

A Maritime-Based Fiscal Development Strategy Model in East Kalimantan Province, Indonesia

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Abstract

This study integrates economic and geospatial approaches to analyze the effectiveness of capital expenditures, fund allocation, and physical monitoring in regional development and improving community welfare, particularly in Kalimantan. This integration aims to provide a more comprehensive understanding of the contribution of fiscal policy to regional development. Fiscal instruments such as the General Allocation Fund (DAU), Special Allocation Fund (DAK), and Regional Original Revenue (PAD) are analyzed to determine the extent to which each impacts regional economic growth and improves the quality of life of the community. In addition to the fiscal aspect, this study also evaluates the use of geospatial technology in monitoring the progress of physical development in the field. This technology was assessed in terms of accuracy, efficiency, and its potential to support real-time development planning and monitoring processes. A quantitative approach was used, applying panel data regression models, Partial Least Squares (PLS) analysis, and spatial analysis to comprehensively describe the relationships between variables. The results of the study indicate that the integration of fiscal and spatial data can provide more accurate and relevant information for decision-making in regional development planning. The combination of these two approaches has been proven to strengthen the effectiveness of development policies and can be used as a reference in developing data-driven, sustainable development strategies that are oriented towards equitable distribution of community welfare.

Keyword: Capital Expenditure, General Allocation Fund, Economic Growth, Regional Development



INTRODUCTION

Regional development is a top priority under Indonesia's regional autonomy system. Granting greater authority to local governments is expected to make the development process more effective, tailored to local needs, and bring public services closer to the community. However, in practice, many regions still struggle to manage their budgets and optimize their resources (Baek, 2025).

One key issue in regional development is fiscal inequality. Many district and city governments remain heavily dependent on central government transfers, such as the General Allocation Fund (DAU), the Special Allocation Fund (DAK), and the Village Fund. This dependence reflects suboptimal Regional Original Revenue (PAD), an indicator of fiscal independence (Kaur & Negi, 2025). However, in the long term, fiscal independence is crucial for regions to design and implement development policies without always relying on support from the central government (Fitrianasari, 2021).

On the other hand, the government has attempted to encourage development through capital expenditure, particularly in the infrastructure sector (Sulistiyo et al., 2024). The construction of roads, bridges, healthcare facilities, and education facilities is believed to open access, improve connectivity between regions, and stimulate local economic growth. However, the extent to which this capital expenditure impacts Regional Original Income (PAD) remains an important question to be studied (Bapat & Sharma, 2025).

Beyond fiscal aspects, technological developments are also a crucial element in driving development effectiveness. Geospatial technologies, such as the use of drones (UAVs) and LiDAR, have opened up new opportunities for monitoring physical projects and capturing accurate spatial data. This technology is particularly relevant in regions like Kalimantan, which have vast areas, difficult terrain, and limited manual access (Neeraj & Trofimov, 2025).

LITERATURE REVIEW

Regional Fiscal

Regional fiscal policy refers to the financial policies implemented by local governments, including the management of regional revenues and expenditures to support local development. In the context of economic development, regional fiscal policy plays a crucial role in providing infrastructure and public services, and creating a conducive investment climate (Wei & Jiao, 2025). When local governments have adequate fiscal capacity, they can design development programs that are more responsive to the needs of local communities (Nguyen, 2025). Studies on fiscal reform in China show that increased regional fiscal autonomy can





significantly boost local economic growth, particularly in the agricultural and rural industrial sectors.

Fiscal decentralization is the process of transferring fiscal authority from the central government to local governments, aimed at improving efficiency and accountability in public financial management. With decentralization, local governments have the flexibility to determine spending priorities and revenue sources, thus becoming more responsive to local needs. Nguyen (2025), in his essay on fiscal federalism, emphasized that fiscal decentralization can improve the efficiency of resource allocation and strengthen public accountability, provided that fiscal functions and instruments are aligned with the appropriate level of government.

The efficiency of public spending at the regional level is significantly influenced by the fiscal policies implemented, including how transfer funds such as the General Allocation Fund (DAU) and the Special Allocation Fund (DAK) are used. Research in Papua Province shows that fiscal decentralization through transfers has a significant impact on poverty alleviation, especially when combined with economic growth as a mediating variable. However, the efficiency of public spending depends not only on the amount of funds but also on the capacity of regional institutions to plan and implement budgets productively (Saputra, 2025).

Maritime

Maritime affairs encompass all aspects related to the sea, including transportation, trade, fisheries, and coastal resource management. In the context of economic development, maritime areas play a strategic role as inter-state hubs and centers for the distribution of goods. Port cities, for example, have developed as trade and migration hubs, driving local and regional economic growth. Saputra (2025) study shows that port cities are not merely transit points but also dynamic economic centers, with complex social and economic structures and close ties to inland areas.

Maritime affairs also have an important geopolitical dimension, particularly in terms of maritime security and control of international trade routes. The sea is not only an economic space, but also an arena for conflict and diplomacy. Research by Pereira Freitas (2025) on the Red Sea shows how the activities of armed groups like the Houthis can disrupt maritime stability and trigger global geopolitical tensions. This study emphasizes the need for a multilateral approach and active diplomacy to maintain maritime security as a vital route for global trade.

Effective maritime policy is crucial for maintaining the sustainability of marine resources. Maritime nations like Indonesia face significant challenges in managing vast maritime territories, including threats to sovereignty and resource exploitation. This article by Hasyim (2025)





highlights Indonesia's maritime defense strategy through the empowerment of maritime defense areas, which involve communities in maintaining maritime security and sustainability. This approach demonstrates that maritime policy is not only military in nature, but also social and ecological.

Regional Fiscal and Maritime Linkages

Regional fiscal policy plays a crucial role in supporting maritime development, particularly through budget allocations for port infrastructure, coastal management, and maritime economic development. Regional governments with strong fiscal capacity can invest public funds to strengthen maritime connectivity, improve port facilities, and support the fisheries sector. In their study, Roy (2015) emphasized that the government's fiscal role must be tailored to local needs, including within the context of maritime regions with their own economic characteristics.

In an archipelagic nation like Indonesia, synergy between regional fiscal and maritime policies is crucial for maintaining maritime sovereignty and encouraging maritime-based economic growth. Fiscal policies that support port development, maritime surveillance, and coastal community empowerment can strengthen regions' strategic positions in national and international logistics systems. Darma (2019), in their study on federalism and soft budget constraints, demonstrated that fiscal decentralization can strengthen budget discipline and promote efficiency in public sector management, including the maritime sector. Regional fiscal theory emphasizes the importance of diversifying local revenue (PAD) sources. In the context of East Kalimantan, new potential comes from port services, tugboats, ship-to-ship transfers, and anchorage/mooring fees. Pursuant to PM 48 of 2021 concerning Port Concessions, cooperation between regional governments and port business entities serves as a legal instrument to increase local revenue (PAD) without increasing the public's tax burden.

METHOD

This study uses a mixed methods approach, aiming to provide a comprehensive picture, both statistically and descriptively. The quantitative approach is used to examine the influence of variables such as the General Allocation Fund (DAU), capital expenditure, and GRDP on Regional Original Income (PAD) through panel data regression analysis. The data used covers districts/cities on the island of Kalimantan from 2017 to 2021.

Quantitative data sources come from official publications such as the Central Statistics Agency (BPS), Regional Government Financial Reports (LKPD), and the Ministry of Finance. This





data was analyzed using STATA statistical software, using both fixed and random effects models to ensure the validity and consistency of the results.

Meanwhile, a qualitative approach was used to illustrate the use of geospatial technology in development projects, specifically in a case study at PT Hardaya Mining Energy. In this case, UAV-Lidar technology was used to measure coal volume, and the results were compared with manual methods. Data collection was conducted through direct observation, interviews with field technicians, and analysis of project documents.

Furthermore, spatial analysis was conducted to illustrate development disparities between regions in Kalimantan. Spatial data was processed using Geographic Information System (GIS) software to map the distribution of capital expenditure and Regional Original Revenue (PAD) across various districts/cities. This provides a clearer visual understanding of development patterns and the resulting disparities.

With this combination of methods, it is hoped that the research will not only explain the relationship between variables statistically, but also present a strong narrative about how fiscal and technological policies complement each other in supporting effective and sustainable regional development.

RESULTS AND DISCUSSION

This study provides a compelling insight into how government funding, particularly the General Allocation Fund (DAU) and capital expenditures, has not significantly impacted Regional Original Income (PAD) (Hilton & Owusu-Ansah, 2025). This suggests that despite the disbursement of central government funds, regional fiscal independence has not yet been fully established. Conversely, Gross Regional Domestic Product (GRDP) demonstrates a strong influence on Regional Original Income (PAD). This indicates that local economic activity and community productivity contribute more to regional original income than central government transfers (Buthelezi, 2024). However, this does not mean that the General Allocation Fund (DAU) and capital expenditures are useless. On the contrary, these funds play a significant role in financing infrastructure development and public services such as roads, bridges, schools, and hospitals. This investment has an indirect impact on improving the quality of life of the community and opening up new economic opportunities. Therefore, even though it has not directly increased Regional Original Income (PAD), its benefits are still felt by the community (Buthelezi, 2024). In supporting development monitoring, geospatial technology such as UAV-Lidar has proven to be very helpful. This technology can provide highly precise data, for example, to measure coal volume in mines. Compared to manual methods, UAV is much faster, more cost-





effective, and produces highly accurate results (Kim et al., 2025). A case study in Kalimantan showed that the use of UAV-Lidar in mine topographic mapping produced results almost identical to manual weighing, but in a much shorter time and with less labor. This could be an effective solution, especially in the geographically challenging Kalimantan region (Mohammed et al., 2025).

This study also found development disparities among provinces in Kalimantan. East Kalimantan appears more advanced, supported by greater funding allocation and infrastructure development. Meanwhile, Central and North Kalimantan still face challenges in budget absorption and improving welfare (Neeraj & Trofimov, 2025). This underscores the need for a development approach that is not uniform, but tailored to the needs and characteristics of each region. Furthermore, this study found a phenomenon called the flypaper effect, namely the tendency of regions to be more active in spending funds from the central government rather than optimizing their own PAD potential. This indicates a continued high dependence on central funds and signals that regions need to be encouraged to be more fiscally independent. It is important to emphasize that successful regional development, especially in a major context such as the relocation of the national capital to East Kalimantan, is not sufficient with funds alone (Saputra, 2025). Integration of sound fiscal policies, appropriate technology, and accurate spatial data is necessary. This way, development can be planned more precisely, monitored transparently, and the results truly felt by the community.

CONCLUSION

A multidisciplinary approach offers a breath of fresh air for understanding and implementing regional development more comprehensively. In Kalimantan, collaboration between fiscal data utilization and geospatial technology has paved the way for more equitable, insightful, and sustainable development. This approach not only helps design more appropriate policies but also bridges the information gap between regions. Going forward, it is crucial to continue strengthening local capacity and encouraging the widespread use of technology so that development is not only rapid but also addresses the real needs of the community.

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