



Reforming Mining Governance in Indonesia's National Strategic Projects: Lessons from Canada and Australia

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ABSTRACT

This study examines mining governance within Indonesia's National Strategic Projects framework by comparing regulatory and institutional practices in Canada and Australia. It addresses the continuing gap between the acceleration of mineral-based development and the protection of environmental, social, and community interests. The research applies normative legal research through comparative and conceptual approaches. Legal materials are analysed using six criteria: institutional architecture, licensing and impact assessment, transparency, public and Indigenous participation, monitoring and enforcement, and mine closure. The findings show that Canada connects impact assessment with Indigenous rights, knowledge, and negotiated project obligations, while Australia combines federal environmental review, state mining authority, native title negotiation, and financial rehabilitation mechanisms. Both systems continue to face jurisdictional fragmentation, power imbalances, and inconsistencies in implementation. Indonesia possesses an extensive regulatory framework, but its effectiveness remains limited by fragmented coordination, formalistic participation, weak data integration, inconsistent enforcement, and inadequate post-mining accountability. This study proposes a contextualised mining governance model based on pre-design sustainability screening, integrated licensing, meaningful participation and benefit-sharing, and independent compliance monitoring. The model rejects direct legal transplantation and instead promotes the functional adaptation of comparative practices to Indonesia's constitutional, administrative, and socio-ecological conditions.

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1. INTRODUCTION

Mineral resources have become central to contemporary industrial and energy policies. The expansion of renewable energy, electric vehicles, battery storage, and digital infrastructure has increased global demand for nickel, lithium, cobalt, copper, graphite, and rare earth elements. This transition creates significant economic opportunities for mineral-producing countries [1]. However, it also intensifies

environmental degradation, land disputes, water pressure, human rights risks, and unequal benefit distribution. Recent studies demonstrate that the sustainability of critical mineral supply depends not only on geological availability and investment capacity but also on governance quality across the entire mining life cycle. Fragmented regulatory regimes may secure mineral supply while transferring environmental and social costs to mining communities. Mining governance must therefore integrate ecological safeguards, public



accountability, community rights, and enforceable corporate obligations into production and industrialisation policies[2].

Indonesia has pursued mineral-based industrialisation through downstreaming policies and the National Strategic Projects framework, officially known as *Proyek Strategis Nasional* (PSN). This framework enables the government to prioritise projects considered essential for economic growth, infrastructure development, employment creation, and national industrial competitiveness. Nevertheless, the administrative privileges attached to PSN may create tension between development acceleration and the procedural safeguards required by environmental and administrative law. Research on PSN governance identifies the extensive use of governmental discretion, limited public scrutiny, risks of corruption, and the exclusion of affected communities from strategic decision-making [3]. In the mining sector, these risks intersect with a nationalist industrial policy that seeks to retain greater economic value from critical minerals through domestic processing. Such a policy can strengthen national industrial capacity, but it may also prioritise investment security and production targets over ecological protection and local rights [4].

The main challenge does not result from the complete absence of mining and environmental regulations. It arises from the uneven capacity of institutions to implement, coordinate, monitor, and enforce those regulations. Research on Indonesian nickel extraction demonstrates that mining expansion has reduced forest cover, while its effects on community welfare remain mixed and spatially unequal [5]. Studies in Central Sulawesi reveal that mining-related disputes often involve land access, employment distribution, environmental damage, and negotiations between companies, governments, and local communities [6]. In Kalimantan, abandoned coal mines and inadequate reclamation have generated prolonged legal and political struggles over environmental responsibility [7]. Indonesia's participation in the Extractive Industries Transparency Initiative has improved formal disclosure arrangements, but transparency reforms have not automatically resolved institutional fragmentation or unequal access to decision-making. Community perceptions surrounding nickel processing also show that environmental commitments stated in impact assessment documents do not always correspond with implementation at the project level [8].

These governance problems become more serious when mining activities form part of PSN. Accelerated projects require decisions concerning business licences, environmental approvals, spatial planning, land acquisition, infrastructure, and community protection within a compressed administrative process. Weak coordination can produce conflicting decisions between central agencies, regional governments, environmental authorities, and land administration bodies [9]. Limited access to project information can also prevent affected communities from raising objections before essential decisions become difficult to reverse. The designation of a project as nationally strategic must therefore not reduce environmental assessment to an administrative requirement that merely confirms a prior political decision. It should establish stronger public justification because the project receives exceptional state support and may create extensive

socio-ecological consequences. The critical question concerns how Indonesia can maintain development effectiveness without weakening legality, participation, environmental integrity, and administrative [10].

Canada provides a relevant comparative reference because its mining governance combines federal and provincial authority with impact assessment and Indigenous participation mechanisms. Scholarship concerning the Canadian Impact Assessment Act shows an effort to integrate environmental, social, economic, health, and Indigenous knowledge considerations into project evaluation [8]. The legal framework recognises that project assessment must consider more than measurable biophysical effects. It must also examine cultural relationships, community knowledge, and the implications of development for Indigenous rights. However, research on Canadian resource development identifies continuing ambiguity in the relationship between legally mandated consultation and voluntary corporate arrangements. Consultation can expand participation, but it does not always ensure that Indigenous communities influence final decisions. Recent scholarship therefore examines equity participation and Indigenous co-ownership as mechanisms that may move community involvement beyond consultation toward economic and institutional participation [11]. Canada offers useful governance functions, but its experience also demonstrates the limits of treating consultation as sufficient protection.

Australia presents another multilevel governance model in which federal environmental regulation interacts with state mining authority and Indigenous land rights. Mining and critical mineral projects frequently intersect with land subject to Aboriginal and Torres Strait Islander rights and interests. A national mapping study shows that a substantial proportion of Australian critical mineral projects are located on or near land where Indigenous Peoples possess recognised or asserted rights. This intersection makes Indigenous participation, cultural heritage protection, benefit-sharing, and negotiated land-use arrangements essential components of mining governance. At the federal level, the Environment Protection and Biodiversity Conservation Act establishes an assessment framework for activities that may significantly affect matters of national environmental significance. Legal scholarship nevertheless identifies weaknesses in its institutional design, including fragmented jurisdiction, extensive administrative discretion, and an emphasis on procedural assessment rather than guaranteed environmental outcomes [12]. Australia is therefore relevant not because it has eliminated mining conflicts, but because it provides institutional experience in connecting environmental assessment, multilevel authority, and Indigenous land arrangements.

The reference to "international standards" in this study denotes a defined set of governance benchmarks rather than an abstract claim about global best practices. The first benchmark concerns transparency in licensing, corporate ownership, contractual arrangements, state revenues, and environmental obligations. Research on the Extractive Industries Transparency Initiative shows that disclosure can improve governance only when domestic institutions possess the capacity and political commitment to use the disclosed information [8]. The second benchmark concerns human



rights due diligence, which requires governments, investors, and corporations to identify and prevent adverse impacts rather than respond only after harm occurs[13]. The third benchmark concerns free, prior, and informed consultation or consent for decisions affecting Indigenous Peoples and their territories. Political economy research warns that prior consultation may become a legitimating procedure when communities lack bargaining power or when governments predetermine project approval[14]. The fourth benchmark concerns environmental certification and sectoral guidelines that integrate water protection, impact management, monitoring, and corporate accountability[15].

These standards provide a common analytical framework for comparing Canada, Australia, and Indonesia. They do not require Indonesia to reproduce foreign regulatory institutions in identical forms. Transparency mechanisms will remain ineffective when licensing data are fragmented or inaccessible. Consultation will remain formalistic when project information becomes available only after essential decisions have been made. Environmental assessment will lose its preventive function when authorities treat project approval as inevitable because of its strategic status. Similarly, benefit-sharing arrangements will not protect affected communities without enforceable commitments, representative negotiation, and accessible dispute-resolution mechanisms. Comparative legal analysis must therefore distinguish between adopting the visible form of foreign regulation and reproducing the institutional conditions that allow the regulation to operate. The comparison should identify governance functions, implementation requirements, and legal safeguards that remain compatible with Indonesia's constitutional, administrative, and socio-ecological context.

Existing studies offer valuable findings, but they remain divided by jurisdiction and governance issue. Indonesian scholarship has examined PSN-related discretion, exclusionary development, nickel industrialisation, environmental degradation, transparency, community conflict, and reclamation failures [3], [9]. Canadian studies primarily discuss impact assessment, Indigenous knowledge, consultation, and participation in resource development [8], [11]. Australian studies focus on federal environmental assessment, Indigenous land rights, and the geographical intersection between critical minerals and Indigenous territories [12]. This literature does not yet provide an integrated comparison of the three countries through identical legal and governance criteria. It also does not adequately connect comparative mining governance with the exceptional administrative characteristics of Indonesian PSN. As a result, existing studies provide limited guidance on which foreign mechanisms Indonesia should adopt, which mechanisms require substantial modification, and which institutional conditions determine their effectiveness.

Institutional isomorphism provides a conceptual basis for analysing this problem. The theory explains why organisations and governments may adopt similar rules or structures because of regulatory pressure, professional expectations, uncertainty, or the perceived legitimacy of established models [16]. Legal arrangements transferred between jurisdictions may nevertheless produce different outcomes because receiving systems reinterpret them through their own institutions,

political structures, and legal cultures. Teubner describes this process as the creation of "legal irritants," in which imported legal concepts trigger new and sometimes unintended institutional developments rather than producing uniformity [17]. Policy-transfer research also distinguishes substantive learning from policy churn, where governments repeatedly copy institutional forms without securing effective implementation [18]. In mining governance, the formal adoption of sustainability reporting, public consultation, environmental assessment, or transparency obligations cannot guarantee equivalent outcomes without regulatory capacity, administrative integrity, reliable data, community bargaining power, and effective enforcement.

Against this background, this study compares mining governance in Canada, Australia, and Indonesia through six criteria: legal and institutional architecture; licensing and impact assessment; transparency and access to information; public and Indigenous participation; monitoring and law enforcement; and alignment with international sustainability standards. It addresses three questions. First, how do the three countries differ in the normative design and institutional operation of mining governance? Second, which Canadian and Australian mechanisms are functionally relevant to mining-related PSN in Indonesia? Third, how should those mechanisms be adapted to Indonesia's legal and administrative conditions? This study proposes a contextualised governance model based on pre-design sustainability screening, integrated licensing, meaningful participation, equitable benefit-sharing, and independent compliance monitoring. Its contribution lies in developing a framework for selective and context-sensitive legal reform rather than recommending the wholesale transplantation of foreign institutions.

2. RESEARCH METHODS

This study employs normative legal research with comparative and conceptual approaches. Normative legal research was selected because the study examines the structure, coherence, and institutional implications of legal norms governing mining, environmental assessment, public participation, Indigenous rights, transparency, and law enforcement. The comparative approach does not merely place the laws of different jurisdictions side by side. It identifies how each legal system performs similar governance functions and explains why comparable regulatory instruments may produce different institutional outcomes. Comparative legal research requires common criteria, transparent jurisdictional selection, and careful consideration of the political and institutional contexts in which legal rules operate [19]. The conceptual approach is used to examine institutional isomorphism, legal transplantation, meaningful participation, sustainable mining governance, and context-sensitive policy adaptation.

Canada and Australia were selected purposively rather than on the assumption that their legal systems are identical to Indonesia. Both countries possess extensive mining sectors, multilevel regulatory structures, environmental impact assessment mechanisms, and legal arrangements concerning Indigenous participation in natural resource projects. These characteristics make them relevant functional comparators for



evaluating the weaknesses and reform needs of mining-related PSN governance in Indonesia. Canada provides a reference for integrated impact assessment, Indigenous consultation, and community benefit arrangements. Australia provides a reference for federal-state coordination, environmental approval, public consultation, and the interaction between mining activities and Indigenous land rights. Indonesia functions as the receiving jurisdiction whose legal and institutional conditions determine whether particular foreign mechanisms can be adapted. This purposive selection follows the principle that comparative cases must correspond to the research question and permit an explanation of both similarities and differences [20].

The legal materials comprise primary and secondary sources. Primary legal materials include legislation, subordinate regulations, environmental assessment frameworks, mining governance instruments, and relevant policy arrangements from Canada, Australia, and Indonesia. Secondary materials consist of peer-reviewed journal articles addressing mining regulation, environmental governance, public participation, Indigenous rights, regulatory enforcement, institutional capacity, and comparative legal methodology. The materials were collected through document-based legal research and organised in a comparative matrix using six criteria: legal and institutional architecture; licensing and impact assessment; transparency and access to information; public and Indigenous participation; monitoring and law enforcement; and alignment with international sustainability standards. Applying identical criteria prevents the comparison from becoming an unsystematic description of separate national systems.

The analysis proceeded through four stages. First, the study identified and classified the legal rules and institutional arrangements applicable to mining governance in each jurisdiction. Second, it applied qualitative content analysis to determine the objectives, procedures, responsible institutions, participation mechanisms, and enforcement consequences contained in those arrangements. Third, it conducted a functional comparison to assess how each jurisdiction addresses similar governance problems through different legal and institutional mechanisms. A functional comparison is useful for identifying common regulatory problems and evaluating alternative legal solutions, but it must remain sensitive to social, administrative, and political context [21]. Fourth, the comparative findings were evaluated through the concepts of institutional isomorphism and legal transplantation to distinguish substantive policy learning from the formal imitation of foreign institutions.

The research adopts a qualitative-prescriptive orientation. It does not seek to calculate the statistical effectiveness of mining policies or establish direct causal relationships between particular regulations and socio-environmental outcomes. Claims concerning implementation are therefore supported by peer-reviewed empirical studies rather than interviews or field observations conducted by the authors. The prescriptive analysis evaluates which Canadian and Australian mechanisms are legally relevant, institutionally feasible, and normatively compatible with Indonesia's constitutional and administrative system. This process produces a contextualised reform model for mining-related

PSN based on early sustainability screening, integrated licensing, meaningful participation, equitable benefit-sharing, transparent monitoring, and enforceable compliance mechanisms.

3. DISCUSSIONS

3.1 Comparative Mining Governance Frameworks in Canada, Australia, and Indonesia

Mining governance in Canada, Australia, and Indonesia reflects different constitutional structures, administrative capacities, relationships with affected communities, and development priorities. The comparison cannot rest on the number of regulations adopted by each country. It must assess whether the regulatory system connects project assessment, licensing, public participation, information disclosure, operational monitoring, enforcement, and mine closure within an accountable decision-making process. Canada and Australia provide relevant comparators because both operate major mining industries through multilevel governmental structures and have developed specific mechanisms for environmental assessment and Indigenous participation. Neither jurisdiction offers a flawless model. Their value lies in the institutional functions they perform, the limitations revealed by their implementation, and the lessons those experiences provide for Indonesia [22].

Canada distributes mining governance among federal, provincial, territorial, and Indigenous institutions. Provinces and territories hold substantial authority over mineral development, land administration, operational licensing, and rehabilitation, while federal institutions exercise authority over matters such as fisheries, transboundary impacts, federal lands, and Indigenous rights. This arrangement allows regulation to respond to regional conditions, but it also creates multiple assessment procedures and variations in data accessibility, institutional responsibility, and regulatory standards. Research on Canadian mine and quarry assessments identifies a broad network of applicable impact assessment laws and substantial differences in the availability of project information across jurisdictions [23]. The development of Canada's critical minerals industry has further strengthened the interaction between national and subnational policy. Federal, provincial, territorial, and First Nations instruments may reinforce each other, but overlapping strategies can also create coordination problems when the institutions involved use different priorities and implementation mechanisms [22].

Canadian impact assessment has gradually expanded beyond the measurement of direct biophysical effects. It now provides greater space for sustainability considerations, cumulative impacts, Indigenous knowledge, cultural interests, and the effects of proposed projects on Indigenous rights. This development positions Indigenous communities as rights holders rather than ordinary stakeholders. However, formal recognition does not automatically produce equal participation. Indigenous communities still face unequal access to technical expertise, financial resources, baseline data, and decision-making authority [24]. Negotiated mechanisms such as Impact and Benefit Agreements can regulate employment, procurement, compensation, cultural



protection, environmental monitoring, and dispute settlement throughout the life of a mining project. Their effectiveness nevertheless depends on bargaining capacity, transparency, enforceability, and the relationship between private agreements and public regulation [25]. Canada therefore demonstrates the value of early rights-based participation while showing that consultation can remain procedural when communities cannot influence final project design.

Australia also applies a multilevel governance system. State and territory governments primarily regulate mineral titles, mining licences, royalties, land access, rehabilitation, and operational supervision. Federal environmental review applies when mining activities may affect matters protected at the national level. The interaction between legal approval, social acceptance, and economic viability shapes project outcomes. An empirical study of 409 federally reviewed Australian mining applications found that mine characteristics, competing land uses, organised opposition, political conditions, and commodity prices affected review duration, approval conditions, and project withdrawal [26]. The finding indicates that public mobilisation can affect regulatory scrutiny, although additional conditions do not necessarily prevent project approval. Australian governance therefore provides structured assessment and public comment procedures, but the protective effect of those procedures depends on the quality of approval conditions, independent supervision, and effective post-approval enforcement.

Australia's critical minerals strategy also reveals a tension between industrial upgrading and socio-environmental protection. Governments have promoted project financing, infrastructure support, processing capacity, and approval acceleration to strengthen Australia's position in global mineral supply chains. These policies have not always produced equivalent improvements in environmental outcomes, community protection, or First Nations' rights [27]. This concern carries particular significance because many critical mineral projects intersect with land subject to recognised or asserted Indigenous rights. Research shows that 57.8 per cent of identified Australian critical mineral projects are located in areas where Indigenous Peoples possess a formal right to negotiate. The figure rises to 79.2 per cent when pending native title claims are included. Australia has also developed financial assurance and mine rehabilitation requirements, but closure regulation remains fragmented, partly contradictory, and insufficiently attentive to long-term social transition [28]. Its experience confirms that sophisticated approval procedures must connect with Indigenous negotiation, progressive rehabilitation, financial guarantees, and post-mining accountability.

Indonesia possesses an extensive legal framework for mineral licensing, environmental approval, reclamation, post-mining obligations, spatial planning, and administrative supervision. Recent reforms have transferred substantial licensing authority from regional governments to the central government. Centralisation seeks to improve standardisation, reduce irregular regional permits, and support the national mineral downstream agenda. It has not removed the sector's institutional fragmentation. Mining decisions still intersect with environmental administration, forestry, land affairs, coastal management, spatial planning, regional

development, and supporting infrastructure. These functions remain distributed across institutions with different databases, procedural priorities, and enforcement capacities. Research on Indonesian nickel governance shows that national industrial policies can generate unintended consequences when the government does not adequately coordinate large-scale mining, small-scale extraction, smelting industries, land relations, and local economic interests [29]. Centralisation may therefore transfer administrative problems to the national level rather than solve their underlying causes.

The PSN framework intensifies this problem because it links mining and mineral-processing projects with accelerated planning, land acquisition, licensing, infrastructure provision, and investment facilitation. Strategic status gives projects stronger political and administrative support, but it may also create pressure to resolve legal and environmental concerns in favour of project continuity. Research on PSN governance identifies risks related to broad administrative discretion, insufficient public scrutiny, and the exclusion of affected communities from early decision-making [4]. In the mining context, these risks extend beyond the construction stage. Mining projects generate long-term consequences for water systems, forests, community livelihoods, labour migration, waste storage, public health, and post-mining landscapes. The strategic designation of a project should therefore increase the government's burden of justification. It should not convert environmental approval, spatial conformity, or public consultation into instruments that merely legitimise a predetermined project.

Environmental assessment illustrates the gap between formal regulation and operational governance. Indonesian law requires AMDAL for activities that may produce significant environmental impacts and provides space for affected communities to participate. The central problem concerns the continuity between impact assessment, environmental approval, project implementation, monitoring, and administrative correction. Research on a nickel smelter in Indonesia found that community perceptions provided relevant evidence for evaluating whether environmental and social programmes listed in impact assessment documents had been implemented [9]. Communities reported different outcomes across environmental, economic, and social dimensions. These findings show that the approval of an AMDAL document cannot serve as proof of effective environmental management. Authorities must connect assessment documents with measurable permit conditions, accessible monitoring data, periodic evaluation, community complaints, and enforceable corrective orders. Otherwise, AMDAL operates as a one-time licensing requirement rather than a preventive and continuing governance instrument.

The same implementation gap appears in transparency and participation. Indonesia's involvement in the Extractive Industries Transparency Initiative expanded disclosure and civil society participation, but the initiative produced limited effects on broader institutional accountability and the environmental and social consequences of extraction. Disclosure loses its regulatory function when data remain fragmented, technically inaccessible, or disconnected from licensing and enforcement. Effective mining transparency should enable the public to identify permit holders, beneficial



owners, concession boundaries, environmental commitments, state revenues, reclamation guarantees, inspection findings, and sanctions. Participation must also begin before the government and investors finalise the location and design of a project. Evidence from Central Sulawesi shows that conflicts over land, employment, environmental damage, and benefit distribution can lead communities to use collective resistance as a method of negotiation [6]. Such resistance often reflects the absence of trusted procedures for influencing decisions before socio-environmental harm occurs.

Enforcement and post-mining accountability expose the most serious consequences of fragmented governance. Legal struggles over abandoned coal mines in Kalimantan reveal persistent problems involving incomplete reclamation, environmental hazards, unclear institutional responsibility, and limited access to effective remedies. Similar concerns appear in Indonesia's rapidly expanding nickel sector. A large-scale study of 7,721 villages in Sulawesi found that deforestation in nickel-mining villages nearly doubled during the period examined. Improvements in infrastructure and living standards did not offset declining environmental well-being across the wider assessment period [5]. These findings challenge the use of investment realisation, production growth, or downstream capacity as the principal measures of regulatory success. Mining governance must also evaluate ecological change, distributional outcomes, community protection, corporate compliance, and the state's capacity to secure restoration after extraction ends.

The comparison can be consolidated through seven criteria that represent the full mining project cycle. These criteria include regulatory structure, impact assessment, community position, transparency, enforcement, mine closure, and the principal implementation weakness. Table 1 does not classify Canada or Australia as universally superior systems. It identifies the institutional functions that operate more clearly in those countries and the implementation gaps that remain relevant to Indonesian legal reform.

Table 1. Comparative Matrix of Mining Governance in Canada, Australia, and Indonesia

Criterion	Canada	Australia	Indonesia
Regulatory structure	Shared federal, provincial, territorial, and Indigenous authority	Federal environmental review with state mining authority	Centralised mining authority with fragmented sectoral coordination
Impact assessment	Covers environmental, social, cultural, cumulative, and Indigenous-rights impacts	Layered assessment with public review and project conditions	AMDAL exists, but follow-up and integration remain weak
Community position	Indigenous Peoples recognised as rights holders	Native title supports negotiation rights	Communities mostly treated as affected participants
Transparency	Public records available, but uneven across jurisdictions	Formal disclosure through environmental review	Data disclosure remains fragmented and difficult to use

Monitoring and enforcement	Multilevel supervision and project conditions	Inspection, financial assurance, and legal review	Weak capacity and inconsistent sanctions
Rehabilitation and closure	Closure duties vary across provinces and territories	Financial assurance exists, but rules remain fragmented	Reclamation duties exist, but abandoned sites persist
Main weakness	Jurisdictional complexity and unequal Indigenous capacity	Industrial acceleration exceeds social and ecological safeguards	Weak integration of licensing, participation, enforcement, and closure

Source: Authors' comparative synthesis of the literature.

The table above shows that the main distinction does not concern the presence or absence of mining regulation. All three countries regulate project assessment, community engagement, operational compliance, and mine closure. The difference lies in the institutional connection between those components. Canada links impact assessment more directly with Indigenous rights, knowledge, and negotiated project obligations, although unequal capacity can restrict the substance of participation. Australia connects federal environmental assessment with state mining regulation and native title negotiation, but its industrial strategy has moved faster than its environmental and social safeguards. Indonesia regulates each component through separate legal instruments, yet it has not fully integrated them into one traceable decision-making sequence. This fragmentation allows a project to satisfy formal licensing requirements while unresolved land, environmental, participation, and reclamation issues continue outside the principal approval process.

The comparative lesson is therefore functional rather than imitative. Indonesia does not need to reproduce Canada's federal structure, private agreement system, or Australia's native title framework. It should adapt the functions performed by those mechanisms. Environmental and social assessment must occur before a mining project receives an irreversible strategic commitment. Affected communities must receive early information, resources for independent assessment, a reasoned response to objections, and enforceable benefit arrangements. Mining, environmental, land, and spatial data must support integrated oversight. Reclamation guarantees must reflect realistic closure costs, while monitoring must continue throughout the operational and post-mining stages.

3.2 Implications for National Strategic Projects and the Direction of Indonesian Mining Law Reform

The comparative findings show that reforming mining governance within the National Strategic Projects framework requires more than adding new licences, reporting duties, or sustainability clauses. Indonesia must connect project designation, environmental assessment, spatial planning, land administration, community participation, operational supervision, and mine closure within one accountable regulatory sequence. Mining governance involves public institutions, corporations, affected communities, and environmental systems whose interests extend beyond the



issuance of a business permit [30]. The PSN regime currently prioritises administrative acceleration and project completion, while its safeguards do not always provide an equivalent level of environmental and social scrutiny. Legal reform should therefore change the meaning of acceleration. It should shorten avoidable bureaucratic delay without reducing scientific examination, public participation, or access to administrative remedies. Strategic status must increase the state's duty to justify a project because PSN receives exceptional institutional support and can produce extensive, long-term impacts.

The first reform concerns the stage at which a mining or mineral-processing project enters the PSN framework. The government should conduct a pre-design sustainability screening before granting strategic status. This screening should assess land tenure, spatial suitability, water availability, biodiversity, cumulative pollution, public health, community vulnerability, disaster risk, Indigenous or customary territorial claims, and projected closure costs. It must also compare alternative locations, technologies, production scales, and the option of not proceeding. Existing spatial and environmental reforms have often placed investment facilitation ahead of sustainability, while many regions still lack detailed spatial plans that can support reliable project decisions [31]. Evidence from nickel-producing areas also shows that economic and infrastructure gains may coexist with forest loss and declining environmental well-being. Early screening would prevent PSN designation from becoming a political commitment that predetermines the outcome of later environmental assessment.

The second reform requires an integrated licensing architecture. Integration should not mean replacing several substantive approvals with a single permit controlled by one institution. Such simplification could weaken environmental, spatial, forestry, land, and coastal safeguards. Integration should instead connect the relevant decisions through common data, fixed institutional responsibilities, coordinated schedules, and traceable reasons. Each authority must retain responsibility for the legal interests within its mandate, but all authorities should assess the same project data and disclose how their decisions relate to one another. Research on integrated business licensing and spatial planning in Indonesia identifies sectoral interests, uneven institutional capacity, and weak inter-agency coordination as persistent barriers [32]. Stakeholder analysis also places environmental regulation, permitting, transparency, and accountability among the core priorities for improving Indonesian mining governance [33]. A PSN mining coordination mechanism should therefore clarify which institution leads, reviews, monitors, and corrects each stage of the project.

This integrated system must preserve the substantive role of environmental impact assessment. AMDAL should test project feasibility rather than confirm a development choice already settled through PSN designation. Its analysis should contain reliable baseline data, cumulative impact assessment, technological alternatives, climate and disaster risks, restoration scenarios, and measurable environmental limits. Independent experts should review high-risk mining assessments, particularly where project proponents and affected communities present conflicting scientific evidence. Indonesian environmental litigation increasingly examines omitted impacts, data validity, methodological choices, and

the feasibility of proposed mitigation measures [34]. This development confirms that environmental disputes do not concern procedure alone. They also concern the scientific quality and value judgments embedded in assessment documents. Research on environmental assessment practice further shows that technical intermediaries often emphasise distributive and procedural justice while giving less attention to the recognition of minority identities and values [35]. AMDAL reform must therefore combine scientific integrity with environmental justice.

The environmental approval should also establish a continuing compliance framework. Every commitment contained in an AMDAL, environmental management plan, or community-development programme should become a measurable permit condition. The conditions must identify responsible actors, performance indicators, reporting intervals, verification methods, corrective measures, and sanctions. A study of a nickel smelter in Indonesia found that affected communities provided important evidence for evaluating whether programmes stated in environmental assessment documents had been implemented [9]. This evidence supports a community-based monitoring mechanism that operates alongside official inspection. The government should publish monitoring results in an accessible format and require companies to explain deviations from approved commitments. Where monitoring identifies new or underestimated impacts, the regulator should possess authority to revise operational conditions, order additional mitigation, suspend activities, or reconsider the permit. This adaptive approach would transform AMDAL from a one-time administrative document into an instrument that governs environmental performance throughout the mining life cycle.

The third reform concerns meaningful public participation. Participation should begin when the government identifies potential PSN locations and development alternatives, not after the project proponent has secured political support, financing, and principal approval. Affected communities require timely access to project maps, impact predictions, water and waste plans, land requirements, benefit proposals, and closure scenarios. They should also receive adequate time and independent assistance to assess that information. Empirical research identifies power imbalances and information asymmetry as major obstacles to community influence in mining decisions [36]. Prior consultation may also lose its democratic function when state and corporate actors control its agenda, information, and permissible outcomes [40]. Indonesian reform should therefore require authorities to document community objections, provide reasoned responses, explain how participation changed the project, and state why rejected proposals could not be accommodated. Attendance records alone cannot demonstrate meaningful participation.

A rights-based approach is particularly necessary where mining-related PSN affects Indigenous Peoples or customary communities. The government must first recognise the community, its representative institutions, and its territorial relationship before consultation begins. Administrative uncertainty concerning formal recognition should not justify excluding communities from decisions that may permanently alter their land and livelihoods. The Canadian and Australian experiences suggest that Indonesia should adapt the functions



of rights-holder consultation, negotiated agreements, and Indigenous participation without copying their institutional forms. Community agreements may regulate compensation, employment, procurement, environmental monitoring, cultural protection, revenue distribution, and dispute settlement. However, private negotiation cannot replace the state's public-law obligations. Research on resource development warns that voluntary arrangements can create uncertainty over governmental and corporate responsibilities. Co-ownership or equity participation can strengthen community influence, but it also requires independent advice, transparent risk allocation, and protection against unequal bargaining [11].

Benefit-sharing should consequently form part of the legal architecture of PSN rather than depend solely on corporate social responsibility. The distribution of benefits must correspond to the duration, scale, and risks of mining activities. One-off compensation cannot address long-term changes in access to land, water, employment, food systems, cultural practices, and local economic structures. Legally enforceable arrangements should cover local procurement, employment and training, community infrastructure, revenue-sharing, restoration funds, and livelihood transition. They should identify eligible communities, representative procedures, financial management rules, audit requirements, and dispute-resolution mechanisms. The arrangement must not purchase consent or restrict communities from reporting environmental violations. Research on mining participation shows that company-designed engagement can reproduce disputes over representation, information, and power when communities lack control over the process [37]. Benefit-sharing must therefore complement effective participation and environmental protection. It cannot serve as compensation for defective assessment or unlawful project approval.

The fourth reform involves transparency and data integration. Indonesia needs a public mining governance platform that links concession boundaries, beneficial ownership, licence status, environmental approvals, spatial conformity, land claims, production data, state revenues, reclamation guarantees, inspection findings, community complaints, and sanctions. Each dataset should use compatible project identifiers so regulators and the public can trace a project from planning to closure. Indonesia's experience with extractive-sector transparency shows that disclosure standards can expand access to information but do not automatically strengthen institutional accountability or improve socio-environmental outcomes [10]. Transparency must therefore connect information with review and correction procedures. Citizens should be able to challenge inaccurate records, report non-compliance, and request administrative action. Regulators must explain their response within a fixed period. This structure would convert disclosure from a reporting exercise into a mechanism of public oversight and institutional accountability.

The fifth reform requires independent and risk-based compliance monitoring. The institution that promotes or coordinates a PSN should not hold exclusive responsibility for evaluating its environmental and social performance. Indonesia should establish a monitoring arrangement that combines sectoral inspections, independent scientific audits,

community reports, remote sensing, and publicly accessible performance indicators. Inspection frequency should reflect the scale of environmental risk, compliance history, proximity to settlements, and potential for irreversible harm. Regulators should apply graduated sanctions, including corrective orders, administrative fines, production restrictions, licence suspension, restoration orders, and revocation. Serious or repeated violations should trigger civil or criminal enforcement. Research on illegal mining in Indonesia identifies weaknesses in regulatory coordination, enforcement capacity, and institutional commitment as key obstacles to effective legal protection [38]. Strong statutory sanctions will remain ineffective when authorities lack verified data, operational resources, and insulation from political or commercial pressure.

Reclamation and mine closure must also become central elements of PSN planning. The government should require a credible closure plan before granting strategic status or operational approval. This plan should calculate ecological restoration costs, define progressive rehabilitation targets, secure financial guarantees, and prepare workers and communities for economic transition. Authorities must periodically update the financial guarantee to reflect inflation, operational changes, and new environmental information. Companies should not recover the guarantee until an independent assessment confirms ecological stability and compliance with agreed post-mining land uses. Indonesian studies show that post-mining sustainability requires integrated governance that evaluates economic, social, environmental, and institutional performance rather than relying on physical reclamation indicators alone [39]. Closure governance must also address community livelihoods, local revenue decline, water safety, long-term maintenance, and responsibility for latent environmental damage.

International sustainability standards can support these reforms, but Indonesia should not incorporate them through simple legal imitation. Institutional isomorphism explains why governments adopt recognised regulatory forms to gain legitimacy, respond to uncertainty, or align themselves with professional and market expectations [16]. Legal transplantation may nevertheless create different outcomes because receiving institutions interpret and enforce imported rules through their own legal culture, administrative capacity, and political economy [17]. Policy transfer can also produce repeated institutional change without effective learning when governments copy visible structures but neglect the conditions required for implementation [18]. Indonesia should therefore translate foreign and international mechanisms into domestic legal functions. Disclosure standards must connect with public remedies. Consultation must influence project design. Sustainability reporting must use verifiable indicators. Benefit agreements must carry enforceable obligations. Environmental audits must lead to regulatory correction. This functional approach would prevent international standards from becoming symbolic evidence of compliance.

Based on these elements, Indonesian mining law reform should construct a contextualised PSN mining governance model with four connected pillars. The first pillar is pre-design sustainability screening before strategic designation. The second is integrated licensing and institutional coordination



based on interoperable data and a clear division of responsibility. The third is meaningful participation supported by rights recognition, independent community assistance, and enforceable benefit-sharing. The fourth is independent compliance monitoring that extends through operations, reclamation, closure, and post-mining transition. These pillars should operate as one regulatory cycle rather than separate programmes. Their integration would preserve the developmental purpose of PSN while subjecting mining acceleration to legality, ecological limits, social legitimacy, and long-term accountability. Reform would then move beyond the formal adoption of Canadian or Australian mechanisms and build an Indonesian governance structure suited to its constitutional framework and socio-ecological conditions.

4. CONCLUSIONS

This study finds that the main weakness of mining governance within Indonesia's National Strategic Projects framework does not arise from a lack of regulation, but from the weak integration of project designation, licensing, environmental assessment, spatial planning, public participation, monitoring, enforcement, and mine closure. Canada demonstrates the value of comprehensive impact assessment, rights-based Indigenous participation, and enforceable benefit arrangements, although jurisdictional complexity and unequal community capacity remain significant limitations. Australia provides lessons on layered environmental review, native title negotiation, financial assurance, and rehabilitation governance, but industrial acceleration has not always been matched by equivalent environmental and social safeguards. These experiences cannot be transferred mechanically into Indonesian law. Mining law reform should instead adopt their regulatory functions through a contextualised governance model based on pre-design sustainability screening, integrated and traceable licensing, meaningful participation supported by rights recognition and benefit-sharing, and independent compliance monitoring throughout the mining life cycle. Under this model, PSN status should increase the state's obligation to justify, supervise, and correct mining projects rather than reduce substantive safeguards in the name of acceleration. Such reform would align mineral-based development with legal certainty, environmental integrity, social legitimacy, and long-term public accountability.

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