://doi.org/10.3390/su14148642.

Rosyadi, S., Haryanto, A., Kusuma, A.S. and Fitrah, E., 2019. The role of creative economy in promoting sustainable rural development. *Advances in Social Science, Education and Humanities Research*, 389, pp.111-115.

Schleicher, J., Schaafsma, M. and Vira, B., 2018. Will the sustainable development goals address the links between poverty and the natural environment? *Current Opinion in Environmental Sustainability*, 34, pp.43-47. https://doi.org/10.1016/j.cosust.2018.09.004.

Seth, S. and Alkire, S., 2021. Multidimensional poverty and inclusive growth in India: An analysis using growth elasticities and semi-elasticities. *Working Papers 137*, Oxford Poverty and Human Development Initiative (OPHI), University of Oxford.

Shi, C., He, Y. and Li, H., 2023. How does ecological poverty alleviation contribute to improving residents' sustainable livelihoods? — Evidence from Zhejiang Province, China. *Sustainable Production and Consumption*, 41, pp.418-430. https://doi.org/10.1016/j.spc.2023.09.002.

Soergel, B., Kriegler, E., Bodirsky, B.L., Bauer, N., Leimbach, M. and Popp, A., 2021. Combining ambitious climate policies with efforts to eradicate poverty. *Nature Communications*, 12(1), p.315. https://doi.org/10.1038/s41467-021-22315-9.

Susanto, J., 2014. Impact of economic growth, inflation and minimum wage on poverty in Java. *Media Ekonomi & Teknologi Informasi*, 41, pp.418-430.

Tan, R.P., 2020. Social capital and vulnerability to extreme climate in a semi-urban fishing community in Laguna de Bay, Philippines. *Journal of Environmental Science and Management*, 23(2), pp.89-101.

Tubaka, S., 2019. Analysis of poverty in eastern Indonesia. *Cita Ekonomika*, 13(1), pp.113-130. http://winardi-andalas-putro-blogspot.com.

Urfels, A., Mausch, K., Harris, D., McDonald, A.J., Kishore, A., Balwinder-Singh, van Halsema, G., Struik, P.C., Craufurd, P., Foster, T., Singh, V. and Krupnik, T.J., 2023. Farm size limits agriculture's poverty reduction potential in eastern India, even with irrigation-led intensification. *Agricultural Systems*, 207, p.618. https://doi.org/10.1016/j.agsy.2023.103618.

Walujadi, D., Indupurnahayu, I. and Endri, E., 2022. Determinants of income inequality among provinces: Panel data evidence from Indonesia. *Quality - Access to Success*, 23(190), pp.243-250. https://doi.org/10.47750/QAS/23.190.26.

World Bank, 2005. *Introduction to poverty analysis*. World Bank. Available at: https://documents1.worldbank.org/curated/en/775871468331250546/pdf/902880WP0Box380okPovertyAnalysisEng.pdf

Zebua, W.N., Bakce, D. and Hadi, S., 2015. Analysis of the dominant factors that influence poverty in Riau Province. *Indonesian Journal of Agricultural Economics (IJAE)*, 6(2), pp.158-167.

Zhou, Y., Li, Y., Li, W., Li, F. and Xin, Q., 2022. Ecological responses to climate change and human activities in the arid and semi-arid regions of Xinjiang in China. *Remote Sensing*, 14(16), pp. 911. https://doi.org/10.3390/rs14163911.

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