

EFFECTIVENESS OF PUBLIC SPENDING IN BORDER REGION DEVELOPMENT: A SYSTEMATIC LITERATURE REVIEW ON BUDGET ALLOCATION AND DEVELOPMENT OUTCOMES

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Abstract

This study analyzes the effectiveness of public expenditure in border region development, with particular emphasis on the relationship between budget allocation and development outcomes. Using a Systematic Literature Review (SLR) guided by PRISMA 2020, this article synthesizes 27 selected studies published between 2016 and April 2026 from Scopus, Web of Science, ScienceDirect, and Google Scholar. The review shows that public expenditure contributes to economic growth, social welfare, and regional connectivity, particularly when directed to agriculture, education, infrastructure, health, and local economic development. However, its effectiveness is strongly conditioned by governance quality, institutional capacity, coordination across levels of government, fiscal transparency, and the fit between central planning and local needs. The findings also reveal that agriculture and education spending tend to produce more consistent positive outcomes than other spending categories because they directly strengthen local production capacity, human capital, and long-term welfare indicators. The article contributes analytically by positioning border regions as complex fiscal-policy spaces and by developing a synthesis framework that links budget allocation, priority sectors, implementation quality, local context, inequality, spillover effects, and development outcomes. The practical implication is that border development policy should move beyond budget absorption toward outcome-based, locally grounded, and evidence-based public spending strategies.

Keywords: Budget Allocation, Border Regions, Public Expenditure, Regional Development

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1. Introduction

Public expenditure is a key fiscal instrument for improving societal welfare, particularly through investments in health, education, infrastructure, and local economic development. These sectors improve labor productivity, create employment, and enhance living standards (Castro, 2018; Iyoha & Oyerinde, 2010; Nyasha & Odhiambo, 2019). In developing economies, capital expenditure and infrastructure investment are often expected to stimulate economic growth more strongly than consumption-based spending. However, their impact depends not only on expenditure size, but also on the quality of governance, allocation accuracy, and institutional capacity (Junarsin et al., 2023; Lashkhi, 2025; Zams et al., 2020).

The effectiveness of public spending becomes more complex in border regions. These areas are commonly characterized by geographic remoteness, uneven infrastructure, limited public service access, and socio-economic interaction across national boundaries. From a spatial perspective, public spending on transportation, communication, education, health, and productive sectors can strengthen regional connectivity and local welfare. Yet, if allocation is poorly targeted or implementation is weak, the benefits may concentrate in more developed areas and reinforce existing disparities (Faure, 2019; Fay & Straub, 2019; Rojas Rivera et al., 2025; Wichowska, 2021).

Existing studies increasingly emphasize that public spending should be evaluated in terms of efficiency, outcomes, and implementation quality rather than only nominal allocation. Recent evidence from various contexts highlights governance, fiscal transparency, institutional strength, and policy design as important determinants of expenditure effectiveness (Bajrami et al., 2025; Gurvich & Krasnopeevea, 2024; Tang et al., 2024; Yu et al., 2025). Similarly, fiscal decentralization may enable local governments to align spending with regional needs, but it can also create coordination problems and implementation gaps when local capacity is limited (Angin et al., 2021; Leppänen et al., 2017; Mathauer et al., 2016; Rousek, 2016).

The research gap addressed in this article is more specific than the general claim that border regions remain underexplored. Previous literature reviews have examined public expenditure and economic growth at a broad level (Castro, 2018; Nyasha & Odhiambo, 2019), budgeting for development outcomes and SDGs (Guariso et al., 2023), or sector-specific and spatial development issues. However, these reviews generally do not synthesize how budget allocation,

governance quality, institutional capacity, and border-specific characteristics interact to influence development outcomes. They also pay limited attention to spillover effects, inequality, and the gap between research evidence and policy implementation in border regions.

Therefore, this SLR differs from earlier reviews by focusing directly on border region development, integrating multiple expenditure sectors, and developing an analytical framework that connects budget allocation with development outcomes through governance and institutional mechanisms. The comparison below clarifies the position of this article relative to previous review-oriented studies and related border-region research.

Table 1. Comparative Positioning of This SLR against Previous Literature Reviews and Related Studies

Prior study / stream	Main focus	Spatial focus	Main limitation for this article	Position of this SLR
Castro (2018); Nyasha & Odhiambo (2019)	Public expenditure and economic growth	General / cross-country	Broad macroeconomic focus; limited attention to border-region dynamics	Focuses specifically on border regions and development outcomes
Guariso et al. (2023)	Public budgeting and SDG-related outcomes	General development policy	Strong quantitative emphasis but less focused on border governance and local implementation	Links budget allocation with governance, institutions, and local context
Rumbiak et al. (2021)	Sustainable development in Papua-Papua New Guinea border area	Specific border region	Important border case, but not a multi-sector SLR on public spending effectiveness	Builds a broader synthesis across sectors and countries
Sectoral expenditure studies	Education, health, agriculture, infrastructure, environment, or social protection	Mostly national/regional, not always border-specific	Findings remain fragmented across sectors	Integrates multiple sectors to identify consistent and context-dependent effects

Source: Data Processed, 2026

Based on this positioning, the study aims to answer three objectives. First, it examines how public expenditure allocation influences development outcomes in border regions. Second, it identifies governance and institutional factors that shape expenditure effectiveness. Third, it formulates research and policy implications for strengthening evidence-based public spending strategies in border development.

The contribution of this article is twofold. Theoretically, it integrates fragmented findings into a synthesis framework that explains the interaction between budget allocation, priority sectors, governance quality, institutional capacity, local context, and development outcomes. Practically, it provides policy directions for border regions, including Indonesia, where public expenditure must address not only infrastructure deficits but also local productive capacity, human capital, and cross-border development coordination.

2. Research Method

Research Questions and Review Design

This study uses a qualitative descriptive Systematic Literature Review (SLR) design. The SLR approach was selected because it enables transparent identification, screening, extraction, and synthesis of prior empirical and conceptual studies related to public spending and border-region development. The review is guided by PRISMA 2020 to strengthen replicability and reduce selection bias.

The review is guided by the following research questions: RQ1: How does the allocation of public expenditure influence development outcomes in border regions, and which sectors consistently demonstrate positive impacts on economic growth and social welfare? RQ2: What governance and institutional factors mediate or moderate the relationship between public spending and development effectiveness in border regions, particularly within the context of fiscal decentralization? RQ3: What research gaps persist in the study of public expenditure in border regions, and what policy recommendations can be derived to strengthen evidence-based policymaking?

Search Strategy, Boolean Keywords, and Data Sources

The literature search was conducted across Scopus, Web of Science, ScienceDirect, and Google Scholar. The initial search used the keyword public

spending and produced 8,533 records. The search was then narrowed by adding the keyword budget, resulting in 1,292 records after title and abstract screening. A further filter using the keyword region generated 115 records for retrieval and eligibility assessment. After applying inclusion and exclusion criteria, 27 articles were included in the final synthesis.

To improve transparency and replicability, the search strategy used keyword combinations that captured both fiscal expenditure and spatial development dimensions. The core Boolean logic is summarized in Table 2. The exact query syntax was adjusted to fit each database interface, but the conceptual combination remained consistent.

Table 2. Search Strings and Boolean Logic Used in the Review

Search stage	Keyword / Boolean combination	Purpose
Initial identification	"public spending"	To capture the broad literature on public expenditure
Screening I	"public spending" AND "budget"	To focus on studies that discuss expenditure allocation and budget policy
Screening II	"public spending" AND "budget" AND "region"	To narrow the results to regional development and spatial policy studies
Eligibility refinement	("public expenditure" OR "public spending") AND ("regional development" OR "border region" OR "regional inequality")	To assess relevance to border regions, development outcomes, and regional disparities

Source: Data Processed, 2026

Inclusion and Exclusion Criteria

The review period of 2016-April 2026 was selected to capture the most recent decade of public expenditure research and to reflect post-2015 development priorities, including the growing emphasis on sustainable development, fiscal decentralization, transparency, and evidence-based policy. Earlier influential studies were not used as part of the final reviewed dataset unless they provided theoretical or background support, because the aim of the SLR was to synthesize contemporary empirical and policy-oriented evidence.

The inclusion and exclusion criteria were applied to ensure that the final dataset was relevant, academically credible, and aligned with the research questions. The criteria are summarized in Table 3.

Table 3. Inclusion and Exclusion Criteria

Criterion	Included studies	Excluded studies
Publication type	Peer-reviewed journal articles, scholarly book chapters, or academic studies relevant to public expenditure and regional development	Non-academic sources, editorials, news articles, and duplicate records
Period	Studies published from 2016 to April 2026	Studies outside the period, except when cited only as theoretical background
Topic relevance	Studies discussing public expenditure, budget allocation, regional development, border regions, fiscal decentralization, governance, or development outcomes	Studies unrelated to public expenditure, regional development, or development outcomes
Spatial relevance	Studies with regional, spatial, border-region, or territorial development relevance	Studies with purely national macroeconomic focus and no regional or spatial dimension
Language and accessibility	Studies with accessible bibliographic information and sufficient methodological or findings detail	Records without sufficient information for extraction

Source: Data Processed, 2026

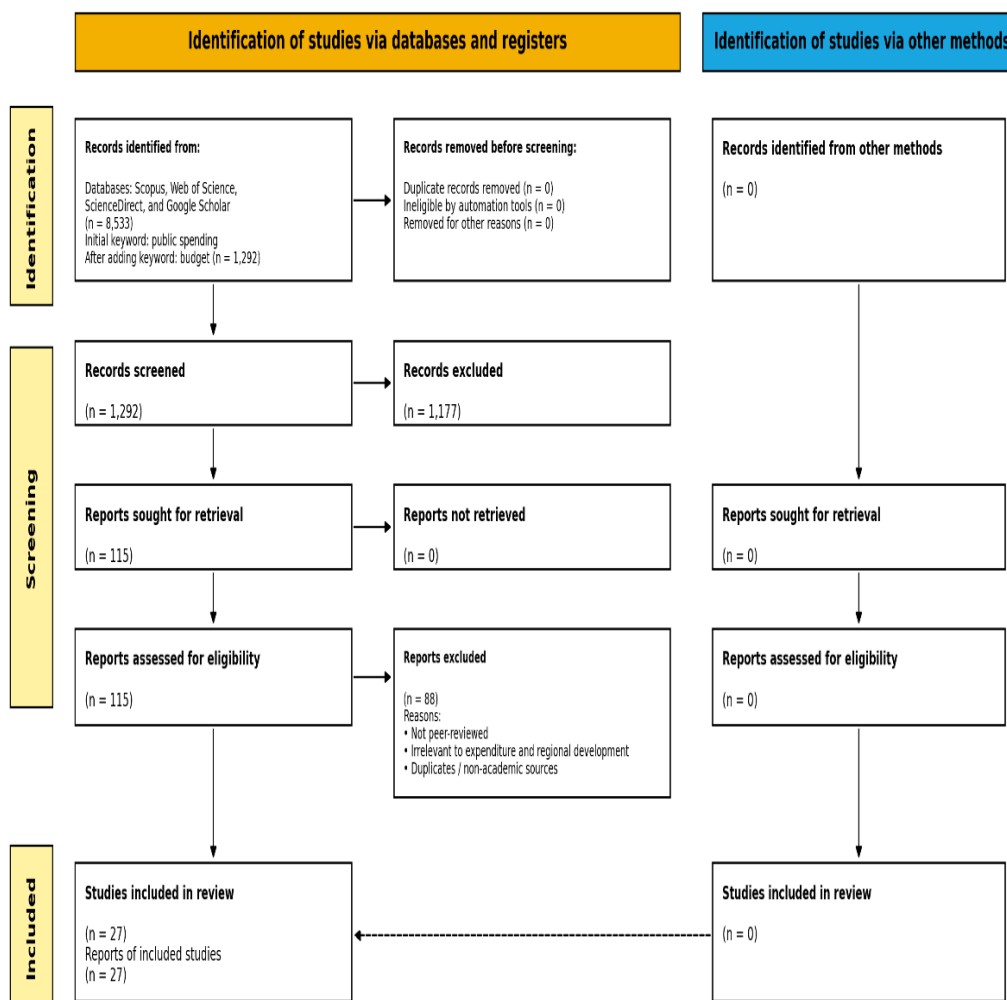
PRISMA Selection Process and Data Synthesis

The PRISMA process consisted of identification, screening, eligibility assessment, and inclusion. From 8,533 records initially identified, 1,292 records remained after adding the budget keyword and title-abstract screening. A further regional filter reduced the pool to 115 records. Of these, 88 were excluded because they were not peer-reviewed, irrelevant to public expenditure and regional development, duplicated, or non-academic. The final synthesis therefore included 27 studies.

Data were extracted based on author, year, journal, method, research focus, and contribution to synthesis. The analysis combined thematic analysis and narrative synthesis. Thematic analysis was used to identify recurring

expenditure sectors and governance factors, while narrative synthesis was used to explain relationships among budget allocation, implementation quality, institutional capacity, and development outcomes.

Figure 1. PRISMA Flow Diagram of Literature Selection
PRISMA Reporting: Effectiveness of Public Spending in Border Region Development



Generated based on PRISMA 2020.

Source: Author synthesis based on PRISMA 2020

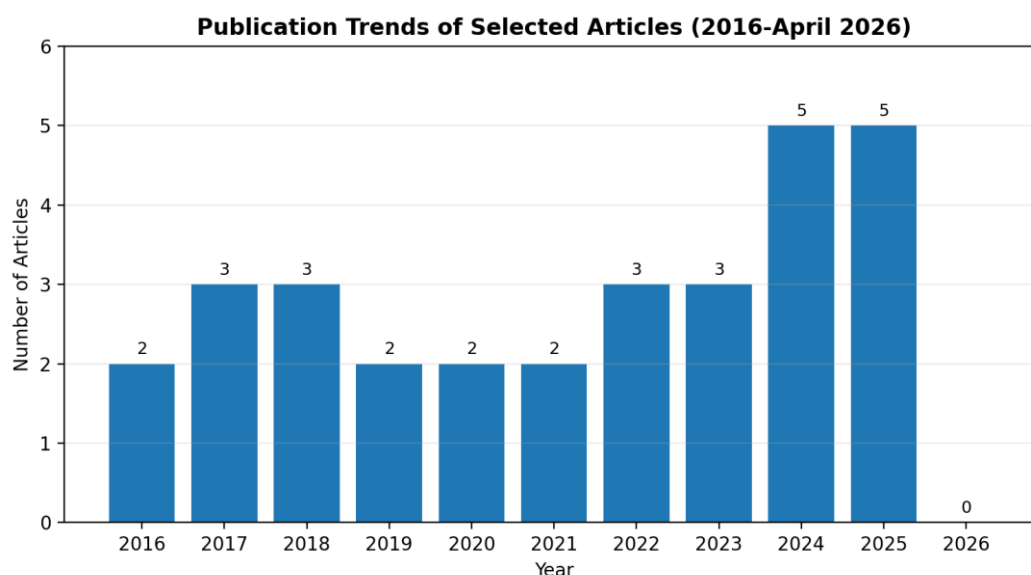
3. Result and Discussion

Publication Trends and Data Characteristics

The final dataset consists of 27 selected articles published between 2016 and April 2026. Publication activity remained relatively stable during 2016-2021, with two to three publications per year. A visible increase occurred in 2024 and 2025, when five publications were identified in each year. This trend suggests growing scholarly attention to public expenditure effectiveness, regional disparities, fiscal restructuring, and governance after the pandemic period.

Methodologically, the dataset is dominated by quantitative studies. Fifteen of the 27 studies employed quantitative approaches, including regression analysis, panel data, GMM, difference-in-differences, and other econometric techniques. The remaining studies used qualitative, descriptive-analytical, literature review, or mixed-method approaches. This pattern confirms that public expenditure research often relies on numerical indicators such as budget realization, GDP per capita, human development indicators, poverty rates, and carbon intensity.

Figure 2. Publication Trends of Selected Articles



Source: Author synthesis from 27 selected articles.

Table 4. Summary of Selected Publications Based on Research Focus

First author	Year	Publishing journal	Method	Research focus
Briamonte, L.	2022	Economia Agro-Alimentare	Descriptive	Agricultural expenditure/subsidies; social protection expenditure
Bajrami, R.	2025	Journal of Risk and Financial Management	Quantitative (GMM, Bayesian VAR, Random Forest)	Education expenditure
Scown, M.W.	2020	One Earth	Descriptive-analytical	Agricultural expenditure/subsidies; environmental/energy expenditure
Zubarevich, N.V.	2023	Regional Research of Russia	Quantitative (trend analysis)	Fiscal decentralization / regional expenditure
Doan Tuan Trinh, L.	2025	Knowledge and Performance Management	Quantitative (OLS, FEM, REM, GMM)	Education expenditure
Wichowska, A.	2021	Sustainability (Switzerland)	Quantitative (multiple linear regression)	Social protection expenditure
Goodier, S.	2017	Adoption and Impact of OER in the Global South	Qualitative (desk review)	Education expenditure
Gurvich, E.T.	2024	Voprosy Ekonomiki	Quantitative (quantile regression)	Social protection expenditure; fiscal decentralization
Seabrook, M.S.S.	2023	Canadian Public Policy	Quantitative (longitudinal)	Security/police expenditure
Yu, J.	2025	Applied Economics	Quantitative (difference-in-differences)	Environmental/energy expenditure
Zamirbekkyzy, M.	2024	Journal of Public and Nonprofit Affairs	Descriptive-analytical	Education expenditure; fiscal decentralization
Faure, A.	2019	BELGEO	Qualitative	Infrastructure expenditure
Fay, M.	2019	Journal of Infrastructure, Policy and Development	Quantitative (panel data)	Infrastructure expenditure
Peña Sánchez, A.R.	2022	Revista de Estudios Regionales	Quantitative (sigma	Health expenditure; social protection expenditure

First author	Year	Publishing journal	Method	Research focus
			convergence, Theil index)	
Tang, Z.	2024	Sustainability (Switzerland)	Quantitative (fixed effects)	Environmental/energy expenditure
Diniz, I.M.	2018	PloS ONE	Quantitative (multiple linear regression)	Health expenditure
Jung, H.	2024	Journal of the Asia Pacific Economy	Quantitative (IV estimation)	Social protection expenditure; fiscal decentralization
Leppänen, S.	2017	Environmental and Resource Economics	Quantitative (panel data)	Fiscal decentralization; environmental/energy expenditure
Rodríguez-Modroño, P.	2017	Revista de Estudios Regionales	Mixed methods	Social protection expenditure
Rousek, P.	2016	Nase More	Descriptive	Fiscal decentralization / regional expenditure
Rojas Rivera, P.C.	2025	Revista Venezolana de Gerencia	Mixed methods	Social protection expenditure
Amato, A.	2023	Economia Agro-Alimentare	Descriptive-analytical	Agricultural expenditure/subsidies; fiscal decentralization
Mathauer, I.	2016	International Journal for Equity in Health	Literature review	Fiscal decentralization / regional expenditure
Dinca, G.	2024	Sustainability (Switzerland)	Quantitative (OLS, GMM)	Agricultural expenditure/subsidies; environmental/energy expenditure
Angin, M.	2021	Economics and Politics	Quantitative (panel data)	Fiscal decentralization / regional expenditure
Piatti-Fuenfkirchen, M.	2018	Health Systems and Reform	Literature review	Health expenditure
Zvereva, T.V.	2022	Advances in Science, Technology and Innovation	Quantitative	Social protection expenditure

Source: Data Processed, 2026

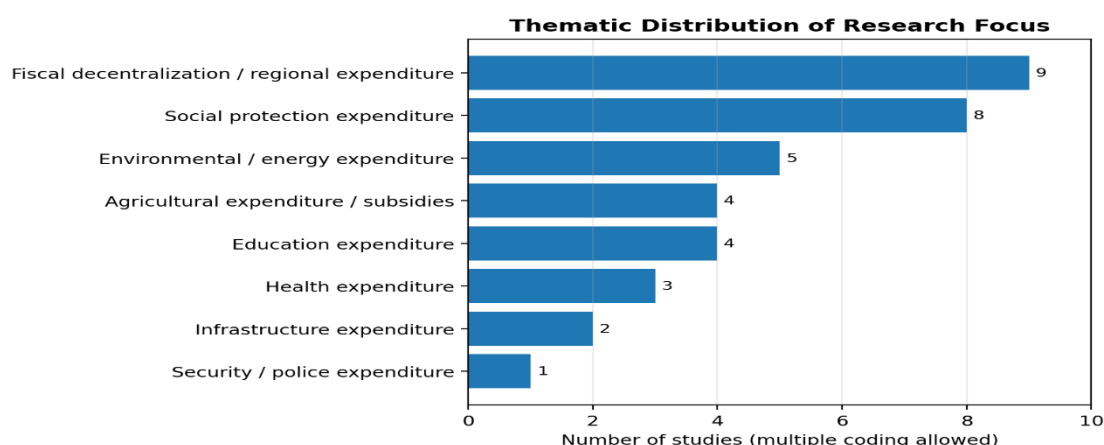
Thematic Distribution of Studies

The thematic distribution reveals two dominant clusters: fiscal decentralization and regional expenditure (9 studies), and social protection spending (8 studies). These clusters are followed by environmental or energy

expenditure (5 studies) (Dincă et al., 2024; Leppänen et al., 2017; Scown et al., 2020; Tang et al., 2024; Yu et al., 2025), agricultural expenditure or subsidies (4 studies) (Amato et al., 2023; Briamonte et al., 2022; Dincă et al., 2024; Scown et al., 2020), education expenditure (4 studies), (Bajrami et al., 2025; Doan Tuan Trinh, 2025; Goodier, 2017; Zamirbekkyzy et al., 2024), health expenditure (3 studies), (Diniz et al., 2018; Peña Sánchez et al., 2022; Piatti-Fünfkirchen et al., 2018), infrastructure expenditure (2 studies) (Faure, 2019; Fay & Straub, 2019), and security or police expenditure (1 study) (Seabrook et al., 2023). The dominance of fiscal decentralization themes reflects ongoing global debates – particularly in Eastern Europe, Latin America, and Central Asia – regarding the allocation of fiscal responsibilities across different levels of government. Studies such as Zubarevich and Safronov (2023) and Zamirbekkyzy et al. (2024) highlight the persistent complexity of these issues.

The dominance of fiscal decentralization reflects ongoing debates about how expenditure responsibility should be distributed across levels of government. Meanwhile, the strong presence of social protection studies indicates that welfare and inequality remain central concerns in regional development. However, agriculture and education emerge as particularly important for border regions because they directly improve local productive capacity and human capital, two factors that can generate more durable development outcomes than short-term consumption-oriented spending.

Figure 3. Thematic Distribution of Research Focus



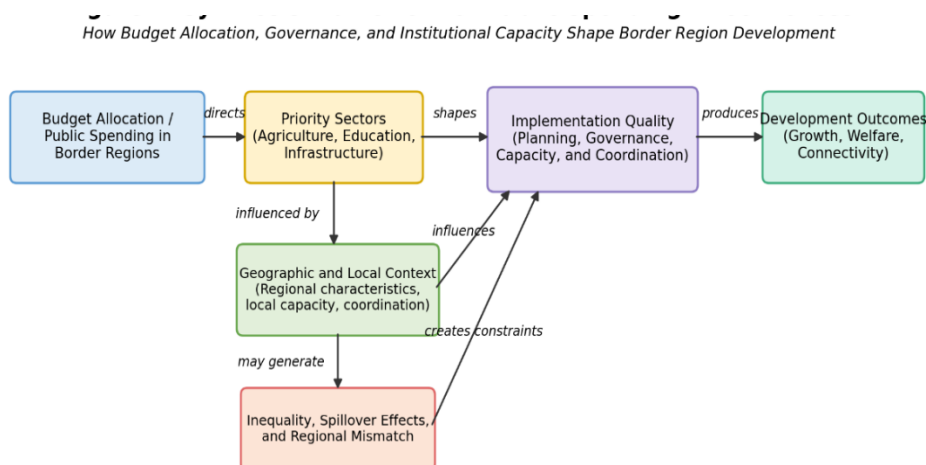
Source: Author synthesis; multiple coding allowed, 2026

Conceptual Framework: Public Spending Effectiveness in Border Regions

In response to the need for stronger analytical contribution, this review develops a synthesis framework that explains how public spending affects border-region development. The framework positions budget allocation as the starting point, but emphasizes that allocation alone does not guarantee development outcomes. Public spending becomes effective when it is directed to priority sectors, supported by implementation quality, and adapted to local geographic and institutional conditions.

The framework also shows that geographic and local context can influence implementation quality, while inequality, spillover effects, and regional mismatch may constrain the expected impact of public expenditure. In other words, public spending effectiveness is shaped by the interaction among sectoral targeting, governance quality, institutional capacity, coordination, and contextual fit.

Figure 4. Synthesis Framework of Public Spending Effectiveness



Core message: public spending effectiveness depends not only on budget size, but also on sectoral targeting, governance quality, local context, and implementation fit.

Source: Author synthesis based on reviewed literature

Direct Answers to the Research Questions

RQ1: Public expenditure allocation and development outcomes

The findings indicate that public expenditure allocation influences development outcomes in border regions through several channels, particularly economic growth, social welfare improvement, and regional connectivity. Public spending becomes more effective when it is directed

toward productive and basic service sectors that support local economic activity and improve human development. Investments in agriculture, education, infrastructure, healthcare, and local economic development are therefore central to strengthening the development capacity of border regions. Previous studies show that public expenditure can contribute to economic growth and welfare when it improves labor productivity, supports employment creation, and expands access to essential public services (Castro, 2018; Iyoha & Oyerinde, 2010; Nyasha & Odhiambo, 2019).

The reviewed literature suggests that agriculture and education are among the sectors that most consistently demonstrate positive impacts on development outcomes. Agricultural spending contributes to local productivity, food security, and rural economic activity, particularly in regions where communities depend on primary sectors for livelihoods (Briamonte et al., 2022; Amato et al., 2023; Dincă et al., 2024; Scown et al., 2020). Education expenditure also plays an important role because it improves human capital, labor quality, and long-term development capacity. Studies by Goodier (2017), Doan Tuan Trinh (2025), Bajrami et al. (2025), and Zamirbekkyzy et al. (2024) indicate that education-related public spending is associated with improvements in human development, economic productivity, and institutional readiness for regional development.

Infrastructure spending also contributes to development outcomes by improving connectivity, mobility, and access to markets. In border regions, transportation and communication infrastructure are particularly important because they reduce spatial isolation and support cross-border economic interaction. However, the effectiveness of infrastructure expenditure is not always evenly distributed. Faure (2019) and Fay and Straub (2019) show that infrastructure investment may improve connectivity and economic access, but its benefits can be concentrated in more developed or better-connected areas. This means that infrastructure spending should be supported by targeted planning so that border regions do not merely become transit areas but can capture direct economic benefits from improved connectivity.

Public expenditure also affects social welfare through spending on healthcare and social protection. Health expenditure can improve access to basic services, reduce vulnerability, and support human development outcomes, particularly in disadvantaged regions (Diniz et al., 2018; Piatti-Fünfkirchen et al., 2018; Peña Sánchez et al., 2022). Social protection spending

is also relevant for reducing inequality and protecting vulnerable communities, although its impact may vary depending on targeting accuracy and institutional effectiveness (Wichowska, 2021; Rojas Rivera et al., 2025; Zvereva et al., 2022). These findings indicate that social spending can support welfare improvement, but it requires strong implementation mechanisms to ensure that benefits reach the intended communities.

Overall, RQ1 is answered by showing that public expenditure allocation contributes to border region development when spending is directed toward sectors that generate productive, social, and connectivity-related outcomes. Agriculture and education appear to provide more consistent development benefits, while infrastructure, healthcare, and social protection also contribute but require stronger targeting and coordination. However, the effect of public expenditure remains uneven because development outcomes are shaped by local context, regional disparities, spillover effects, and the quality of policy implementation. Spillover effects may cause the benefits of public spending to extend beyond targeted border areas, reducing the direct impact on local communities if interregional coordination is weak (Angin et al., 2021). Therefore, the effectiveness of public expenditure depends not only on the amount of budget allocated, but also on sectoral targeting, local needs alignment, and the ability of institutions to translate spending into measurable development outcomes.

RQ2: Governance and institutional factors shaping effectiveness

The effectiveness of public expenditure in border regions is strongly shaped by governance quality, institutional capacity, fiscal transparency, and coordination across levels of government. The reviewed studies indicate that public spending does not automatically generate positive development outcomes when it is not supported by effective planning, monitoring, and institutional implementation. This finding is consistent with studies showing that governance quality and institutional strength determine whether fiscal allocation can be transformed into measurable regional development benefits (Tang et al., 2024; Yu et al., 2025). Similarly, Angin et al. (2021) and Leppänen et al. (2017) emphasize that coordination between central and local governments is essential to ensure that fiscal decentralization supports regional needs rather than creating administrative fragmentation.

Institutional capacity also appears as a key factor influencing expenditure effectiveness. In regions with weak administrative capacity,

limited human resources, and low budget absorption, public spending may fail to reach intended development targets. This condition is particularly relevant in border regions, where geographical remoteness, limited infrastructure, and socio-economic diversity complicate policy implementation. Gurvich and Krasnopeevea (2024) and Zamirbekkyzy et al. (2024) show that regional expenditure composition is influenced by institutional capacity and interbudgetary relations, while Zubarevich and Safronov (2023) demonstrate that persistent fiscal gaps across regions can reduce the equalizing function of public spending. Therefore, the effectiveness of public expenditure depends not only on the amount of budget allocated but also on the institutional ability to plan, manage, and evaluate spending.

Fiscal decentralization provides opportunities for local governments to align expenditure with local priorities, but its impact depends on transparency, accountability, and policy coherence. Rousek (2016) and Mathauer et al. (2016) indicate that fiscal transfers can support sectoral development, but weak integration between national and local planning may limit their effectiveness. In this context, transparency in budget management becomes important because it strengthens accountability and reduces the risk of inefficient allocation. Studies by Yu et al. (2025) and Tang et al. (2024) further show that transparent revenue and expenditure management can improve policy outcomes, particularly in areas related to environmental and regional development. Thus, governance and institutional factors function as mediating and moderating mechanisms that determine whether public expenditure contributes to inclusive and sustainable border development.

Overall, RQ2 is answered by showing that governance quality, institutional capacity, fiscal transparency, intergovernmental coordination, and decentralization arrangements are central factors shaping the effectiveness of public spending. These factors mediate the relationship between budget allocation and development outcomes by determining how resources are translated into programs, while also moderating the strength of expenditure impacts across different regional contexts. In border regions, where institutional and geographical constraints are more complex, strengthening governance mechanisms is essential to ensure that public spending produces equitable and sustainable development outcomes.

RQ3: Research gaps and policy recommendations

The reviewed literature reveals several important research gaps in the study of public expenditure and border region development. First, most existing studies remain fragmented and tend to focus on single sectors, such as education, health, infrastructure, social protection, or environmental expenditure, rather than examining public spending as an integrated development mechanism. Earlier reviews on public expenditure and economic growth provide broad insights into fiscal impacts, but they do not specifically address the multidimensional challenges of border regions (Castro, 2018; Nyasha & Odhiambo, 2019). Similarly, studies on budgeting for development goals emphasize the importance of expenditure allocation, but they often focus on national or sectoral policy contexts rather than border-specific dynamics (Guariso et al., 2023). This shows that the literature still lacks a comprehensive synthesis connecting budget allocation, governance quality, institutional capacity, and development outcomes in border regions.

Second, the methodological orientation of existing studies is still dominated by quantitative approaches. Quantitative studies are useful for measuring statistical relationships between public spending and development indicators, such as economic growth, poverty, inequality, or human development. However, they are often less capable of explaining why similar expenditure policies produce different outcomes across regions. This limitation is important because border regions are characterized by complex local dynamics, including weak institutional capacity, geographical isolation, cross-border interaction, and uneven infrastructure access. Qualitative and mixed-method studies such as Goodier (2017) and Faure (2019) demonstrate the value of contextual analysis by showing how financing mechanisms and infrastructure coordination may diverge from formal policy design. Therefore, future research should combine quantitative measurement with qualitative investigation to better explain implementation processes and local institutional realities.

Third, there is still limited research that directly links public expenditure effectiveness with evidence-based policymaking in border areas. Several studies indicate that fiscal transfers and regional expenditure can reduce inequality only when allocation strategies are well targeted and institutionally supported (Rojas Rivera et al., 2025; Zubarevich & Safronov, 2023; Zvereva et al., 2022). However, many studies do not sufficiently explain

how research findings are translated into policy instruments. This gap is particularly relevant for Indonesia's border regions, where development challenges require stronger integration between national planning, local needs, and cross-border economic opportunities. Studies on fiscal decentralization and regional expenditure suggest that policy effectiveness requires better coordination, transparency, and adaptive fiscal design (Angin et al., 2021; Leppänen et al., 2017; Rousek, 2016).

Based on these gaps, several policy recommendations can be proposed. First, governments should strengthen the integration between central and local fiscal planning through data-driven and outcome-based budgeting systems. Second, public expenditure should prioritize sectors that consistently show positive development impacts, particularly education and agriculture, while still considering infrastructure, healthcare, and local economic development as supporting sectors. Third, fiscal transfer formulas should be made more adaptive to the unique characteristics of border regions, including geographical remoteness, infrastructure deficits, poverty levels, and cross-border connectivity. Fourth, performance evaluation should shift from budget absorption to outcome-based indicators, such as improvements in welfare, productivity, connectivity, and regional resilience. Finally, stronger research-policy linkages are needed so that academic findings can inform practical fiscal strategies and support evidence-based policymaking in border development.

Thus, RQ3 is answered by identifying three main gaps: the limited integration of sectoral studies, the dominance of quantitative methods, and the weak connection between academic evidence and policy implementation. These gaps indicate the need for future studies that adopt integrated, context-sensitive, and mixed-method approaches. From a policy perspective, public spending in border regions should be supported by better institutional coordination, adaptive fiscal transfers, stronger monitoring systems, and evidence-based planning to ensure that budget allocation contributes to equitable and sustainable regional development.

Implications for Border Region Development in Indonesia

The findings of this systematic literature review have important implications for border region development in Indonesia. Indonesian border regions such as Kalimantan Utara, Papua, and Nusa Tenggara Timur are characterized by geographical remoteness, infrastructure gaps, limited access to basic services, and strong dependence on central government transfers.

These characteristics make public expenditure an important fiscal instrument for reducing regional disparities and improving development outcomes. However, the reviewed literature suggests that the effectiveness of public spending depends not only on the amount of budget allocated, but also on sectoral targeting, governance quality, institutional capacity, and the alignment between central planning and local needs (Angin et al., 2021; Leppänen et al., 2017; Zubarevich & Safronov, 2023).

In the Indonesian border context, agriculture and education should be prioritized because these sectors are closely related to local economic productivity and human development. Agricultural expenditure is relevant for border communities whose livelihoods often depend on farming, fisheries, and other primary economic activities. Previous studies indicate that agricultural spending can strengthen local productivity and rural development when it is supported by appropriate targeting and institutional coordination (Briamonte et al., 2022; Amato et al., 2023; Dincă et al., 2024). Education expenditure is also crucial because border regions often face limited access to schools, teacher shortages, and lower human capital capacity. Evidence from the reviewed studies shows that education spending contributes to human development and long-term economic growth by improving labor quality and regional competitiveness (Goodier, 2017; Doan Tuan Trinh, 2025; Bajrami et al., 2025; Zamirbekkyzy et al., 2024).

Infrastructure investment remains essential for Indonesian border regions, particularly to improve connectivity, market access, and cross-border economic interaction. In areas such as Kalimantan Utara, Papua, and Nusa Tenggara Timur, transportation and communication infrastructure can reduce spatial isolation and support the movement of goods, people, and public services. However, infrastructure spending should be carefully designed so that benefits are not captured only by more developed or transit-oriented areas. Studies by Faure (2019) and Fay and Straub (2019) show that infrastructure investment can improve connectivity, but its benefits may be uneven when planning does not sufficiently consider territorial disparities and local economic capacity. Therefore, infrastructure policy in Indonesian border regions should be integrated with local economic development strategies, including agriculture, small-scale trade, tourism, and cross-border market development.

The findings also imply that governance and institutional capacity must be strengthened to improve the effectiveness of public expenditure in border areas. Fiscal instruments such as APBN, APBD, Village Funds, and Special Allocation Funds provide important financing mechanisms for regional development, but their impact depends on coordination, transparency, budget absorption capacity, and accountability. Weak institutional capacity, limited human resources, and fragmented coordination between national and local governments can reduce the effectiveness of public spending (Mathauer et al., 2016; Rousek, 2016; Gurvich & Krasnopeevea, 2024). In this regard, Indonesian border development requires stronger integration between central and local fiscal planning, improved monitoring systems, and clearer outcome-based indicators.

Furthermore, public expenditure policy in Indonesian border regions should shift from an absorption-oriented approach to an outcome-based approach. Budget performance should not only be measured by how much funding is spent, but also by whether the expenditure improves welfare, reduces inequality, strengthens connectivity, and supports sustainable local economic growth. The reviewed literature shows that public spending may produce spillover effects and uneven outcomes when regional coordination is weak or when programs are not aligned with local needs (Angin et al., 2021; Rojas Rivera et al., 2025; Zvereva et al., 2022). Therefore, border development policies should apply more adaptive fiscal transfer formulas that consider geographical remoteness, infrastructure deficits, poverty levels, human development gaps, and cross-border economic potential.

Overall, the implication for Indonesia is that public expenditure in border regions should be designed as an integrated development strategy rather than as a sectoral budget allocation process. Education and agriculture should be strengthened as priority sectors, infrastructure should be linked to local economic development, and governance mechanisms should ensure transparency, accountability, and coordination across levels of government. By applying evidence-based and context-sensitive fiscal planning, Indonesian border regions can move beyond their peripheral position and become strategic areas for inclusive and sustainable development.

Policy Implications

The findings of this SLR provide several concrete directions for policy development:

1. Strengthen integration between central and local fiscal planning through real-time data systems and shared development indicators.
2. Prioritize education and agricultural spending as protected budget sectors in border regions because they consistently support human capital and local productive capacity.
3. Develop adaptive fiscal transfer formulas that reflect geographic remoteness, infrastructure gaps, service-delivery costs, and local institutional capacity.
4. Shift performance evaluation from budget absorption to outcome-based indicators, including welfare, connectivity, local productivity, and poverty reduction.
5. Enhance cross-border cooperation in economic planning, infrastructure development, border trade facilitation, and local market integration.
6. Institutionalize evidence-based policymaking through stronger linkages among universities, local governments, planning agencies, and border management institutions.

Synthesis and Future Directions

Overall, the literature demonstrates that public expenditure contributes to economic growth, welfare improvement, and regional development when it is supported by appropriate sectoral targeting, strong governance, institutional capacity, and alignment with local needs. However, the impacts remain uneven because border regions face specific structural challenges, including geographical remoteness, limited infrastructure, weak coordination, and spillover effects.

Future research should address methodological imbalances by integrating quantitative analysis with qualitative insights, particularly in border regions where local institutional and socio-economic dynamics are critical. Greater attention should also be given to how academic evidence can be translated into practical fiscal policy frameworks. In this regard, future studies should develop more context-sensitive models that connect budget allocation, governance quality, institutional capacity, and measurable development outcomes.

4. Conclusion

Based on the analysis, public expenditure plays a strategic role in promoting border region development. Investments in infrastructure, basic services, education, agriculture, and local economic development contribute to economic growth, community welfare, and regional connectivity. However, the effectiveness of public expenditure remains constrained by unequal budget allocation, limited institutional capacity, weak governance, and poor coordination between levels of government.

The findings show that the impact of public spending is uneven and highly dependent on local context, types of intervention, and the quality of policy implementation. Agriculture and education appear to provide more consistent development benefits, while infrastructure, healthcare, and social protection require stronger targeting and coordination to produce more equitable outcomes. Spillover effects, mismatches between planning and regional needs, and geographical and socio-cultural constraints also influence development outcomes.

This SLR contributes by developing a synthesis framework that connects budget allocation, priority sectors, implementation quality, local context, inequality, spillover effects, and development outcomes. For Indonesia, the findings imply that border-region development should be more place-based, evidence-driven, and outcome-oriented. Future research should combine quantitative and qualitative approaches to capture both measurable development effects and the local processes that determine whether public expenditure becomes effective, equitable, and sustainable.

5. References

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