Ecological Fiscal Transfers and Regional Environmental Performance: The Moderating Role of Economic Growth

Nadia Triana Safitri[1]
Novi Dirgantari[2]
Sri Wahyuni[3]
Edi Joko Setyadi[4]
[1,2,3,4]Faculty of Economics and Business, Universitas Muhammadiyah Purwokerto, Indonesia
Correspondences* **: novidirgantari@ymail.com

ABSTRACT

This study examines the influence of Ecological Fiscal Transfers (EFT) and economic growth on regional environmental performance in Indonesia. Persistent environmental degradation—including deforestation, water pollution, and low Environmental Quality Index (EQI) scores—suggests a gap between ecological fiscal policy design and realised outcomes. Adopting a quantitative approach, the study uses secondary data from 32 local governments receiving EFT during 2021–2023. Multiple linear regression and moderation analysis are employed to assess the effects of EFT, economic growth, and their interaction on environmental performance. The results indicate that neither EFT nor economic growth has a statistically significant effect on environmental performance, and economic growth does not exhibit a moderating role. These findings underscore the limited effectiveness of current EFT implementation, which appears constrained by coordination challenges, budgetary inefficiencies, and institutional capacity. The study recommends strengthening inter-agency coordination and adopting performance-based evaluation mechanisms to support the design and implementation of more effective ecological fiscal policies.

Keywords: Ecological Fiscal Transfers; Environmental Performance; Economic Growth

e-ISSN 2302-8556

Vol. 35 No. 8
Denpasar, 30 Agustus 2025
Hal. 2281-2292

DOI:
10.24843/EJA.2025.v35.i08.p20

PENGUTIPAN:
Safitri, Dirgantari, Wahyuni, dan Setyadi. (2025). Ecological Fiscal Transfers and Regional Environmental Performance: The Moderating Role of Economic Growth. *E-Jurnal Akuntansi*, 35(10), 2336-2349

RIWAYAT ARTIKEL:
Artikel Masuk:
3 Juni 2025
Artikel Diterima:
10 Agustus 2025

Transfer Fiskal Ekologis dan Kinerja Lingkungan Regional: Peran Moderasi Pertumbuhan Ekonomi

ABSTRAK

Penelitian ini bertujuan untuk menganalisis pengaruh Ecological Fiscal Transfers (EFT) dan tingkat pertumbuhan ekonomi terhadap kinerja lingkungan daerah di Indonesia. Fenomena penurunan kualitas lingkungan, seperti deforestasi, pencemaran air, serta rendahnya Indeks Kualitas Lingkungan Hidup (IKLH), menunjukan adanya kesenjangan antara kebijakan fiskal ekologis dan hasil yang diharapkan. Penelitian ini menggunakan pendekatan kuantitatif dengan data sekunder dari 32 pemerintah daerah penerima EFT pada tahun 2021-2023. Analisis dilakukan melalui regresi linear berganda dan uji moderasi untuk menguji pengaruh EFT, pertumbuhan ekonomi, serta interaksinya terhadap kinerja lingkungan. Hasil penelitian menunjukan bahwa EFT maupun tingkat pertumbuhan ekonomi tidak berpengaruh signifikan terhadap kinerja lingkungan, dan tidak terdapat efek moderasi dari pertumbuhan ekonomi. Temuan ini menegaskan keterbatasan implementasi EFT akibat tantangan koordinasi, efektivitas penganggaran, dan kesiapan kelembagaan. Studi ini merekomendasikan perlunya koordinasi lintas lembaga serta evaluasi berbasis kinerja dalam merancang kebijakan fiskal ekologis yang lebih efektif.

Kata Kunci: Ecological Fiscal Transfers; Kinerja Lingkungan; Pertumbuhan Ekonomi.

Artikel dapat diakses : https://ejournal1.unud.ac.id/index.php/akuntansi/index

INTRODUCTION

Ecological Fiscal Transfers (EFT) have become an increasingly prominent policy instrument for environmental management at the local level. Under this program, regional governments receive fiscal incentives from the central government based on their performance in protecting and preserving the environment. Through these transfers, local authorities are expected to strengthen environmental management, including reducing carbon emissions, conserving biodiversity, and improving waste management. In essence, EFT are designed to integrate fiscal policy with environmental policy within a sustainable development framework. For example, Cheng et al. (2023) find that EFT in China play a significant role in improving environmental performance by encouraging local governments to adopt environmental conservation policies more seriously. Similarly, Pirmana et al. (2021) report that EFT implementation in Indonesia shows potential to enhance environmental management, although it still faces challenges related to administrative capacity and inter-agency coordination.

When implemented effectively, EFT can exert a substantial positive impact on local environmental management. They function as fiscal incentives that motivate local governments to improve environmental performance through various initiatives, such as lowering carbon emissions, conserving biodiversity, improving waste treatment, and protecting ecosystems. By linking central government transfers to regional environmental performance, EFT can help reinforce local governments' commitment to environmental sustainability.

However, the challenges associated with EFT implementation in Indonesia are multifaceted. One major concern is ongoing forest degradation and declining environmental quality driven by development pressures. Continuous development activities have adversely affected forest cover, water availability, and pollution levels. According to the 2018 Strategic Environmental Assessment (Kajian Lingkungan Hidup Strategis, KLHS) incorporated in the National Medium-Term Development Plan (Rencana Pembangunan Jangka Menengah Nasional, RPJMN), Indonesia's forest cover is projected to fall from around 50 percent of total land area in 2017 to approximately 45 percent by 2045. This reduction is expected to exacerbate water scarcity, particularly in regions with already low forest cover such as Java, Bali, and Nusa Tenggara. Projections indicate that by 2030, water scarcity in these regions will worsen, with the share of water crisis areas rising from 6 percent in 2000 to 9.6 percent by 2045. At the same time, ideal habitats for endangered species are shrinking: by 2045, the area of ideal habitats in Sumatra, Java, Kalimantan, and Sulawesi is estimated to decline to 49.7 percent from 80.3 percent previously (Awal et al., 2019).

These developments indicate that environmental protection efforts must proceed in tandem with sustainable development. Achieving sustainable environmental development has been articulated as one of the missions of the administration of President Joko Widodo and Vice President K.H. Ma'ruf Amin. This mission underpins the formulation of development strategies that explicitly consider environmental carrying capacity, disaster risk, and climate change. The strategies include improving environmental quality, enhancing resilience to disasters and climate change, and promoting low-carbon development. These priorities are reflected in the RPJMN 2020–2024, which identifies "realizing

sustainable environmental development" as one of the seven national development agendas (Lampiran Peraturan Presiden no. 18 2020).

Another challenge in implementing EFT in Indonesia concerns the limited capacity of local governments to allocate and manage budgets for environmental protection functions. A study by Seknas FITRA (2013) shows that the average budget allocation for environmental protection at the local government level remains very low—below 2 percent of total regional expenditure during 2016–2021. This constraint inhibits the execution of concrete measures to improve environmental quality and leads to underutilisation of EFT funds by local governments.

Evidence from prior studies also indicates substantial variation in EFT effectiveness across regions. Ruggiero et al. (2022), for example, show that although EFT strengthened conservation efforts in some areas of Brazil, the program faced limitations related to coverage and local governments' capacity to use the fiscal incentives effectively. Similarly, Lima de Paulo Camões (2019), in a study of the state of Minas Gerais, finds that high transaction costs and regional disparities in capacity hinder uniform EFT implementation. Their findings indicate that only about 35 percent of local governments were able to optimise their EFT allocations, while the remainder faced significant technical and human resource constraints.

Beyond fiscal incentives, the stage of regional economic growth appears closely related to EFT effectiveness. Liu et al. (2024) report that regions with higher gross domestic product (GDP) per capita experienced greater increases in emissions following receipt of EFT funds. Conversely, regions with lower GDP per capita often failed to meet emission reduction targets despite receiving transfers. Evidence from several Chinese provinces indicates notable differences in post-EFT carbon emission reductions: higher-income provinces such as Beijing and Shanghai recorded larger reductions than lower-income provinces such as Yunnan and Guizhou. This pattern suggests that the level of economic development significantly influences how effectively regions can deploy EFT funds. The proportion of funds received by each province also tends to be positively correlated with both economic growth and environmental quality (Lin et al. 2020; Cao et al., 2022).

Table 1. GDP per Capita Data

Region Category	GDP per Capita (USD)	Emission Reduction (%)
Beijing	18,000	18
Shanghai	12,000	12
Yunnan	4,000	3
Guizhou	2,500	2

Source: (Lin et al. 2020)

The data indicate a clear relationship between Gross Domestic Product (GDP) per capita and emission reduction outcomes across regions following Ecological Fiscal Transfer (EFT) allocations. Regions with higher GDP per capita—such as Beijing (USD 18,000) and Shanghai (USD 12,000)—received EFT allocations of 13.2 million yuan and 19.2 million yuan, respectively, and achieved emission reductions of 18% and 12% (Lin et al., 2020). By contrast, lower-income regions

such as Yunnan (USD 4,000) and Guizhou (USD 2,500), which received EFT allocations of less than 10 million yuan (Li & Wang, 2022), managed to reduce emissions by only 3% and 2%. These findings suggest that regions with stronger economies and larger EFT allocations have greater capacity to implement environmental policies and invest in cleaner technologies (Xie et al., 2021). Larger financial resources enable regions such as Beijing and Shanghai to achieve more substantial emission reductions than lower-income regions such as Guizhou. Accordingly, economic disparities appear to be a key determinant of cross-regional differences in the success of emission reduction policies.

In Indonesia, environmental pollution remains a major policy challenge. According to Bappenas (2021), Biological Oxygen Demand (BOD) and Chemical Oxygen Demand (COD) levels in several regions are projected to increase in 2024 and 2030, indicating a deterioration in water quality. Efforts to reduce national waste generation also remain suboptimal, with approximately 28.4% of total waste unmanaged and a large portion of plastic waste entering the oceans (KLKH, 2024). This situation disrupts marine ecosystems, including mass mortality of marine species due to plastic debris (World Bank, 2021).

Effective implementation of Ecological Fiscal Transfers offers a potential pathway to address these environmental problems, provided it is accompanied by measures to strengthen local capacity and increase budget allocations for environmental protection functions. When these elements are integrated, EFT can become a more effective policy instrument for supporting sustainable development in line with environmental conservation efforts in Indonesia (Chen et al., 2025).

This study seeks to close the identified research gap by developing a model that integrates fiscal incentive variables through EFT with regional stages of economic development. Using a more comprehensive approach, it examines the interaction between these variables and their combined impact on local environmental performance. The study is expected to generate new insights that inform the design of more effective EFT policies and provide practical recommendations for local governments in improving sustainable environmental management. The novelty of this research lies in its holistic framework, which simultaneously incorporates fiscal incentives, economic growth, and environmental performance—an approach rarely adopted in prior work. By employing empirical data and a comprehensive analytical model, this study aims to provide broader evidence on EFT implementation across regions with differing characteristics.

Ecological Fiscal Transfers are central-to-local fiscal transfer mechanisms that incorporate environmental indicators such as forest area, water quality, and the Environmental Quality Index into allocation formulas. The main objective of EFT is to provide fiscal incentives that strengthen regional commitment and performance in environmental conservation and sustainable natural resource management (Wicaksono et al., 2024). In Indonesia, EFT was initially introduced at the subnational level—for example in Papua and North Kalimantan—before gaining recognition within the national fiscal policy framework. Both the Ministry of Finance and Bappenas have acknowledged EFT's potential as a strategic

instrument to better align development policy with environmental protection (Aini & Meliala, 2023).

Environmental performance reflects the effectiveness of a country, region, or institution in managing and protecting environmental quality, natural resources, and contributions to climate change mitigation. Environmental performance indicators cover various dimensions, including air and water quality, biodiversity, waste management, and carbon emissions (Esty et al., 2022). In Indonesia, environmental performance is also captured through the Environmental Quality Index (Indeks Kualitas Lingkungan Hidup, IKLH) issued by the Ministry of Environment and Forestry (KLHK). The IKLH combines three key indicators: water quality, air quality, and land cover. This index is intended to encourage local governments to strengthen environmental protection efforts through policy and budget planning (KLHS-RPJPN Bappenas 2020). Prior studies also link environmental performance to governance quality, regional fiscal capacity, and public participation, finding that jurisdictions with stronger governance and higher civic engagement tend to record better environmental quality indices. Because environmental indicators serve as the basis for calculating ecology-based fiscal transfers, such as EFT, environmental performance simultaneously reflects outcomes and shapes future fiscal allocations.

Economic growth is a key indicator of a region's capacity to generate output, improve social welfare, and support sustainable development. Common measures of economic growth include GDP per capita, economic structure, the Human Development Index (HDI), and poverty rates (Todaro and Smith, 2020). Economic growth also influences the ability of regions to absorb and utilise development funds effectively. Regions with stronger fiscal and institutional capacity tend to manage public funds more efficiently and achieve more substantial development outcomes.

This section draws on prior studies relevant to the present research and summarises their findings to position this study and clarify its originality in light of earlier work.

Cao et al. (2024) examined the incentive and coordination effects of EFT on environmental quality in China using a dynamic spatial panel model. Their results indicate that EFT can encourage local governments to improve environmental quality and reduce negative interregional competition (Cao et al. 2021). However, the transfers tend to be compensatory rather than genuinely incentive-based and therefore do not fully stimulate ecological improvement. The study also reports that non-ecological transfers (non-EFT) fail to generate meaningful incentive or coordination effects.

Liu et al. (2024) analysed the implementation of interregional EFT in Hubei Province. They found that, although the system can potentially promote environmental improvements, its impact remains weak and largely complementary to institutional incentives. The authors recommend that fund distribution should better reflect the ecological value contributed by each region to enhance policy effectiveness. These findings reinforce those of Cao et al. (2022), who also conclude that, despite the theoretical design, the incentive effects of EFT are still limited.

In Indonesia, Pirmana et al. (2021) investigated environmental cost assessment as input for improving the national environmental-economic accounting system. Using damage cost and net present value (NPV) approaches, they estimate that environmental costs amounted to 13% of GDP in 2010, driven largely by energy and mineral depletion and air pollution. The study underscores the importance of environmental damage data for national policy formulation and for integrating environmental costs into the national accounting system developed by Statistics Indonesia (BPS).

These three studies share a common focus on fiscal policies for environmental protection and the importance of integrating environmental aspects into fiscal decision-making. Their key differences lie in context and methodology. The Chinese studies (e.g. Yan et al., 2024) concentrate on the effectiveness of EFT, emphasising their incentive and coordination roles across regions, whereas Pirmana et al. (2021) focus on incorporating environmental cost estimates into Indonesia's environmental-economic policy framework. Methodologically, Pirmana et al. adopt a more accounting-oriented economic approach, while the Chinese studies primarily analyse local government responses to fiscal incentives.

This study focuses on two independent variables—Ecological Fiscal Transfers (EFT) and the economic growth rate—and examines whether the relationship between EFT and environmental performance is moderated by economic growth. Based on the theoretical framework, the following hypotheses are proposed: H1: EFT positively affect regional environmental performance. H2: Economic growth positively affects regional environmental performance. H3: Economic growth moderates the effect of EFT on regional environmental performance.

The placement of economic growth as a moderating variable is grounded in the framework of Habib et al. (2025), who argue that economic growth combined with appropriate green investment fosters sustainable development. Such sustainable growth, in turn, encourages eco-friendly innovation and reduces ecological footprints, effects that are reflected in the Regional Environmental Performance Index used here as a proxy for environmental performance (Habib et al. 2025).

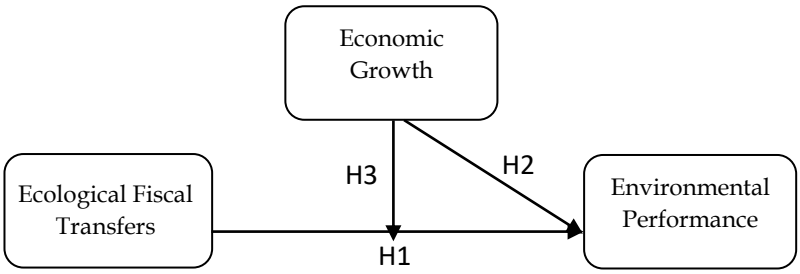

Figure 1. Research Model

Source: Research Data, 2024

RESEARCH METHODOLOGY

This study employs a quantitative research method with an explanatory approach to examine the effect of Ecological Fiscal Transfers (EFT) on regional environmental quality. The data used are secondary and drawn from local government financial reports, regional environmental quality indicators published by the National Development Planning Agency (Bappenas), and official documents related to ecological fiscal transfers.

The population comprises all local governments in Indonesia that receive ecological fiscal transfers. The sample was selected using a purposive sampling technique, including only regions that both receive EFT and have complete data for the observation period. The selected regions are based on data from The Asia Foundation (TAF) for 2021–2023 and include provinces such as Aceh, West Kalimantan, North Kalimantan, South Sulawesi, Central Sulawesi, West Nusa Tenggara, and West Papua, as well as several regencies and cities, including Bener Meriah, Sabang, Agam, Siak, and Trenggalek, among others (Aini & Meliala 2023).

Data were collected through documentary analysis of relevant reports and official publications. The data set was then analysed using SPSS, employing multiple linear regression and moderation tests to assess whether Ecological Fiscal Transfers and Economic Growth influence Environmental Performance, and to examine the interaction effects between these variables.

In this research, Ecological Fiscal Transfers are measured using revenue-sharing from the forestry sector. The revenue-sharing mechanism between the central and regional governments is considered to create opportunities for more strategic budget allocation to support environmental conservation (Gulfino Guevarrato, 2022). The calculation of Ecological Fiscal Transfers follows the formula established by the Directorate General of Fiscal Balance (DJPK, 2022) as follows:

EFT = 80% × Regional Share × (Non-Tax Revenue from Natural Resources in a Specific Region / Total National Non-Tax Revenue)……..(1)

Where:

EFT	=	Ecological Fiscal Transfers
Regional Share	=	portion of revenue-sharing funds received by the region
Regional Non-Tax Revenue	=	non-tax state revenue from natural resources in a specific region
National Non-Tax Revenue	=	total national non-tax revenue from natural resources across all regions

Economic growth is a key indicator for assessing the success of regional development. In the regional context, it is commonly proxied by Gross Regional Domestic Product (GRDP) at current prices, which reflects the total value added of goods and services produced by all business units within a region during a given period. Sukirno (2006) defines economic growth as a long-term process of increasing the capacity to produce goods and services within a country or region, as reflected in rising national GDP or regional GRDP. Economic growth is calculated as follows:

Economic Growth=GRDP at current prices in each regency/city/province

The measurement of economic growth in this study uses GRDP data at current prices obtained from the Central Bureau of Statistics (BPS), which publishes annual GRDP reports. GRDP at current prices reflects the nominal value of economic activity and forms the basis for analysing quantitative growth trends over time. Using GRDP as an indicator enables the assessment of a region's capacity to increase the production of goods and services and to expand its economic base. GRDP data are also essential for examining the relationship between economic growth, regional disparities, environmental management, and the effectiveness of fiscal transfer utilisation.

The environmental performance of local governments reflects the extent to which a region has achieved sustainable development objectives in the environmental domain. The assessment covers aspects such as emission reduction, waste management, natural resource conservation, and climate change mitigation (Permen LHK Nomor 27 2021). Environmental performance is proxied by the Environmental Quality Index (Indeks Kualitas Lingkungan Hidup, IKLH), a composite index derived from three main components: the Water Quality Index (IKA), the Air Quality Index (IKU), and the Land Cover Quality Index (IKTL). The formula is as follows:

IKLH = (0,376 × IKA) + (0,405 × IKU) + (0,219 × IKTL)…(2)

(Regulation of the Minister of Environment and Forestry No. 27 of 2021).

Where:

IKLH = Environmental Quality Index
IKA = Water Quality Index
IKU = Air Quality Index
IKTL = Land Cover Quality Index

Data on IKLH were obtained from the Performance Accountability Reports of Government Agencies (LAKIP/LKJIP) of each province, regency, and city for the period 2021–2023. This index provides a quantitative overview of regional environmental conditions and management performance across Indonesia.

RESULTS AND DISCUSSION

This study used data from local governments that planned and implemented Ecological Fiscal Transfers (EFT), as recorded by The Asia Foundation (TAF) during 2021–2023. The total population consisted of 32 local governments, yielding 96 total observations. However, 33 data points were identified as outliers, resulting in a final dataset of 63 valid observations.

Table 2. Results of the Classical Assumption Tests

Test	Criteria	Result	Conclusion
Normality (One Sample K-S Test)	Sig. value > 0.05	Asymp. Sig (2-tailed) = 0.200	The data are normally distributed.
Multicollinearity	VIF value ≤ 10 and ≥ 0.10	Ecological Fiscal Transfers = VIF 1.000 Economic Growth Rate = VIF 1.000	There is no multicollinearity in this study.
Heteroskedasticity (Park Test)	Sig. value > 0.05	Ecological Fiscal Transfers Sig. = 0.649 Economic Growth Rate Sig. = 0.216	There is no heteroskedasticity in this study.
Autocorrelation (Durbin–Watson)	du < dw < 4 – du	du = 1.50 dw = 1.575 4 – 1.50 = 2.50 1.50 < 1.575 < 2.50	There is no positive or negative autocorrelation in this study.

Source: Research Data, 2024

Table 3. Multiple Linear Regression Results

Model	Unstandardized Coefficients (B)	t	Sig.
(Constant)	153.676	12.899	0.000
Ecological Fiscal Transfers (X)	-0.001	-0.376	0.716
Economic Growth Rate (Z)	-1.341E-5	-1.477	0.151

Source: Research Data, 2024

Table 4. Adjusted R Square Results

Model	R	R Square	Adjusted R Square	Sig. F
Linear Regression	0.276	0.076	0.010	0.329

Source: Research Data, 2024

The regression results show that the Ecological Fiscal Transfers variable has a coefficient of -0.001 with a significance value of 0.716, while the Economic Growth Rate (EGR) variable has a coefficient of -1.341E-5 with a significance value of 0.151. Since both significance values exceed 0.05, it indicates that neither EFT nor EGR has a statistically significant effect on regional environmental performance. This finding is further supported by the adjusted R^2 value of 0.010, which implies that the model explains only 1% of the variance in the dependent variable, while the remaining 99% is explained by factors outside the model.

When a moderation regression analysis was conducted by introducing the interaction term between EFT and EGR (EFT×EGR), the results again showed no significant influence on regional environmental performance, as presented in the following table.

Table 5. Moderation Regression Results

Model	Unstandardized Coefficients (B)	t	Sig.
(Constant)	154.193	13.099	0.000
Ecological Fiscal Transfers (X)	-0.011	-1.360	0.185
Economic Growth Rate (Z)	-2.569E-5	-1.980	0.058
EFT×EGR	3.477E-8	1.310	0.201

Source: Research Data, 2024

The significance value of the moderation variable (EFT×EGR) is 0.201, which exceeds the 0.05 threshold. This indicates that the Economic Growth Rate does not moderate the relationship between Ecological Fiscal Transfers and regional environmental performance. Accordingly, the third hypothesis (H3), which posits a moderating effect, is not supported.

These findings suggest that although, in theory, Ecological Fiscal Transfers (EFT) are designed to enhance environmental performance by providing fiscal incentives to local governments, such incentives have not yet produced a measurable impact in practice. This may reflect limited implementation of environmental protection budgets at the regional level and insufficient technical capacity to manage EFT funds effectively.

Furthermore, the Economic Growth Rate, proxied by Gross Regional Domestic Product (GRDP), also fails to adequately explain variations in environmental performance. Economically advanced regions do not necessarily allocate their fiscal resources proportionally to environmental management. This is consistent with previous studies indicating that the mere availability of funds does not guarantee effective utilization unless it is accompanied by robust coordination and institutional capacity.

These results differ from studies such as Cao et al. (2022), which found a positive effect of EFT on environmental performance in certain regions of China. The divergence in findings is likely driven by differences in institutional context and regional readiness. In Indonesia, EFT allocations may not yet be treated as a strategic priority at the regional level, or the allocation formula may be too general and insufficiently linked to concrete, measurable environmental performance outcomes.

Overall, the results imply that the success of EFT policies depends not only on the volume of transferred funds but also on cross-sectoral coordination, institutional preparedness, and the political will of local governments to prioritize environmental sustainability in their development agendas. These institutional and policy dimensions warrant closer examination in future research.

In this study, three main hypotheses were tested. The first hypothesis (H1), which proposed that Ecological Fiscal Transfers positively affect regional environmental performance, was not supported because the estimated coefficient was statistically insignificant. Similarly, the second hypothesis (H2), which posited that the Economic Growth Rate influences environmental performance, was also not empirically confirmed. The interaction test for moderation further showed that the third hypothesis (H3), which predicted that Economic Growth would moderate the relationship between EFT and environmental performance, was not supported.

The absence of significant relationships yields several important interpretations. First, EFT allocations are likely not yet determined on the basis of actual environmental performance, but rather follow formula-based mechanisms, such as the proportion of Non-Tax State Revenue (PNBP) derived from natural resources. This renders the incentive largely administrative rather than performance-based, weakening its potential to drive improvements in environmental indicators. Prior research in China (Liu et al., 2024) found that when EFT is designed as a performance-based grant, fiscal incentives can significantly reduce emissions and improve ecosystem quality. In the Indonesian context, however, the data indicate that most regions have not shown consistent improvements in environmental performance despite receiving EFT funds.

Second, the regional economic growth rate, measured by nominal GRDP, does not adequately capture institutional capacity or the quality of environmental management. Regions with higher GRDP may prioritize economic expansion over ecological protection, giving rise to trade-offs between growth and environmental sustainability—a pattern frequently observed in developing economies. This is in line with the KLHS-RPJPN Bappenas (2020) warning that regions with rapid economic growth often experience intensified environmental pressures, including deforestation, water pollution, and inadequate waste management.

Third, the interaction term between Ecological Fiscal Transfers and the Economic Growth Rate (EFT×EGR) is also statistically insignificant. This reinforces the notion that even regions with greater fiscal capacity or stronger economic growth do not necessarily amplify the impact of EFT on environmental performance. A study by Liu, Xiong, and Zhang (2024) in Hubei Province similarly reported that the distribution of funds does not always correlate with improved environmental outcomes, particularly when fiscal incentives are not accompanied by monitoring mechanisms, budget transparency, and adequate managerial capacity.

These findings underscore the importance of integrating inter-agency coordination as a critical factor linking fiscal incentives to environmental performance. Although coordination variables were not explicitly included in the regression model in this study, the theoretical and methodological discussion highlights that cross-sectoral coordination among regional planning agencies (Bappeda), environmental agencies, and local finance offices is crucial to ensuring that EFT funds are genuinely directed toward environmental conservation. As emphasized by Dwiyanto (2008) and Siregar & Wahyudi (2019), without effective coordination, fiscal incentives from the central government are unlikely to achieve their intended outcomes.

In summary, the findings carry important implications for policy design in Indonesia. While Ecological Fiscal Transfers constitute a promising instrument of fiscal policy, their effectiveness in improving environmental performance remains limited when assessed solely through the lenses of fund allocation and economic growth. A more comprehensive policy framework is required, including the strengthening of inter-agency coordination mechanisms, the adoption of performance-based evaluation systems, and the integration of fiscal instruments with data-driven environmental governance. Future research is encouraged to incorporate variables related to coordination and environmental governance

directly into the analytical model to enable a more complete assessment of causal relationships.

CONCLUSION

Based on the empirical analysis, this study concludes that Ecological Fiscal Transfers (EFT) and the Economic Growth Rate do not exert a statistically significant influence on regional environmental performance. Moreover, the interaction term shows that economic growth does not moderate the relationship between EFT and environmental performance. Taken together, these results indicate that, although EFT schemes and regional economic conditions are theoretically relevant, they are not sufficient—within the present model specification—to explain observed variations in regional environmental performance.

This study is subject to several limitations. Most notably, the measurement of Ecological Fiscal Transfers is restricted to revenue-sharing indicators from the forestry sector. As a consequence, the EFT data used are relatively narrow in scope and may not fully capture the broader implementation and design features of ecological fiscal policy at the regional level. Future research is therefore encouraged to employ a more comprehensive set of EFT indicators that reflect the various design dimensions commonly used by local governments—such as performance-based components, multi-sectoral ecological criteria, and earmarking mechanisms. Such refinements would permit wider data coverage and enable a more nuanced assessment of policy effectiveness in supporting environmentally sustainable regional development in Indonesia. The main contribution of this study is to provide empirical evidence on the currently limited effectiveness of EFT in improving environmental performance, while at the same time offering policy-relevant insights for strengthening the design of ecological fiscal instruments so that they better reflect regional conditions and implementation capacity. From an academic standpoint, the study extends the literature by integrating EFT, environmental performance, and economic growth into a single analytical framework, thereby laying a foundation for subsequent work that incorporates governance quality, institutional capacity, and inter-agency coordination into the evaluation of ecological fiscal policy.

REFERENCE

Aini & Meliala. 2023. *Ecological Fiscal Transfer (EFT) Berbasis Kinerja Di Indonesia*.

Awal, Rancangan, Kementerian Perencanaan, Pembangunan Nasional, / Badan, Perencanaan Pembangunan, and Nasional (Bappenas. 2019. *Republik Indonesia Rencana Pembangunan Jangka Menengah Nasional (RPJMN) 2020-2024*.

Bappenas. 2021. *Indonesia Long-Term Strategy for Low Carbon and Climate Resilience 2050 (Indonesia LTS-LCCR 2050)*.

Cao, Hongjie, Meina Li, Fengqin Qin, Yankun Xu, Li Zhang, and Zhifeng Zhang. 2022. "Economic Development, Fiscal Ecological Compensation, and Ecological Environment Quality." *International Journal of Environmental Research and Public Health* 19(8). doi:10.3390/ijerph19084725.

Cao, Hongjie, Yu Qi, Jianwei Chen, Shuai Shao, and Shixian Lin. 2021. "Incentive and Coordination: Ecological Fiscal Transfers' Effects on Eco-Environmental Quality." *Environmental Impact Assessment Review* 87(182). doi:10.1016/j.eiar.2020.106518.

Chen, Weini, Dejun Han, Yu Zhan, and Bo Chen. 2025. "The Impact of Rural Population Decline on the Economic Efficiency of Agricultural Carbon Emissions: A Case Study of the Contiguous Karst Areas in Yunnan–Guizhou Provinces, China." *Agriculture (Switzerland)* 15(10). doi:10.3390/agriculture15101081.

Cheng, Yuhong, Ben Ma, and Yidan Sun. 2023. "Does Central Ecological Transfer Payment Enhance Local Environmental Performance? Quasi-Experimental Evidence from China." *Ecological Economic* 212. doi:https://doi.org/10.1016/j.ecolecon.2023.107920.

DJPK. 2022. "Daftar Alokasi Dana Transfer Ke Daerah Dan Dana Desa Tahun Anggaran 2022. Kementerian Keuangan Republik Indonesia. Https://Djpk.Kemenkeu.Go.Id/?Portfolio=Daftar-Alokasi-Tkdd-2022-Prov-Aceh."

Dwiyanto, Agus. 2008. "Mengembalikan Kepercayaan Publik Melalui Reformasi Birokrasi."

Esty et al. 2022. *Environmental Performance Index 2020*.

Gulfino Guevarrato, Gusmansyah Gusmansyah, Rizka Fitriyani. 2022. "Buku Panduan Pelembagaan Dan Replikasi Transfer Fiskal Berbasis Ekologi (EFT)."

Habib, Yasir, Noor Raida Abd Rahman, Shujahat Haider Hashmi, and Minhaj Ali. 2025. "Green Finance and Environmental Decentralization Drive OECD Low Carbon Transitions." *Scientific Reports* 15(1). doi:10.1038/s41598-025-11967-y.

KLHS-RPJPN Bappenas. 2020. "Kajian Lingkungan Hidup Strategis Rencana Pembangunan Jangka Menengah Nasional." : 2020–24.

KLKH. 2024. "Sistem Informasi Pengelolaan Sampah Nasional."

Lampiran Peraturan Presiden no. 18. 2020. *Lampiran Peraturan Presiden Republik Indonesia No. 18 Tahun 2020 Tentang Rencana Pembangunan Jangka Menengah Nasional 2020-2024 Narasi Republik Indonesia*.

Li, Xing, and Daoping Wang. 2022. "Does Transfer Payments Promote Low-Carbon Development of Resource-Exhausted Cities in China?" *Earth's Future* 10(1). doi:10.1029/2021EF002339.

Lima de Paulo Camões, Pedro Jorge Sobral. 2019. "Ecological Fiscal Transfers for Biodiversity Conservation Policy: A Transaction Costs Analysis of Minas Gerais, Brazil." *Ecological Economic* 166. doi:https://doi.org/10.1016/j.ecolecon.2019.106425.

Lin, Yongsheng, Zhanfeng Dong, Wei Zhang, and Hongyu Zhang. 2020. "Estimating Inter-Regional Payments for Ecosystem Services: Taking China's Beijing-Tianjin-Hebei Region as an Example." *Ecological Economics* 168. doi:10.1016/j.ecolecon.2019.106514.

Liu, Mengba, Yanfei Xiong, and Anlu Zhang. 2024a. "Can China's Cross-Regional Ecological Fiscal Transfers Help Improve the Ecological Environment?—Evidence from Hubei Province." *Land* 13(8). doi:10.3390/land13081132.

Liu, Mengba, Yanfei Xiong, and Anlu Zhang. 2024b. "Can China's Cross-Regional Ecological Fiscal Transfers Help Improve the Ecological Environment?—Evidence from Hubei Province." *Land* 13(8). doi:10.3390/land13081132.

Permen LHK Nomor 27. 2021. *Peraturan Menteri Lingkungan Hidup Dan Kehutanan Indonesia. 27 Tahun 2021*. www.peraturan.go.id.

Pirmana, Viktor, Armida Salsiah Alisjahbana, Arief Anshory Yusuf, Rutger Hoekstra, and Arnold Tukker. 2021a. "Environmental Costs Assessment for Improved Environmental-Economic Account for Indonesia." *Journal of Cleaner Production* 280: 124521. doi:10.1016/j.jclepro.2020.124521.

Pirmana, Viktor, Armida Salsiah Alisjahbana, Arief Anshory Yusuf, Rutger Hoekstra, and Arnold Tukker. 2021b. "Environmental Costs Assessment for Improved Environmental-Economic Account for Indonesia." *Journal of Cleaner Production* 280. doi:10.1016/j.jclepro.2020.124521.

Ruggiero, P. G.C., A. Pfaff, P. Pereda, E. Nichols, and J. P. Metzger. 2022. "The Brazilian Intergovernmental Fiscal Transfer for Conservation: A Successful but Self-Limiting Incentive Program." *Ecological Economics* 191. doi:10.1016/j.ecolecon.2021.107219.

Seknas FITRA. 2013. *Sekretariat Nasional Forum Indonesia Untuk Transparansi Anggaran National Secretariat-Indonesian Forum for Budget Transparency End of Year Report: 10 Budget Policy Findings from 2013, Politicisation and the Tormenting of Society*. www.seknasfitra.org,.

Sukirno, Sadono. 2006. "Ekonomi Pembangunan: Proses, Masalah Dan Dasar Kebijakan."

Todaro, Michael P, and Stephen C Smith. 2020. *Economic Development*.

Wicaksono, Baskoro, Auradian Marta, Rury Febrina, and M Rafi. 2024. "Ecological Fiscal Transfer."

World Bank. 2021. "Indonesia Marine Debris Hotspot Rapid Assessment."

Xie, Zihan, Rong Wu, and Shaojian Wang. 2021. "How Technological Progress Affects the Carbon Emission Efficiency? Evidence from National Panel Quantile Regression." *Journal of Cleaner Production* 307. doi:10.1016/j.jclepro.2021.127133.

Yan, Haijuan, Xiaofei Hu, and Jinliang Chen. 2024. "Effect of Eco-Compensation Policy on the Environmental Quality Varies with City Size and Location in China's Yangtze River Economic Belt." *Environment, Development and Sustainability*. doi:10.1007/s10668-024-04900-2.