

# Collaborative Border Management for Basic Infrastructure Development in Local Government Border Areas

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## ABSTRACT

*A country's territorial integrity is crucial for maintaining sovereignty and must be protected through defense, security, and national unity. Indonesia's independence was achieved through great sacrifices, making it essential to address threats such as inequality, injustice, and weakening national values. This research aims to analyze collaborative border management to accelerate the development of basic infrastructure in the North Borneo border area with Malaysia. This research employs a qualitative research design with a post-positivism approach to explore social phenomena in depth, develop theoretical interpretations, and answer the research questions. Collaborative border management has accelerated basic infrastructure development in Indonesia-Malaysia border areas, particularly in North Borneo. The government and private sector work together to improve road networks, inter-island transportation, water reservoirs, and telecommunications access. Providing subsidies to private entities can ensure affordable transportation services for residents while encouraging infrastructure expansion. Cross-border collaboration is essential for efficient development, enhancing accessibility, and improving the quality of life for border communities.*

**Keywords:** *Basic Infrastructure Development, Collaborative Border, Local Government Border Areas, Post-Positivism, Thematic Analysis.*

## ABSTRAK

*Keutuhan wilayah suatu negara sangat penting untuk menjaga kedaulatan dan harus dilindungi melalui pertahanan, keamanan, dan persatuan nasional. Kemerdekaan Indonesia harus dicapai melalui pengorbanan yang besar, sehingga penting untuk mengatasi ancaman seperti ketimpangan, ketidakadilan, dan melemahnya nilai-nilai nasional. Penelitian ini bertujuan untuk menganalisis pengelolaan perbatasan secara kolaboratif untuk mempercepat pembangunan infrastruktur dasar di wilayah perbatasan Kalimantan Utara dengan Malaysia. Penelitian ini menggunakan desain penelitian kualitatif dengan pendekatan post-positivisme untuk mengeksplorasi fenomena sosial secara mendalam, mengembangkan interpretasi teoritis, dan menjawab pertanyaan penelitian. Pengelolaan perbatasan secara kolaboratif telah mempercepat pembangunan infrastruktur dasar di wilayah perbatasan Indonesia-Malaysia, khususnya di*

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*Kalimantan Utara. Pemerintah dan sektor swasta bekerja sama untuk meningkatkan jaringan jalan, transportasi antar pulau, waduk, dan akses telekomunikasi. Memberikan subsidi kepada badan usaha swasta dapat memastikan layanan transportasi yang terjangkau bagi penduduk sekaligus mendorong perluasan infrastruktur. Kolaborasi lintas batas sangat penting untuk pembangunan yang efisien, meningkatkan aksesibilitas, dan meningkatkan kualitas hidup masyarakat perbatasan.*

**Kata Kunci:** *Pembangunan Infrastruktur Dasar, Perbatasan Kolaboratif, Pemerintah Daerah Wilayah Perbatasan, Post-Positivisme, Analisis Tematik.*

## INTRODUCTION

The territory of a state is one of the foundational elements of its sovereignty, alongside population, governance, and international recognition. Consequently, the protection and effective management of national territory, especially border areas, is essential to maintaining sovereignty (Martins et al., 2021). Challenges such as regional inequality and a declining understanding of national values must be urgently addressed to prevent fragmentation (Purnomo et al., 2024). Border areas are particularly vulnerable to threats such as terrorism, smuggling, and illicit trade, making it essential to fulfill basic needs and foster a strong sense of nationalism among border communities (Sembiring et al., 2024). In response, border management strategies must adopt an outward-looking perspective to ensure integration with national interests and global engagement (Firdaus, 2022; Kumar et al., 2024; Maharani & Syah, 2024).

Since the enactment of Law No. 43 of 2008, Indonesia has made progress in managing its borders. The National Border Management Agency (*Badan Nasional Pengelola Perbatasan*/BNPP) now coordinates border policies that combine security, economic development, and sustainability (Laine, 2021). One of the key areas of focus is North Kalimantan Province, which shares a land border with Malaysia. Despite its strategic location, the region suffers from significant poverty, underdeveloped infrastructure, poor accessibility, and limited socio-economic services. In Nunukan Regency, these conditions result in low life expectancy and restricted access to health services (Iijima et al., 2021; BPS, 2024).

The persistence of poverty, poor educational attainment, and minimal healthcare facilities severely impacts the quality of human resources. Most residents attain only elementary education (Madubun, 2024), limiting their capacity to engage in economic development and to optimize the use of local natural resources. This low competitiveness is particularly concerning given the proximity to Malaysia, where employment opportunities may draw skilled labor. Yet, many border areas in Indonesia are rich in untapped natural resources (forests, plantations, fisheries, and minerals) which, if developed responsibly, could significantly boost regional economies (Hannani & Ananda, 2024). Unfortunately, a lack of policy focus and inadequate funding have led to mismanagement of these resources. Illegal activities such as large-scale logging in Kalimantan and sea sand mining in the Riau Islands have caused environmental degradation (Xiao et al., 2023). To prevent long-term damage, natural resource management must prioritize sustainability, ensuring that environmental preservation aligns with development goals (Vasile, 2022).

Addressing border challenges requires multi-stakeholder involvement. While the central and local governments bear primary responsibility, collaboration with private enterprises, community organizations, and universities is vital. One effective framework is Collaborative Border Management (CBM), which integrates the roles of policy, process, people, infrastructure, and facilities in border governance (Doyle, 2010). This approach aligns with Indonesia's multi-tiered governance system, where central and regional authorities, along with non-state actors, play key roles in development. CBM encourages synergy between sectors to accelerate infrastructure development and improve service

delivery. This study aims to examine how CBM can be effectively implemented in North Kalimantan Province to improve basic infrastructure.

## **LITERATURE REVIEW**

### **Border Area**

Guo (2015) categorizes boundaries into traditional and new forms. Traditional boundaries are physical lines dividing states or regions, while the new perspective includes four types: natural, institutional (formal and informal) (Gërkhani & Cichocki, 2023), functional (Monaco et al., 2023), and mixed boundaries (Więckowski & Timothy, 2021). This broadened understanding highlights that boundaries are not only geographical but also encompass political, economic, and social dimensions.

Moodie (1963) differentiates between “boundaries” as territorial limits and “frontiers” as zones of influence. Similarly, Weigert (1957) introduced the idea of “boundary zones,” areas with overlapping control resembling frontiers. Kristof (1959) viewed boundaries as centripetal (pulling inward) while frontiers were centrifugal, allowing greater social and cultural exchange. Dikshit (1999) emphasized that frontier areas are especially vulnerable to external threats that can destabilize a state.

Martinez (1994) classified border areas into four types: alienated, coexistent (Ferreira et al., 2025), interdependent (Janparvar et al., 2021), and integrated borderlands (Jakubowski et al., 2022). Indonesia’s borders exhibit all four, but coexistent areas require closer attention due to their potential for conflict. To foster development, the integrated borderland approach (focused on shared growth and cooperation) should be prioritized. Hartshorne (1931) identified four functional boundary types: antecedent (García-Sanabria et al., 2021), subsequent (Brumann & Gfeller, 2022), superimposed (De Luca Picione et al., 2025), and relic (Więckowski & Timothy, 2021). These classifications highlight the historical, political, and colonial influences in boundary formation and remain useful for understanding regional tensions and integration dynamics.

### **Collaborative Governance**

Collaborative governance refers to inclusive decision-making processes involving state and non-state actors. Innes and Booher (2003) emphasized that collaboration bridges governments and stakeholders through shared dialogue. The UN ESCAP defines governance as the decision-making and implementation process, and Emerson et al. (2012) defined collaborative governance as a power-sharing mechanism to produce sustainable public solutions. It involves crossing boundaries (sectoral, institutional, and jurisdictional) uniting the public, private, and civil society sectors to solve collective problems.

The key components are cooperation, mutual trust, and pooling of authority, expertise, and resources. The collaborative process is characterized by inclusive participation, equal voice, and consensus-based strategies. McDougall et al. (2013) underlined three vital features: deliberate decision-making based on shared learning, inclusivity and equity among actors, and efforts to balance strategic partnerships while managing conflicts effectively.

### **Collaborative Border Management**

Doyle (2010) introduced Collaborative Border Management (CBM) as a framework integrating policy, process, people, technology infrastructure, and physical facilities to improve border governance. The approach shifts from a control-based to a trust-based model, encouraging efficiency, regulatory cooperation, and enhanced service delivery. It promotes coordination between national and international stakeholders in managing border security and development.

CBM fosters cooperation at three levels: intra-service (within a single agency), inter-agency (among national institutions), and international (between countries). However, Kieck (2010) highlighted persistent challenges such as institutional resistance, distrust,

cultural differences, and resource limitations. Despite this, CBM remains vital for enhancing border governance through strategic collaboration and integrated infrastructure development, particularly in sensitive and complex regions.

## **RESEARCH METHOD**

This research adopts a qualitative method within a post-positivist framework. The post-positivist perspective holds that research is grounded in pre-existing theories, which are then explored, refined, or reinterpreted throughout the research process. Researchers begin with a theoretical foundation to investigate complex social realities but remain receptive to new insights that may enhance or challenge the initial assumptions. Rather than viewing truth as fixed and absolute, the post-positivist approach considers it something that can be approximated through critical and systematic interpretation of empirical evidence. This makes the approach particularly suitable for analyzing social phenomena that are layered with meaning and shaped by context. It allows researchers to engage deeply with the subject matter, interpret findings thoughtfully, and acknowledge the influence of their own perspectives while striving for objectivity. Ultimately, this approach supports a more nuanced and reflective understanding of dynamic social realities, making it highly appropriate for studies involving human behavior, culture, or societal change.

The use of qualitative design in this study is based on the researcher's desire to explore in depth the focus of the research, especially because the issues raised are related to complex social phenomena and require contextual understanding. This is in line with Leavy's (2022) opinion which states that qualitative design is used because researchers want to explore, investigate, and study social phenomena in depth in order to reveal the meaning that is considered to come from activities, situations, events, or artifacts, as well as to build a deep understanding of various dimensions of social life. In other words, this approach allows researchers to capture subjective experiences, views, and perspectives of participants in their real contexts. In addition, the qualitative approach is also considered very appropriate for use in answering the formulation of the problem proposed by the researcher, because this approach provides room for flexibility in data collection and interpretation of narrative and holistic results, which can ultimately provide a richer and more comprehensive picture of the problems studied.

## **RESULTS**

### **Policy**

Indonesia and Malaysia have engaged in numerous international agreements to enhance bilateral cooperation, particularly in territorial affirmation, security, border development, and service improvements. These agreements span legal, economic, social, transportation, and technological dimensions. Notable treaties include the Continental Boundary Agreement (1969), ratified by Law No. 1 of 1973, and the Sea Boundary Agreement (1970), ratified by Law No. 2 of 1971. An extradition agreement was concluded in 1974 (Law No. 9 of 1974), followed by a memorandum for the Exclusive Economic Zone (1982) and security cooperation (1984). Additional agreements include the double taxation avoidance treaty (1991) and the 2004 migrant worker protection deal.

In defense and border cooperation, the Treaty on the Delimitation of the Continental Shelf Boundary (2010) and the Defense Cooperation Agreement (2021) are particularly significant. Socioeconomic cooperation has developed since the 1967 Sosek Malindo initiative, fostering trade, infrastructure, and human resource collaboration. The Border Trade Agreement (1970) and Border Crossing Agreement (2006) are central to cross-border commerce and mobility. Tourism cooperation was strengthened through a 2019 MoU, aiming to develop joint destinations. Technological cooperation includes the MoU between Indonesia's Ministry of Communication and Information and Malaysia's Ministry of Communication and Multimedia, focusing on BTS tower development, frequency allocation, and digital services.

In transportation, the 1984 Border Crossing Agreement and subsequent updates support growing connectivity, complemented by the Border Transportation MoU (2005), land goods transport agreement (2009), and PLBN development through Presidential Decree No. 12 of 2014. Maritime cooperation is governed by the 2017 updated Maritime Transport Agreement, while air transport continues to be refined. These efforts reflect a consistent bilateral commitment to fostering productive and stable border relations.

### **Process**

Based on field data, the North Borneo Provincial Government and the Nunukan Regency Government have shown strong commitment to supporting central government directives for border development. A key success was the construction of the Sei Nyamuk PLBN on Sebatik Island, which involved multi-level collaboration among agencies like the Ministry of Home Affairs, Public Works, Finance, and Law and Human Rights.

National roads across Sebatik Island, under central authority, have been completed and are in good condition. However, local-level infrastructure managed by villages and districts faces difficulties due to limited budgets, as confirmed by regional officials. In transportation, private operators and community groups provide sea transport services, but the costs remain high. For example, the Tarakan–Nunukan route costs IDR 280,000 for a 2.5-hour journey, more than equivalent land-based alternatives, indicating a need for government subsidies.

In telecommunications, the Nunukan government has submitted proposals to BAKTI to expand coverage in blank spot areas. BAKTI is responsible for improving digital infrastructure, managing USO funds, and promoting digital literacy. Despite tower development, technical constraints persist, particularly bandwidth limitations (only 50 Mbps), which restrict access for both the public and government. This underscores the need for better service maintenance and infrastructure optimization to support regional development.

### **People**

Civil servant performance is central to bureaucratic success in border areas. However, limited staffing and skill gaps impede development. One major challenge is the shortage of professional talent in specialized sectors like telecommunications. Border areas lack sufficient telecommunications graduates and training institutions. Recruiting experts from outside is difficult due to remoteness and insufficient incentives. High turnover also persists due to poor working conditions, limiting the retention of qualified professionals.

In addition, a technological skills mismatch exists, as local workers often lack the expertise to operate modern systems. Cultural and language differences between incoming experts and local communities further reduce productivity. Opportunities for advancement in these areas are also limited compared to urban centers. Moreover, civil servants face heavy workloads managing large territories, increasing the risk of burnout and safety concerns. A lack of mentoring, poor access to best practices, and rapid technological change compound these challenges, making it difficult to retain and train capable personnel (Rich, 2023).

### **Technology Infrastructure**

The development of digital infrastructure in border regions faces unique obstacles due to their isolation, low population density, and difficult access (Ayuningtyas et al., 2024). However, improved cellular and broadband access reduces isolation and improves information flow, increasing national integration. Technology enables better border surveillance with the use of cameras, sensors, and drones, while also supporting early warning systems and real-time coordination among security units.

Digital infrastructure also strengthens e-government services by enabling online access, transparency, and public participation. In the transportation sector, Intelligent Transportation Systems (ITS) provide real-time updates, e-ticketing, and collision

warnings to improve travel safety and efficiency. For logistics, digital tools offer route optimization and real-time cargo tracking, enhancing delivery and cost effectiveness.

### Facility

Despite the development of national roads and other basic infrastructure, supporting facilities in border areas remain underdeveloped. Many newly built roads are not fully utilized because they are incomplete or located far from settlements (Wendt et al., 2021). Road construction is further hindered by the need to import equipment from outside the island. Several challenges are tied to geography, such as remote terrain, extreme weather, and poor transport access for materials and equipment. Border areas also face resource limitations including labor shortages, unreliable electricity, limited water access, and weak communication infrastructure. Logistics issues are prevalent due to high transportation costs and insufficient storage and warehousing. Security concerns arise from risks of conflict and equipment theft, while maintenance is constrained by a lack of service providers and access to spare parts.

Administrative burdens such as complex licensing and poor coordination among agencies create additional delays. Funding shortages and risk-averse investors make financing difficult, while social resistance and cultural differences hinder smooth implementation. Lastly, unpredictable weather patterns, including extended rainy or dry seasons, disrupt construction timelines.

### Thematic Analysis Based on Five Pillars of Governance

To gain a more systematic understanding of the development conditions in border areas, this analysis groups the main findings into five main pillars of governance, namely policy, implementation process, human resources, technology utilization, and physical facilities. These five aspects provide a comprehensive picture of the dynamics and challenges faced, as well as the extent to which cross-sector collaboration has been implemented effectively. The summary in the following Table 1 presents the main results of each aspect along with important notes that can be the basis for formulating further intervention strategies.

Table 1. Five Pillars of Governance

Aspect	Key Results	Important Notes
Policy	The policy has regulated the division of authority between the center and regions.	Emphasis on central authority for border area management.
Process	Most of the central programs have been supported by local governments.	The construction of the Sei Nyamuk PLBN was successful thanks to cross-institutional collaboration.
People	ASN human resources in border areas are still limited and poorly trained.	Technical training and an effective rotation system are needed.
Technology	Utilization of technological infrastructure supports connectivity, security, and service efficiency.	However, there are still many blank spot areas and limited bandwidth.
Facility	Basic infrastructure is not evenly distributed, and there are many geographical, logistical, and socio-cultural challenges.	Collaboration between sectors is key to overcoming facility limitations.

### Mapping Cross-Sector Collaboration: From Process to Results and Challenges

Border area development cannot be separated from the involvement of various stakeholders working collaboratively. Cooperation between the central government, local governments, technical institutions, the private sector, and local communities plays an important role in the success of development interventions. To further understand these dynamics, a scheme is prepared that summarizes collaboration patterns, implementation processes that occur, concrete results achieved, and the main challenges faced in the form of a table. Table 2 aims to show how the complexity of interactions between parties can be the key to success or obstacles in border development.

**Table 2.** Mapping Cross-Sector Collaboration

Key Collaborations	Occurred Process	Results Achieved	Challenges Faced
Central Government – Regional Government – Technical Institutions	Synchronization of development programs (PLBN, national roads, transportation subsidies, etc.)	Sei Nyamuk PLBN completed, the national road in Sebatik in good condition	Village roads are still damaged, and regional budget capacity is limited
Local Government – BAKTI – Kominfo – Telecommunication Operators	Submission of BTS construction in blank spot areas, bandwidth request, provision of internet services	Several BTS have been built	Many BTS are not functioning optimally, bandwidth is only 50 Mbps and unstable.
Government – Private – Community Organizations	Provision of sea transportation services with rates set by the governor	Establishment of sea transportation routes and services	Fares are still high, lack of subsidies, and operational costs are more expensive than land transportation
Government – Education and Training Institutions – Local Communities	Human resource training in telecommunications, employee rotation, increasing socio-cultural understanding of border areas	Increasing awareness of the need for competent human resources	Lack of local human resources, skills gap, high turnover rate, lack of career paths and supporting facilities
Government – Private Investors – Financial Institutions	Planning for basic infrastructure development, procurement of heavy equipment from outside, building material logistics, land acquisition	Some road and basic facility construction have begun	High logistics costs, slow bureaucratic permits, geographical challenges, no investment guarantees due to high risks
Government – Security Forces – Malaysian Government (within the Malindo Sosek framework)	Bilateral cooperation in the fields of security and crossings, cross-border surveillance, security coordination, and joint border area development	Implementation of bilateral cooperation, strengthening of surveillance functions and cross-border posts	Geopolitical dynamics and differences in national interests, barriers to cross-country communication

## DISCUSSION

The government has established various international agreements with Malaysia and established laws and regulations in order to affirm territorial boundaries, increase security, develop regions, and improve services between countries. These agreements reflect the continued commitment of both Indonesia and Malaysia to fostering peaceful, productive, and secure bilateral relations. The variety and frequency of these agreements from boundary demarcation to socio-economic and digital cooperation indicate the dynamic nature of border management and the importance of collaboration in addressing cross-border issues. Moreover, updated and expanded agreements show the responsiveness of both governments to evolving challenges and the growing needs of border communities. These cooperative efforts not only strengthen diplomatic ties but also directly benefit the people living in border regions through improved infrastructure, mobility, and public services. This is in line with the collaborative governance framework as formulated by Emerson et al. (2012), where cross-sector and cross-level actors collectively seek to address complex shared problems.

The implementation of authority division under Law No. 23 of 2014 has been effective, especially in border areas where the central government leads spatial planning and infrastructure. The successful Sei Nyamuk Border Post highlights strong central–regional synergy. However, limited regional budgets hinder local road development. High maritime transport costs also suggest a need for subsidies. In telecommunications, infrastructure built by BAKTI remains underutilized due to low bandwidth (50 Mbps), disrupting services. The existence of regional budget limitations in the development of local infrastructure such as village roads and public facilities indicates weak collaborative

capacity at the horizontal level (between regional agencies), which is an important element in the Emerson et al. (2012) approach.

Training and technical development are needed to increase civil servants' capacity. Various materials must be taught, especially those related to border management and cross-border issues. Moreover, central employees assigned to cross-border posts require an understanding of the social and cultural conditions of border communities. Border areas often face challenges in retaining quality personnel due to their remote locations. An effective rotation system may be necessary to maintain civil servants' motivation and performance. The ability of civil servants to adapt to changing policies and border dynamics needs continuous improvement. Attention to the welfare of civil servants serving in border areas may also need enhancement to sustain motivation and performance. Furthermore, the performance evaluation system and ongoing capacity development efforts may require strengthening. These challenges indicate the critical need for targeted policies that address recruitment, retention, training, and welfare improvements, ensuring civil servants can effectively support border infrastructure development and telecommunications services.

The development of technological infrastructure can significantly improve the quality of life of people in border areas, strengthen national security, and improve government effectiveness. However, its implementation needs to consider challenges such as geography, resources, and the special needs of the local community. The application of technology in border areas can improve connectivity, security, and transportation efficiency, supporting economic and social development in the region. Nevertheless, the challenges of remote locations, limited populations, and resource constraints remain critical factors that may affect the feasibility and sustainability of such technological advancements (Ayuningtyas et al., 2024).

Efforts to enhance technological infrastructure should focus not only on physical deployment but also on ensuring accessibility, affordability, and local community engagement to maximize benefits. Strategic collaboration between government agencies, private sectors, and local stakeholders is essential to overcome the limitations imposed by geography and scale. Overcoming these challenges requires careful planning, strong coordination, and innovative infrastructure development, with active involvement of local communities and attention to each border area's unique conditions. Collaboration among various stakeholders is essential to quickly address basic infrastructure issues.

For instance, in telecommunications, border challenges are complex, involving security, economy, society, and technology, necessitating cross-sector collaboration. Since local governments have limited budgets and capacity, collaboration helps optimize resources. Moreover, collaboration aligns policies between central and regional governments, avoiding conflicts and ensuring consistent program implementation. It also speeds up decision-making, project execution, and reduces bureaucratic delays (Timothy & Tosun, 2020).

## **CONCLUSION**

Collaborative border management in the border areas of Indonesia and Malaysia has shown that cooperation between local governments, central government, and the private sector can accelerate the development of basic infrastructure. In this context, cross-sector collaboration creates better synergy in meeting community needs, improving accessibility, and reducing infrastructure gaps. Community involvement in infrastructure development is also important to increase a sense of ownership and responsibility for the facilities built. However, there are several limitations that need to be considered, such as dependence on subsidies or grants from the government that can create instability in the desire for inter-island transportation services. In addition, potential conflicts of interest between the public and private sectors and challenges in communication and coordination between local and central governments can hinder the effectiveness of collaboration. For further research, it is important to analyze the long-term impact of this collaboration on community welfare and explore alternative financing models that can reduce dependence

on government subsidies, such as more innovative public-private partnerships. Research should also consider the social and cultural aspects of infrastructure development and how community participation can be optimized. Finally, comparative studies with other countries that have similar approaches to border management can provide additional insights to improve the effectiveness of collaboration in border areas.

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