



Dynamic Governance in Post-Mining Landscapes: Cross-Sectoral Coordination for Sustainable Spatial Management

Frans Tory Damara Pradipta^{1*}, Lulu Aperianti², Sofa Sofiyanty³, Erlangga Amirro Hakim⁴, Novendra Hidayat⁵

¹Department of Political Science, Faculty of Social and Political Sciences, Universitas Bangka Belitung, Bangka, Indonesia; ²Department of Political Science, Faculty of Social and Political Sciences, Universitas Bangka Belitung, Bangka, Indonesia; ³Department of Political Science, Faculty of Social and Political Sciences, Universitas Bangka Belitung, Bangka, Indonesia; ⁴Department of Political Science, Faculty of Social and Political Sciences, Universitas Bangka Belitung, Bangka, Indonesia; ⁵Department of Political Science, Faculty of Social and Political Sciences, Universitas Bangka Belitung, Bangka, Indonesia

*Corresponding author: Frans Tory Damara Pradipta, Department of Political Science, Faculty of Social and Political Sciences, Universitas Bangka Belitung, Bangka, Indonesia. Email: franstory24@gmail.com

Abstract

Post-excavation land management presents challenges for local governments because spatial concerns involve environmental conditions, community interests, and the responsibilities of multiple institutions. In Lereng Bukit Siam, Bangka Regency, community objections to excavation activities prompted a government response, raising questions about coordination beyond immediate intervention. This study aims to analyze cross-sectoral coordination in post-excavation spatial management through the perspective of dynamic governance. The study employed a qualitative case study approach, drawing on interviews with representatives of the Bangka Regency Public Works and Spatial Planning Agency (PUPR) and local residents. Field observations, documentation, spatial planning regulations, media reports, and relevant academic literature supported the analysis. Data were examined using three dimensions of dynamic governance: Thinking Ahead, Thinking Again, and Thinking Across. The findings indicate that community concerns prompted a government response that included the cessation of excavation activities and the involvement of several institutional actors. However, the available evidence does not establish whether systematic monitoring, long-term policy evaluation, or land rehabilitation continued after excavation stopped. The findings distinguish an immediate administrative response from sustained, adaptive spatial governance. The study highlights the need to connect immediate government responses with longer-term spatial management through clearer institutional responsibilities, regular assessment of site conditions, and coordination mechanisms that support follow-up actions. These measures may help local governments strengthen adaptive governance and promote more sustainable post-excavation land management.

Keywords: Dynamic Governance, Cross-Sectoral Coordination, Spatial Management, Post-Excavation Land, Lereng Bukit Siam Introduction

Spatial management in post-excavation areas presents challenges involving land-use control, environmental protection, and the coordination of institutional responsibilities. Effective planning for post-mining land use requires consideration of regulatory frameworks, site-specific conditions, and decision-making criteria (Pagouni et al., 2024). In addition, post-mining land restoration requires appropriate reclamation strategies adapted to local environmental



conditions (Suwardi & Randrikasari, 2024). Regional post-mining land-use assessment can also benefit from interdisciplinary analysis and stakeholder involvement (Worden et al., 2024). In Bangka Belitung, post-mining land restoration remains an environmental concern because tin mining can alter soil properties and make ecological recovery a prolonged process (Putra et al., 2024). Research on post-mining tin lands in the region also highlights the importance of appropriate reclamation strategies to support land rehabilitation and more sustainable post-mining land use (Suwardi & Randrikasari, 2024). The importance of integrating ecological considerations into mining governance has also been emphasized in studies of tin mining in Bangka Belitung (Haryadi et al., 2024). These issues are relevant to the Lereng Bukit Siam area, Bangka Regency, where residents' objections to excavation activities in October 2025 prompted public attention and a government response to stop the activity (Yudi, 2025a; Yudi, 2025b). This study is situated within the broader challenge of ensuring that immediate responses to land-use concerns are connected to coordinated and sustainable post-excavation spatial management.

Previous studies have examined spatial management through different governance perspectives. Research on dynamic governance in green open-space management in Makassar highlights the relevance of adaptive institutional capabilities to spatial management (Fajri et al., 2020), while studies of stakeholder involvement in green open-space management emphasize the importance of cooperation among actors (Aliya & Suwitri, 2025). Other research has examined the application of dynamic governance in Indonesian bureaucratic reform (Widowati et al., 2023), mining-permit governance (Anggraini & Helmi, 2025), and disaster-mitigation-based green open-space planning (Pamungkas et al., 2026). Research on post-mining tin land rehabilitation in South Bangka has highlighted the importance of integrating environmental, economic, and social considerations into regional development planning (Setiawan et al., 2019). More recent studies on Bangka Island have emphasized the need for integrated land rehabilitation strategies that improve soil conditions and support sustainable post-mining land use (Priestiani et al., 2026). Taken together, these studies provide a foundation for understanding adaptive governance, institutional coordination, and sustainable land management, although they address contexts and policy concerns that differ from the post-excavation situation in Lereng Bukit Siam.

Recent research has examined cross-sectoral collaboration in post-mining environmental governance in Indonesia, emphasizing the importance of clear institutional responsibilities and collaborative mechanisms (Mustari et al., 2026). Studies of land-use change in Bangka Tengah have also highlighted the role of stakeholder consensus in addressing competing interests in land-use planning (Puspitasari & Pramono, 2022). Despite these contributions, the relationship between cross-sectoral coordination and post-excavation spatial management in the Lereng Bukit Siam area, Bangka Regency, remains insufficiently examined. Existing research has discussed sustainable mining governance and its legal and policy dimensions in Bangka Belitung (Pradipta, 2026a), while other studies have examined the broader relationship between environmental crises, social vulnerability, and governance responses (Pradipta et al., 2026). Nevertheless, these studies do not directly explain how coordination among relevant institutions operates in the Lereng Bukit Siam case. Local reports document residents' objections and the subsequent cessation of excavation, but the available evidence does not establish whether systematic monitoring, long-term policy evaluation, or land rehabilitation continued after the activity stopped (Yudi, 2025a; Yudi, 2025b). The central research gap is therefore the limited case-specific understanding of how cross-sectoral coordination is initiated, implemented, and connected to follow-up measures in post-excavation spatial management.

This study aims to analyze cross-sectoral coordination in post-excavation spatial management in the Lereng Bukit Siam area, Bangka Regency, using the dynamic governance perspective. The analysis focuses on the three dynamic capabilities of Thinking Ahead, Thinking Again, and Thinking Across developed by Neo and Chen (2007). Recent empirical studies have continued to apply these dimensions to examine adaptive governance, policy evaluation, and collaboration among government institutions (Antono et al., 2023; Ascarya & Harmawan, 2025). Specifically, the study addresses the following research question: How does cross-sectoral coordination operate in post-excavation spatial management in Lereng Bukit Siam, and how can this process be understood through the three dimensions of dynamic governance? This question

guides the examination of institutional responses, the reconsideration of existing measures, and collaboration among relevant actors.

To address the research question, this study employs a qualitative case study approach based on interviews, field observations, and documentary analysis. Primary data were obtained through interviews with representatives of the Spatial Planning Division of the Bangka Regency Public Works and Spatial Planning Agency (PUPR) and residents living near the study area. Secondary data included regional spatial planning regulations, relevant academic literature, and media reports concerning excavation activities and government responses. Field observations and research documentation were used to support the interpretation of the case. The data were analyzed descriptively using the three dimensions of dynamic governance: Thinking Ahead, Thinking Again, and Thinking Across (Neo & Chen, 2007). This analytical approach is consistent with recent empirical studies applying the framework to public governance, including multilevel coordination during crisis management and the evaluation of local public service delivery (Kurniawan et al., 2023; Khotimah et al., 2024). The analysis distinguishes documented actions and coordination practices from potential follow-up measures that have not been established by the available evidence.

The significance of this study lies in its examination of the relationship between immediate government responses and the broader requirements of adaptive, cross-sectoral spatial governance in a specific local context. By applying dynamic governance to post-excavation spatial management, the study extends the discussion beyond the cessation of excavation to questions of anticipatory planning, policy review, and collaboration among relevant institutions. The findings may provide an analytical reference for local governments and other stakeholders in identifying coordination needs and considering appropriate follow-up measures. The study also offers a case-based contribution to discussions of dynamic governance in spatial management, while recognizing that the available evidence does not establish the effectiveness or continuity of coordination over time.

In this study, cross-sectoral coordination refers to the communication and interaction among government institutions and other relevant actors involved in responding to post-excavation spatial management concerns. Post-excavation spatial management refers to the governance of land-use issues following the cessation of excavation, including consideration of subsequent land use, environmental conditions, and possible follow-up measures. Dynamic governance refers to the capacity of public institutions to adapt policies and practices to changing conditions through continuous learning and institutional adaptation (Neo & Chen, 2007; van Assche et al., 2022). Recent research on adaptive governance similarly emphasizes organizational learning, coordination, and responsiveness to changing social and environmental conditions (van Assche et al., 2022). Within this framework, Thinking Ahead concerns anticipating future challenges; Thinking Again concerns reviewing and reconsidering existing policies or responses; and Thinking Across concerns drawing on different perspectives, experiences, and institutional knowledge. These concepts serve as analytical dimensions rather than assumptions that effective coordination or sustained follow-up has already occurred.

The remainder of this article is organized into five main sections: the theoretical framework, methodology, findings, discussion, and conclusion. The theoretical framework explains the dynamic governance perspective and its three analytical dimensions. The methodology describes the research design, data sources, and analytical approach. The findings present the spatial context, community concerns, institutional responses, and documented coordination process in Lereng Bukit Siam. The discussion interprets these findings through Thinking Ahead, Thinking Again, and Thinking Across, while the conclusion summarizes the main findings, implications, and directions for future research.

Theoretical Framework

This study employs the concept of dynamic governance developed by Neo and Chen (2007) to examine cross-sectoral coordination in post-excavation spatial management. Dynamic governance refers to the capacity of public institutions to adapt policies and institutional practices to changing conditions through continuous learning, policy reconsideration, and collaboration (Neo & Chen, 2007). Recent governance research similarly emphasizes organizational learning,

policy adaptation, and coordination among institutions as important mechanisms for responding to changing and complex conditions (van Assche et al., 2022; van Assche et al., 2022a). This perspective is relevant to spatial management because land-use concerns may involve multiple actors, including government agencies, local administrative authorities, and affected communities. It provides an analytical basis for examining how institutions respond to emerging issues while considering the need for sustainable land management.

Dynamic governance comprises three interrelated capabilities: Thinking Ahead, Thinking Again, and Thinking Across (Neo & Chen, 2007). Thinking Ahead concerns anticipating future challenges and considering the long-term implications of current decisions, particularly for the future use and sustainability of post-excavation land. Research on post-mining land-use planning emphasizes the importance of assessing future land-use options in relation to environmental conditions, regional needs, and sustainability objectives (Worden et al., 2024). Thinking Again refers to reassessing existing policies, practices, and decisions in response to emerging problems, providing a basis for examining whether government responses are reviewed and evaluated. This dimension is relevant to post-mining governance, where land-use decisions require assessment of changing conditions and the suitability of rehabilitation strategies (Pagouni et al., 2024). Thinking Across emphasizes learning from different perspectives, experiences, and institutional knowledge beyond organizational boundaries. Recent studies highlight the value of interdisciplinary assessment and stakeholder participation in post-mining land-use planning (Worden et al., 2024). Together, these dimensions provide a framework for analyzing anticipatory planning, policy evaluation, and collaboration in spatial management.

In the Lereng Bukit Siam case, these three dimensions are applied to examine cross-sectoral coordination among the Bangka Regency Public Works and Spatial Planning Agency (PUPR), local administrative authorities, and residents in responding to excavation-related concerns. This focus is consistent with recent research emphasizing the importance of clearly defined institutional responsibilities and community participation in cross-sectoral post-mining environmental governance in Indonesia (Mustari et al., 2026). The framework distinguishes documented government actions and coordination practices from assumptions about effective governance or sustained institutional collaboration. Accordingly, the analysis considers whether the available evidence demonstrates attention to future land management, reconsideration of existing responses, and the exchange of knowledge among relevant actors. This approach enables the study to identify both the coordination practices documented in the case and the areas requiring further assessment or improvement.

Methods

Research Design

This study employed a qualitative approach with a case study design to examine cross-sectoral coordination in post-excavation spatial management in the Lereng Bukit Siam area, Bangka Regency, Indonesia. The qualitative approach was selected because the study focused on understanding institutional responses, interactions among relevant stakeholders, and coordination processes within a specific spatial management context. Qualitative case study methods are well suited to examining complex institutional relationships and collaboration processes within their real-world settings (Supranoto et al., 2025). The case study design enabled an in-depth examination of the issue through interviews, field observations, and document analysis. This approach allowed the study to identify the actions undertaken by relevant actors and examine the relationship between government responses, cross-sectoral coordination, and the need for sustainable spatial management.

Data Sources

This study used primary and secondary data. Primary data were obtained through interviews with representatives of the Spatial Planning Division of the Bangka Regency Public Works and Spatial Planning Agency (PUPR) and residents living near the study area. The PUPR representative was considered relevant because the agency is associated with spatial planning responsibilities, while nearby residents were included to provide perspectives on local conditions and excavation-

related concerns. These sources were selected to obtain both institutional and community perspectives on responses to spatial management issues in Lereng Bukit Siam. Secondary data consisted of regional spatial planning regulations, relevant academic literature, and media reports concerning excavation activities and government responses in Lereng Bukit Siam. These sources were used to establish the policy context, examine documented developments, and compare information obtained from different sources. Field observations and documentation were also used to provide contextual information about the research setting and support the interpretation of the findings.

Research Instruments

The data collection instruments comprised interview questions, field observations, and document examination. The interviews focused on government responses to excavation-related concerns, the involvement of relevant actors, coordination practices, and follow-up measures in spatial management. Field observations were used to obtain contextual information relevant to the research problem, while document examination focused on identifying applicable policy provisions and documented developments concerning the study area. The research focus and interpretation of the data were guided by the Dynamic Governance framework developed by Neo and Chen (2007), particularly its three dimensions: Thinking Ahead, Thinking Again, and Thinking Across. These dimensions provided an analytical orientation for examining consideration of future conditions, the reassessment of existing responses, and coordination and the exchange of perspectives among relevant actors. The framework helped ensure that the information examined remained relevant to the research questions and objectives.

Data Collection and Procedure

Data were collected through interviews, field observations, documentation, and document examination. Interviews were conducted with a representative of the PUPR Spatial Planning Division of Bangka Regency and residents living near Lereng Bukit Siam to obtain information about excavation-related concerns, government responses, and the involvement of relevant actors in spatial management. Field observations were used to complement the understanding of the research context, while documentation helped record information relevant to the conditions of the study area. Document examination was subsequently conducted using regional spatial planning regulations, relevant academic literature, and media reports concerning excavation activities and government responses in Lereng Bukit Siam. Information obtained from these sources was compiled and organized according to its relevance to the research focus. This procedure enabled the researcher to compare informants' perspectives with information available in documentary and supporting sources, thereby reducing reliance on a single type of data source.

Data Analysis

The data were analyzed descriptively using the study adopts the Dynamic Governance framework developed by Neo and Chen (2007), which has also been applied in recent empirical research to examine adaptive policymaking and coordination in public institutions (Antono et al., 2023; Wialdi et al., 2023). The analysis involved three main stages. First, information obtained from interviews, observations, documentation, and document examination was organized according to its relevance to the research question. Second, the information was categorized and interpreted using the three dimensions of Dynamic Governance. Thinking Ahead was used to examine whether the documented responses considered future land use and the sustainability of the area. Thinking Again guided the examination of whether existing responses were reconsidered or evaluated in response to emerging concerns. Meanwhile, Thinking Across was used to analyze coordination and the exchange of perspectives among relevant institutions and community actors. Third, findings from different sources were compared to identify documented coordination practices, limitations in the available evidence, and aspects requiring further improvement. The analysis distinguished actions supported by the available evidence from recommendations for future policy development. The involvement of multiple actors was not automatically interpreted as evidence of effective and sustained coordination. Accordingly, conclusions were drawn based on the information available in the research sources.

Data Accuracy

Data accuracy was addressed by comparing information obtained from interviews with field observations and relevant documentary sources, including regional regulations and media reports. This comparison was used to examine the consistency of information concerning excavation-related concerns, institutional responses, and spatial management in the study area. Information from a single source was not automatically treated as a comprehensive account when other sources were available for comparison. During the analysis, the researcher also distinguished information directly supported by the data from interpretations developed through the Dynamic Governance framework. Where the available sources did not demonstrate sustained coordination, policy evaluation, or long-term follow-up, these activities were not assumed to have occurred. Instead, limitations in the available evidence were treated as part of the analytical findings and reported proportionately. This approach helped prevent conclusions from extending beyond what the available information could support.

Trustworthiness

The trustworthiness of the data was supported by comparing information obtained through interviews, observations, and documentary sources. This comparison helped examine the issue from different perspectives and assess the consistency of information concerning government responses and cross-sectoral coordination. The credibility of the analysis was supported by linking the findings to the available evidence rather than relying solely on the researcher's assumptions. Dependability was addressed by organizing and interpreting the data according to the research question and the three dimensions of Dynamic Governance. Confirmability was considered by grounding interpretations in relevant empirical and documentary information. Transferability was supported by describing the context of Lereng Bukit Siam, the actors associated with the issue, and the spatial management concerns examined in the study. This contextual description allows readers to assess the relevance of the findings to comparable cases in other areas. All interpretations remained limited to the scope and completeness of the available data.

Ethical Review

This study involved interviews with government personnel and community members, ethical considerations concerning participants' rights and interests were relevant to the research process. Participants should be informed about the purpose of the study and the intended use of the information they provide, and their participation should be voluntary. Participants' identities and personal information should be protected where confidentiality is necessary, particularly when the information concerns spatial management issues and institutional responses. The reporting of research ethics must reflect the procedures actually followed, including whether informed consent was obtained, how participant identities and interview records were handled, and whether formal ethical approval was required or obtained from the relevant institution. The name of the approving ethics committee and the approval reference number should be provided only if such information is available. This approach ensures transparent ethical reporting and avoids claiming approval or procedures that cannot be substantiated.

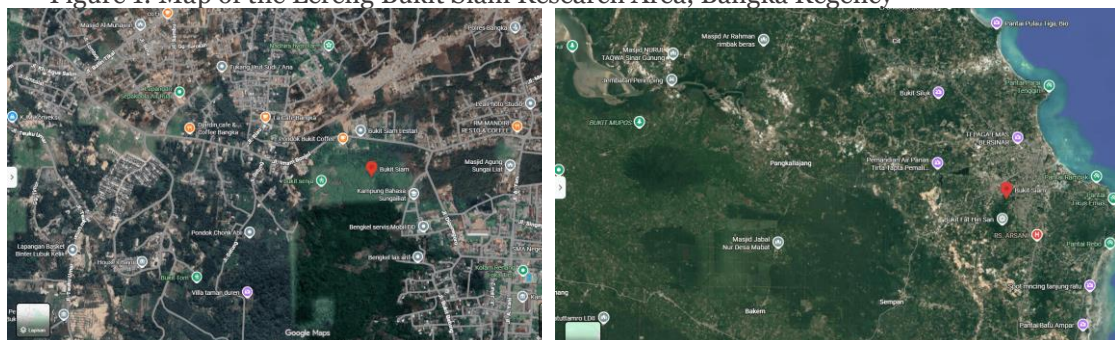
Findings

Spatial Context of the Lereng Bukit Siam Area

The Lereng Bukit Siam area in Bangka Regency provides the spatial context for examining cross-sectoral coordination in post-excavation land management. The issue concerns the relationship between land utilization, environmental considerations, and the implementation of regional spatial planning. Residents' objections to excavation activities in October 2025 brought attention to the management of the area and prompted a government response (Yudi, 2025a; Yudi, 2025b). The spatial context is important because post-excavation management involves more than the cessation of excavation activities. It also raises questions about the subsequent use of the land, environmental considerations, and the roles of institutions responsible for spatial planning and

related public affairs. These aspects provide the basis for examining how relevant actors coordinate their responses within the existing spatial planning framework.

Figure 1: Map of the Lereng Bukit Siam Research Area, Bangka Regency



Source: Google Maps

The map identifies the study area and provides geographical context for the findings discussed in the following subsections. The spatial information should be interpreted alongside field observations and interview evidence to distinguish the physical characteristics of the site from the institutional processes involved in its management.

Post-Excavation Site Conditions and Community Concerns

Excavation activities in the Lereng Bukit Siam area became a public concern in October 2025, when residents raised objections to the activity. Local media reports documented community concerns and calls for government intervention, followed by a response from the Bangka Regency Government to stop the excavation (Yudi, 2025a; Yudi, 2025b). This situation illustrates the importance of considering community concerns in spatial management, particularly when land-use activities raise questions about environmental conditions and the future use of the area. Community perspectives provide an important source of information for understanding the issues surrounding the site. Interviews with residents can help explain their concerns, their understanding of the excavation activities, and their expectations regarding subsequent land management. These perspectives are considered alongside site observations and relevant documentation to provide context for examining the government's response and coordination with other actors.

Figure 2: Field Documentation of the Lereng Bukit Siam Post-Excavation Area



Figure 3: Interview with Residents Regarding Post-Excavation Land Management



The photographs and interview findings should be used to describe the conditions and concerns directly documented during the research. The available evidence of public objections and the cessation of excavation do not, by itself, establish whether the land has undergone rehabilitation or whether long-term environmental monitoring has been conducted. These matters therefore require separate evidence before conclusions can be drawn.

Institutional Responses and Cross-Sectoral Coordination

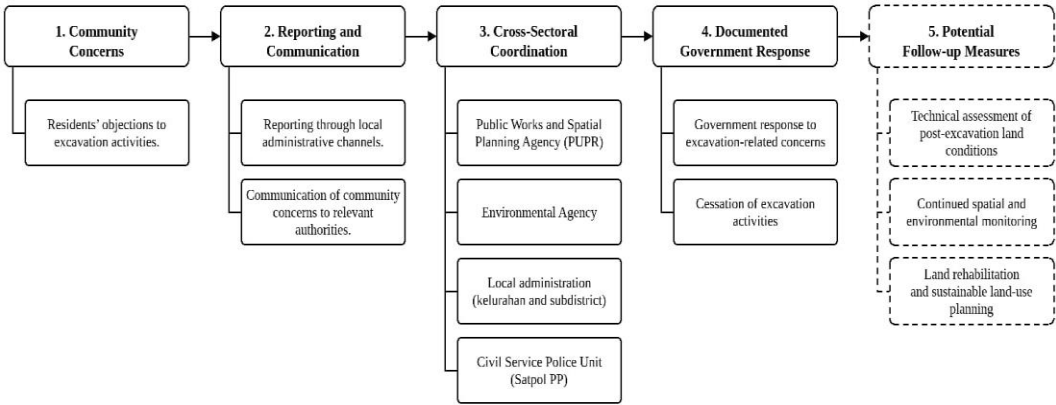
The government response to excavation-related concerns in the Lereng Bukit Siam area involved action to stop the excavation and communication through local administrative channels. Available information indicates that the issue was reported through the subdistrict administrative structure and discussed through coordination involving relevant actors, including the Public Works and Spatial Planning Agency (PUPR), the Environmental Agency, the village administration, and the Civil Service Police Unit (Satpol PP). These institutional roles provide a basis for examining how spatial management concerns are communicated and addressed across government sectors. The involvement of different actors suggests that the issue extends beyond the responsibility of a single institution. Spatial planning, environmental considerations, local administration, and enforcement may require distinct but interconnected responsibilities. In this context, cross-sectoral coordination is relevant to understanding how information is conveyed, how institutional responsibilities are connected, and how responses are organized. However, the participation of multiple actors alone does not establish the effectiveness or continuity of coordination.

The interviews with PUPR and local administrative representatives are intended to clarify the institutional response, communication pathways, and division of responsibilities in the case. Their accounts should be compared with one another and with available documentary evidence to identify both coordination practices and limitations. Based on the evidence currently available, the government response and involvement of several actors can be identified, but sustained monitoring and long-term evaluation after the excavation ceased have not been established.

Mapping the Cross-Sectoral Coordination Process

The findings indicate that the response to excavation-related concerns in the Lereng Bukit Siam area involved several stages, beginning with community concerns, followed by reporting through local administrative channels and government action to stop the excavation. The available information also identifies coordination involving relevant government actors, including PUPR, the Environmental Agency, local administrative authorities, and Satpol PP. These elements provide the basis for mapping the coordination process documented in the case. The coordination process can be understood through three interconnected components: the emergence and communication of concerns, the institutional response, and the need for follow-up in post-excavation land management. The first component concerns how community concerns reach government institutions. The second concerns how relevant actors become involved in responding to the reported issue. The third highlights the importance of determining whether further assessment, monitoring, or land rehabilitation is required. The available evidence documents the initial response but does not establish the implementation of sustained follow-up activities.

Figure 4: Conceptual Map of Cross-Sectoral Coordination in Post-Excavation Spatial Management in Lereng Bukit Siam



The conceptual map should distinguish documented actions from analytical implications. Community concerns, reporting through administrative channels, and the cessation of excavation represent elements of the reported response. Meanwhile, continued monitoring, technical assessment, and rehabilitation should be presented as potential follow-up measures unless field evidence confirms that they have been implemented. This distinction helps clarify the current coordination process without assuming that all stages of post-excavation management have been completed.

Discussion

The concept of dynamic governance provides a theoretical basis for understanding how public institutions respond to changing conditions, reconsider existing policies, and collaborate across institutional boundaries (Neo & Chen, 2007; Antono et al., 2023). In spatial management, these capabilities are important because responding to land-use concerns requires more than addressing immediate problems; it also involves anticipating long-term land-use options, evaluating existing decisions, and coordinating relevant actors (Pagouni et al., 2024; Worden et al., 2024). Research on post-mining tin land rehabilitation in South Bangka emphasizes the importance of aligning land recovery with environmental, economic, and social objectives for regional development (Setiawan et al., 2019). More recent research in Bangka Belitung further highlights the role of community participation and supportive institutional arrangements in sustainable post-mining land restoration (Herdiyanti et al., 2026). While studies of spatial management and bureaucratic reform highlight the relevance of governance capacity and institutional adaptation (Fajri et al., 2020; Widowati et al., 2023). This paragraph establishes the theoretical and empirical background by connecting dynamic governance with previous studies on spatial management, land rehabilitation, and institutional adaptation.

Against this background, the study examines how cross-sectoral coordination operates in post-excavation spatial management in the Lereng Bukit Siam area, Bangka Regency, and how this process can be understood through the dimensions of Thinking Ahead, Thinking Again, and Thinking Across. This focus is supported by recent research emphasizing the importance of cross-sectoral collaboration in post-mining environmental governance and the integration of stakeholder perspectives into post-mining land-use planning (Mustari et al., 2026; Worden et al., 2024). The analysis considers the relationship between immediate government responses and the broader requirements of sustainable spatial management. The regional spatial planning framework provides a policy context for considering future land utilization in Bangka Regency (Pemerintah Kabupaten Bangka, 2024), while spatial-use conformity procedures are relevant to assessing the alignment of proposed land uses with applicable planning requirements (Suryaningsih et al., 2026). These considerations provide a basis for examining whether the documented response extends beyond the cessation of excavation toward a more comprehensive approach to spatial management.

The main finding is that the documented government response included the cessation of excavation following community concerns, but the available evidence does not establish whether

sustained post-excavation management was subsequently implemented. This finding is relevant to all three dimensions of dynamic governance. From the Thinking Ahead perspective, the evidence does not establish whether long-term land use and rehabilitation were addressed through a subsequent management strategy. From the Thinking Again perspective, the available information does not confirm whether the response was systematically evaluated. From the Thinking Across perspective, although several institutions were reportedly involved, the evidence does not establish whether their involvement developed into sustained coordination and joint follow-up.

One important finding is the distinction between an immediate administrative response and the broader institutional processes required for adaptive spatial governance. Stopping excavation can address an immediate concern, but it does not necessarily resolve questions about the future condition of the land, environmental recovery, or the division of responsibilities for subsequent management. The involvement of the Public Works and Spatial Planning Agency (PUPR), the Environmental Agency, local administrative authorities, and the Civil Service Police Unit (Satpol PP) indicates that the issue involved multiple institutional actors. Nevertheless, the presence of several actors alone cannot demonstrate that their responsibilities were integrated into a coordinated and continuing management process. This distinction helps clarify the difference between a documented response and evidence of longer-term governance capacity.

An unexpected aspect of the case is that the documented cessation of excavation does not provide sufficient evidence to establish what happened during the subsequent management phase. Although the immediate response is reported in the available sources (Yudi, 2025b), the evidence presented in this study does not confirm whether technical assessments, continued monitoring, land rehabilitation, or formal policy evaluation followed. This absence of documented evidence should not be interpreted as proof that no further activities occurred. Rather, it indicates that the available materials are insufficient to determine the extent of subsequent action. The finding therefore highlights a limitation in what can be concluded about the continuity of spatial management after the immediate problem was addressed.

The findings are consistent with previous research emphasizing the importance of governance capacity, institutional adaptation, and the integration of spatial management objectives. Studies of green open-space management in Makassar and green open-space planning in Palu have examined the relevance of governance capabilities to spatial management challenges (Fajri et al., 2020; Pamungkas et al., 2026). Research on post-tin-mining land rehabilitation in South Bangka highlights the need to align land recovery with regional development objectives (Setiawan et al., 2019). Recent research on tin mining and reclamation in Bangka Belitung further emphasizes the importance of integrating ecological restoration with socioeconomic development and institutional considerations (Marsandi et al., 2025). Similarly, research on sustainable mining governance in Bangka Belitung underscores the importance of institutional and environmental considerations in mining-related decision-making (Haryadi et al., 2024). Although these studies address contexts that differ from Lereng Bukit Siam, they support the broader argument that spatial and mining-related concerns require attention to institutional capacity and longer-term management beyond immediate responses.

The present findings differ in analytical emphasis from studies that examine governance capabilities as approaches to addressing spatial management challenges, because the available evidence in this case does not establish whether those capabilities were sustained after the immediate response. Research on dynamic governance in spatial management provides a framework for understanding institutional responses to complex spatial issues (Fajri et al., 2020; Pamungkas et al., 2026), while studies of bureaucratic reform emphasize the relevance of institutional adaptation to changing governance demands (Widowati et al., 2023). However, the findings presented here do not provide sufficient grounds to conclude that the case directly contradicts the empirical results of those studies. Instead, the comparison highlights a difference in the evidence available: the Lereng Bukit Siam case documents an immediate response but does not establish the continuity of policy evaluation, institutional learning, or cross-sectoral collaboration.

A possible explanation for these findings is that responding to an immediate land-use concern and establishing a continuing management process involve different institutional

requirements. The cessation of excavation represents a response to the immediate issue, whereas long-term management may require further technical assessment, clarification of institutional responsibilities, policy review, and coordination among relevant actors. The Thinking Ahead dimension emphasizes anticipation and consideration of future consequences, while Thinking Again concerns the reassessment of existing responses, and Thinking Across highlights learning and collaboration beyond institutional boundaries (Neo & Chen, 2007). Recent empirical applications of the Dynamic Governance framework have used these dimensions to examine long-term planning, policy evaluation, and coordination among government institutions and other stakeholders (Ascarya & Harmawan, 2025; Pamungkas et al., 2026). These dimensions help explain why an immediate response cannot, by itself, be treated as evidence of comprehensive adaptive governance. Nevertheless, this explanation remains an analytical interpretation rather than a confirmed account of the internal decision-making processes of the institutions involved.

The findings should be interpreted cautiously because the available evidence does not establish the full sequence of institutional actions following the cessation of excavation. The absence of documented evidence regarding monitoring, rehabilitation, policy evaluation, or sustained collaboration does not necessarily mean that these activities never occurred. It means that their implementation cannot be confirmed from the materials examined in this study. A general proposition emerging from the case is that the continuity of post-excavation spatial management may depend on whether immediate responses are followed by systematic evaluation, clear institutional responsibilities, and coordination among relevant actors. This proposition should be treated as a hypothesis for further investigation rather than a general conclusion applicable to all spatial management cases.

The findings have implications for spatial planning practice and future research because they highlight the need to connect immediate responses with documented follow-up measures. For policy practice, relevant institutions could consider clarifying their respective responsibilities, assessing the condition and potential future use of the site, and establishing appropriate monitoring and evaluation arrangements where required by the applicable policy framework. These are recommendations for potential improvement, not outcomes demonstrated by the present study. For future research, comparative case studies could examine how local governments manage post-excavation areas over time, while further interviews and documentary analysis could investigate institutional decision-making, follow-up activities, and coordination among agencies. Such research would help determine under what conditions immediate government responses develop into sustained and adaptive spatial management.

Conclusion

This study aimed to examine cross-sectoral coordination in post-excavation spatial management in the Lereng Bukit Siam area, Bangka Regency, through the perspective of dynamic governance. The study focused on how institutional responses and coordination practices could be understood through the dimensions of Thinking Ahead, Thinking Again, and Thinking Across. The main findings show that community concerns prompted a government response that included the cessation of excavation activities and the involvement of several institutional actors. However, the available evidence does not establish whether sustained monitoring, long-term policy evaluation, or land rehabilitation followed the cessation of excavation. The findings therefore distinguish an immediate administrative response from a continuous process of adaptive spatial governance.

In terms of their implications for the field of knowledge, the findings demonstrate the analytical value of applying dynamic governance to examine the relationship between immediate government responses and the broader requirements of anticipatory planning, policy evaluation, and cross-sectoral collaboration. The study contributes a case-specific perspective on post-excavation spatial management by highlighting the importance of examining not only whether a response occurs, but also whether subsequent management measures can be established through available evidence. Although the study is limited by the scope of the available data and the lack of confirmed evidence concerning long-term follow-up, it identifies an important area for further investigation: the continuity of coordination after an immediate government response. For future research, comparative studies and longitudinal investigations are recommended to examine how

interinstitutional collaboration develops over time and whether subsequent spatial management measures are implemented. Further research could also investigate institutional decision-making, site assessment, and the relationship between policy provisions and implementation. For policy and practice, relevant institutions should consider clarifying institutional responsibilities, conducting appropriate assessments of site conditions, and establishing coordination, monitoring, and evaluation mechanisms for post-excavation management. These measures could help connect immediate responses with longer-term spatial planning and sustainable land management in Bangka Regency.

Ethics approval

This study was conducted under a research permit issued by the relevant authority. Informed consent was obtained from the participants before data collection.

Acknowledgments

The research team would like to express its gratitude to Dr. Novendra Hidayat, M.Si., for his guidance, direction, and valuable feedback throughout the research process and manuscript preparation. The team also thanks the Institute for Research and Community Service (LPPM), Universitas Bangka Belitung, for its support and facilities through the 2026 Off-Campus Study (KLK) Research Scheme. Appreciation is extended to the Bangka Regency Public Works and Spatial Planning Agency (PUPR), residents of the Lereng Bukit Siam area, and all informants who contributed their time and information to this study. The team also thanks all research team members and other parties who supported the completion of the research and manuscript.

Competing interests

All the authors declare that there are no conflicts of interest.

Funding

This study was supported by the Institute for Research and Community Service (LPPM), Universitas Bangka Belitung, through the 2026 Off-Campus Study (KLK) Research Scheme.

Underlying data

Derived data supporting the findings of this study are available from the corresponding author upon reasonable request.

Declaration of artificial intelligence use

This study used ChatGPT, an AI-based language model, to assist with manuscript preparation, including language refinement, section organization, and suggestions for improving clarity and readability. We confirm that all AI-assisted processes were critically reviewed by the authors to ensure the integrity and reliability of the results. The final decisions and interpretations presented in this article were solely made by the authors.

How to cite

Pradipta, F. T. D., Aperianti, L., Sofiyanty, S., Hakim, E. A., & Hidayat, N. (2026). Dynamic Governance in Post-Mining Landscapes: Cross-Sectoral Coordination for Sustainable Spatial Management. *Journal of Society Innovation and Development*, 8(1), 568–582. <https://doi.org/10.63924/jsid.v8i1.374>

References

- Abil, A. (2023). Pengendalian pemanfaatan ruang permukiman di sempadan Sungai Alliritengae Kecamatan Turikale Kabupaten Maros. *Urban and Regional Studies Journal*, 6(1), 138–142. <https://doi.org/10.35965/ursj.v6i1.3798>
- Aliya, F. N., & Suwitri, S. (2025). Peran stakeholders dalam penataan ruang terbuka hijau (RTH) Kecamatan Tugu Kota Semarang. *Journal of Management and Public Policy*, 15(1), 120–135. <https://doi.org/10.14710/jppmr.v15i1.54910>

- Anggraini, V., & Helmi, R. F. (2025). The dynamic governance in the implications of mining permit: A case study in Bawan Village, Agam Regency. *TOFEDU: The Future of Education Journal*, 4(7), 2662–2669. <https://doi.org/10.61445/tofedu.v4i7.911>
- Antono, A., Ngalmun, N., Gunarto, G., Nuraini, H., Sulistyoningih, E., & Rosyadi, S. (2023). Village governance through spirit of dynamic governance in village government, Indonesia. *International Journal of Social Science Research and Review*, 6(3), 37–44. <https://doi.org/10.47814/ijssrr.v6i3.910>
- Ascarya, P. G., & Harmawan, B. N. (2025). Dynamic governance dalam penyelenggaraan Nganjuk Smart City oleh pemerintah daerah Kabupaten Nganjuk. *Jurnal Pemerintahan dan Politik*, 10(4), 706–724. <https://doi.org/10.36982/jpp.v10i4.5821>
- Fajri, F. Y. K., Khaerah, N., & Razak, F. S. H. (2020). Dynamic governance dalam pengelolaan ruang terbuka hijau di Kota Makassar. *Journal of Government and Politics (JGOP)*, 2(2), 104–112. <https://doi.org/10.31764/jgop.v2i2.2300>
- Harahap, F. R. (2016). Restorasi lahan pasca tambang timah di Pulau Bangka. *Society*, 4(1), 61–69. <https://doi.org/10.33019/society.v4i1.36>
- Haryadi, D., Ibrahim, & Darwance. (2024). Membangun tata kelola pertambangan timah yang ekosentris di Kepulauan Bangka Belitung. *Bina Hukum Lingkungan*, 8(3), 235–257. <https://doi.org/10.24970/bhl.v8i3.276>
- Herdianti, H., Suyanto, B., & Mas'udah, S. (2026). Social capital and ecological transformation in post-mining land restoration in Indonesia. *Ambio*, 55(2), 433–449. <https://doi.org/10.1007/s13280-025-02223-8>
- Kasmono. (2015, June 12). Pemkab tetapkan Taman Kehati seluas 15 hektare. *ANTARA News Bangka Belitung*. <https://babel.antaranews.com/berita/23611/pemkab-tetapkan-taman-kehati-seluas-15-hektare>
- Kasmono. (2018, April 24). Plt Bupati Bangka: Kelangsungan bumi tanggung jawab bersama. *ANTARA News Bangka Belitung*. <https://babel.antaranews.com/berita/75445/plt-bupati-bangka-kelangsungan-bumi-tanggung-jawab-bersama>
- Kasmono. (2020a, February 23). Pramuka Saka Kalpataru Bangka gelar kegiatan sosial pungut sampah. *ANTARA News Bangka Belitung*. <https://babel.antaranews.com/berita/132098/pramuka-saka-kalpataru-bangka-gelar-kegiatan-sosial-pungut-sampah>
- Kasmono. (2020b, February 24). Pramuka Saka Kalpataru Bangka gelar kegiatan pungut sampah. *ANTARA News Bangka Belitung*. <https://babel.antaranews.com/berita/132134/pramuka-saka-kalpataru-bangka-gelar-kegiatan-pungut-sampah>
- Khotimah, P. E., Suprastiyo, A., & Suhindarno, H. (2024). Dynamic governance dalam pelayanan administrasi kependudukan di Dinas Kependudukan dan Pencatatan Sipil Kabupaten Bojonegoro. *Reformasi: Jurnal Ilmiah Ilmu Sosial dan Ilmu Politik*, 14(1), 86–98. <https://doi.org/10.33366/rfr.v14i1.5432>
- Kurniawan, R. C., Faedlulloh, D., Warganegara, A., & Hermawan, D. (2023). Multilevel dynamic governance in dealing with crisis: The case of handling corona virus disease 19 (COVID-19) in Lampung Province, Indonesia. *Cogent Social Sciences*, 9(1), Article 2222574. <https://doi.org/10.1080/23311886.2023.2222574>
- Maharani, E., Lalang, M., Pradipta, F. T. D., & Fadly, Z. A. S. (2026a). Tata kelola dan kerangka hukum pengembangan green agribusiness pada lahan pascatambang timah di Bangka Belitung. *Journal of Contemporary Business Law*, 1(2), 9–16. <https://ojs2.adzkia.ac.id/index.php/jcbl/article/view/68>
- Maharani, E., Pradipta, F. T. D., Fadly, Z. A. S., & Lalang, M. (2026b). Juridical analysis of sustainable food agricultural land protection policy in controlling land conversion and its impact on the agribusiness sector. *Punggawa Law Review*, 1(3), 18–23. <https://punggawajournal.com/plr/article/view/35>
- Marsandi, F., et al. (2025). Tin mining and post-tin mining reclamation initiatives in Indonesia: With special reference to Bangka Belitung areas. *Land*, 14(10), Article 1947. <https://doi.org/10.3390/land14101947>

- Mustamin, M., & Firmanto, T. (2026). Legal politics of spatial utilization for residential areas in the Regional Spatial Plan Regulation of Bima City (2021–2024). *Jurnal Hukum Prasada*, 13(1), 17–27. <https://doi.org/10.22225/jhp.13.1.2026.17-27>
- Mustari, S., Rifdan, Romansyah, & Herman. (2026). The implementation of cross-sector collaboration in post-mining environmental governance in Indonesia. *Journal of Indonesian Scholars for Social Research*, 6(1), 8–16. <https://doi.org/10.59065/jissr.v6i1.257>
- Muttaqin, M. A. (2022). Membangun kebijakan adaptif menuju dynamic governance. *Jurnal Wacana Kinerja*, 25(1). <https://doi.org/10.31845/jwk.v25i1.773>
- Neo, B. S., & Chen, G. (2007). *Dynamic governance: Embedding culture, capabilities and change in Singapore*. World Scientific. <https://doi.org/10.1142/6458>
- Nurhayati, E. B. M. (2025, October 14). Warga protes pengerukan tanah di lereng Bukit Siam, Yusrizal minta Pemkab Bangka pasang plang larangan. *Erabaru Media*. <https://www.erabarumedia.id/berita/216701928/warga-protes-pengerukan-tanah-di-lereng-bukit-siam-yusrizal-minta-pemkab-bangka-pasang-plang-larangan>
- Pagouni, C., Pavloudakis, F., Kapageridis, I., & Yiannakou, A. (2024). Transitional and post-mining land uses: A global review of regulatory frameworks, decision-making criteria, and methods. *Land*, 13(7), Article 1051. <https://doi.org/10.3390/land13071051>
- Pamungkas, Y., Darwis, & Sisrilnardi. (2026). Penataan ruang terbuka hijau (RTH) berbasis mitigasi bencana dalam perspektif dynamic governance: Studi kasus RTH publik Kota Palu. *Jurnal Studi Inovasi Pemerintahan*, 2(2).
- Pemerintah Kabupaten Bangka. (2024). *Peraturan Daerah Kabupaten Bangka Nomor 2 Tahun 2024 tentang Rencana Tata Ruang Wilayah Kabupaten Bangka Tahun 2024–2044*. <https://jdih.bangka.go.id/content/peraturan-daerah-kabupaten-bangka-nomoir-2-tahun-2024-tentang-rencana-tata-ruang-wilayah>
- Pradipta, F. T. D. (2026a). Politik hukum tata kelola pertambangan timah dalam perspektif pembangunan berkelanjutan di Provinsi Kepulauan Bangka Belitung. *Jurnal Sutasoma*, 4(2), 31–42. <https://ejournal.universitastaban.ac.id/index.php/jurnalsutasoma/article/view/455>
- Pradipta, F. T. D. (2026b). Smart governance, weak implementation? Evaluating digital civil servants competence in the age of e-government. *Jurnal MSDA (Manajemen Sumber Daya Aparatur)*, 14(1), 103–123. <https://doi.org/10.33701/jmsda.v14i1.6148>
- Pradipta, F. T. D., Irawan, H. A., & Rahmadani, S. (2026). Krisis ekologis dan kerentanan sosial dalam tata kelola kabut asap di Indonesia tahun 2026. *Journal of University Students in Multidisciplinary Subject*, 2(1), 55–77. <https://doi.org/10.69673/junistuject.v2i1.272>
- Priestiani, Lesta, & Badriyah. (2026). Kajian literatur strategi rehabilitasi lahan bekas tambang timah sebagai lahan pertanian berkelanjutan di Pulau Bangka. *AGROSCIENCE*, 16(1), 40–53. <https://doi.org/10.35194/agsci.v16i1.6224>
- Puspitasari, A. E., & Pramono, R. W. D. (2022). Consensus on land use change in Bangka Tengah Regency. *Jurnal Kawistara*, 12(3). <https://doi.org/10.22146/kawistara.78677>
- Putra, H. F., Bui, L. T., & Mori, Y. (2024). Microbial community shifts indicate recovery of soil physical properties in a post-tin-mining area on Belitung Island, Indonesia. *Land Degradation & Development*, 35(7), 2395–2408. <https://doi.org/10.1002/ldr.5068>
- Putri, D. Y., & Mawar. (2025). Penerapan dynamic governance dalam pengembangan ruang terbuka hijau (RTH) di Kota Tangerang Selatan. *Sosial Simbiosis: Jurnal Integrasi Ilmu Sosial dan Politik*, 2(2), 1–9. <https://doi.org/10.62383/sosial.v2i2.1395>
- Ratnasari, C. (2025). Penegakan hukum lingkungan hidup melalui instrumen hukum administrasi dan hukum pidana terhadap korporasi yang tidak melakukan reklamasi pasca tambang (Studi kasus reklamasi tambang timah di daerah Bangka Provinsi Bangka Belitung). *LITRA*, 3(2). <https://doi.org/10.24198/litra.v3i2.947>
- Redaksi. (2026, August 6). Mahasiswa Program Studi Ilmu Politik UBB kaji keluhan kesah masyarakat pasca penggalian tanah di kawasan lereng Bukit Siam. *Garuda Merdeka*. <https://garudamerdeka.id/2026/08/06/mahasiswa-program-studi-ilmu-politik-ubb-kaji-keluh-kesah-masyarakat-pasca-penggalian-tanah-di-kawasan-lereng-bukit-siam/>

- Safriansyah, T., & Anggraini, D. (2026). Pendekatan dynamic governance dalam perencanaan pembangunan di Kota Palembang. *Jurnal STIA Bengkulu*, 12(2), 185–194. <https://doi.org/10.56135/jsb.v12i2.349>
- Setiawan, F., Murtalaksono, K., & Widiatmaka, W. (2019). Arahkan rehabilitasi lahan pasca tambang timah untuk pengembangan wilayah di Kabupaten Bangka Selatan. *Tataloka*, 21(4), 660–668. <https://doi.org/10.14710/tataloka.21.4.660-668>
- Supranoto, L., Sasmito, L., Indriastuti, S., Prayitno, H., & Sawir, M. (2025). From parallel to partnership governance: Strengthening institutional synergy for stunting reduction in decentralized Indonesia. *Social Sciences & Humanities Open*, 12, Article 102051. <https://doi.org/10.1016/j.ssaho.2025.102051>
- Suryaningsih, E., Diartika, F., Astanto, T. Y., Wahyuningtiyas, L., & Rambe, S. S. U. (2026). Kajian mekanisme kesesuaian kegiatan pemanfaatan ruang (KKPR) kegiatan berusaha. *SOSMANIORA*, 5(2), 1253–1259. <https://doi.org/10.55123/sosmaniora.v5i2.8276>
- Suwardi, & Randrikasari, O. (2024). Technology for reclaiming post-mining tin lands through the application of soil ameliorant and plant selection: A case study of the Bangka Belitung Islands. *Jurnal Pengelolaan Lingkungan Pertambangan*, 1(1), 29–43. <https://doi.org/10.70191/jplp.v1i1.54894>
- Tahir, M. M., & Nahrudin, Z. (2017). Kapabilitas dynamic governance dalam optimalisasi pengelolaan lahan terbuka hijau di Kota Makassar. *CosmoGov*, 3(1). <https://doi.org/10.24198/cosmogov.v3i1.12404>
- Tiku, D. (2020). Environmental governance dalam penataan ruang terbuka hijau di kawasan pusat pemerintahan Bukit Pelangi Kabupaten Kutai Timur. *JAP: Jurnal Administrasi Publik*, 4(1), 447–459.
- TopBabel. (2026, August 14). Mahasiswa Program Studi Ilmu Politik Universitas Bangka Belitung kaji keluh kesah masyarakat pasca penggalan tanah di kawasan lereng Bukit Siam. <https://topbabel.com/indeks/>
- Van Assche, K., Valentinov, V., & Verschraegen, G. (2022). Adaptive governance: Learning from what organizations do and managing the role they play. *Kybernetes*, 51(5), 1738–1758. <https://doi.org/10.1108/K-11-2020-0759>
- Wialdi, P. F., Putera, R. E., Ariany, R., & Hasymi, E. (2023). The collaboration of Padang City Government in managing Covid-19 disaster through the Dynamic Governance concept. *Spirit Publik: Jurnal Administrasi Publik*. <https://jurnal.uns.ac.id/spirit-publik/article/view/65146>
- Widowati, L., Setyowati, K., & Suharto, D. G. (2023). Dynamic governance as perspective in Indonesian bureaucracy reform. *Jurnal Bina Praja*, 15(2), 403–415. <https://doi.org/10.21787/jbp.15.2023.403-415>
- Worden, S., Svobodova, K., Côte, C., & Bolz, P. (2024). Regional post-mining land use assessment: An interdisciplinary and multi-stakeholder approach. *Resources Policy*, 89, Article 104680. <https://doi.org/10.1016/j.resourpol.2024.104680>
- Yudi. (2025a, October 13). Penggalan lereng Bukit Siam Sungailiat diprotes warga. *Babel Pos*. <https://babelpos.disway.id/bangka/read/679769/penggalan-lereng-bukit-siam-sungailiat-diprotes-warga>
- Yudi. (2025b, October 14). Pemkab Bangka hentikan penggalan tanah di lereng Bukit Siam Sungailiat. *Babel Pos*. <https://babelpos.disway.id/berita-utama/read/679799/pemkab-bangka-hentikan-penggalan-tanah-di-lereng-bukit-siam-sungailiat>