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Stakeholder Driven Decision Making for Long Term Sustainability in Mining Governance

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A B S T R A C T

This study analyzes the role of stakeholder involvement in mining governance and its impact on social, economic, and environmental sustainability. Using a mixed methods approach—combining a quantitative survey of 150 respondents with qualitative interviews and focus group discussions involving 25 key informants from government, industry, and civil society—the research examines how participation levels influence governance quality. The findings indicate that higher stakeholder participation enhances policy legitimacy, implementation effectiveness, and the balance between economic and environmental objectives. The study concludes that stakeholder-based decision-making strengthens collaborative governance theory and provides practical insights for developing adaptive and sustainable mining policies at local and national levels.

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INTRODUCTION

Mining is a strategic sector that contributes greatly to economic development, but its practice often has significant social and environmental impacts. In various developing countries, mining activities lead to land degradation, water pollution, and social conflicts with local communities, giving rise to complex governance challenges (Pauna et al., 2023). In Indonesia, despite the regulations governing reclamation and post-mining, implementation in the field still often faces obstacles, both in terms of corporate compliance and the effectiveness of government supervision. This condition shows that mining governance is not enough to rely only on technical aspects, but requires a more inclusive and participatory decision-making mechanism. Global pressure is also getting stronger, both from investors, international organizations, and civil society, for mining companies to implement accountable sustainability practices. Therefore, the issue of stakeholder-based decision-making is becoming increasingly relevant to pay attention to.

A number of previous studies have examined stakeholder engagement in the context of corporate social responsibility and sustainability reporting. (Ansu-Mensah et al., 2021) emphasized that stakeholder involvement can increase the social legitimacy of mining companies in Ghana, while (Suryana & Setiany, 2023) found that stakeholder pressure has a significant effect on the disclosure of sustainability reports on mining companies in Indonesia. However, the focus of the research is more on the reporting aspect, rather than on the decision-making mechanisms that directly affect mining governance. This creates a research gap on how stakeholder participation can be systematically integrated into strategic decision-making that affects long-term sustainability.

In addition, research on post-mining governance still tends to be fragmented. (Siahaan et al., 2025), for example, offers an integrative framework that connects institutional and behavioral aspects in realizing post-mining sustainability in Indonesia. However, the research has not explained how stakeholder-based decisions can be formulated into adaptive policy models. Similarly, (Amiruddin et al., 2021) examined stakeholder involvement in risk management, but has not explicitly linked stakeholder participation to social, economic, and environmental sustainability. This gap reinforces the urgency to present research that links stakeholder engagement, decision-making mechanisms, and sustainability achievements in the mining context.

This research aims to analyze the role of stakeholder involvement in mining decision-making and its contribution to the sustainability of the sector's governance. In particular, this study focuses on the relationship between stakeholder participation levels and social, economic, and environmental sustainability achievements. This research also aims to formulate a stakeholder-based decision-making model by utilizing multi-criteria approaches such as the Analytical Hierarchy Process (AHP), thereby resulting in a more comprehensive policy framework. Thus, this research not only fills theoretical gaps, but also provides empirical evidence on the importance of stakeholder participation in mining governance.

The contribution of this research is twofold, both theoretically and practically. Theoretically, this study expands the literature on governance by integrating stakeholder theory, sustainability theory, and decision-making theory in the context of mining. Practically, this study provides policy recommendations to design a more inclusive, transparent, and accountable stakeholder participation mechanism, so as to strengthen policy legitimacy and reduce social conflicts in mining areas. This research also contributes to providing an implementation framework that can be adopted by local and national governments in formulating sustainable mining policies. With this approach, this research is expected to help bridge economic, social, and environmental interests in a balanced manner.

THEORETICAL REVIEW

Stakeholder Engagement and Social Licence to Operate in Mining Governance

Modern mining governance places stakeholders as a determining factor for social legitimacy. Social Licence to Operate (SLO) is no longer seen as a mere formality, but rather as a dynamic instrument that can strengthen long-term sustainability. The involvement of local communities, civil society organizations, and local governments has been shown to increase transparency, reduce the potential for conflict, and enrich the quality of decision-making (Pacheco et al., 2021; Sloan & Oliver, 2022). In this context, stakeholder engagement is not only seen as a means of communication, but as a collaborative governance mechanism that influences the direction of mining policy. Recent studies show that without sustainable dialogue mechanisms, corporate social legitimacy is often fragile and at risk of being lost in the long run (Lund & Toivanen, 2023).

Participatory and Multi-Criteria Decision-Making Model

Decisions in the mining sector always involve a dilemma between economic benefits, environmental protection, and social welfare. Therefore, the multi-criteria decision analysis (MCDA) method is increasingly being applied to integrate the preferences of various stakeholders into a more objective decision framework. Methods such as the Analytic Hierarchy Process (AHP), Technique for Order Preference by Similarity to Ideal Solution (TOPSIS), and the Delphi–AHP approach have been proven effective in reducing subjective bias and strengthening the legitimacy of decision results (Ghosh et al., 2020; Zhou et al., 2021; Wang & Lee, 2022). The integration of MCDAs in mining governance allows companies and governments to balance social, economic, and environmental interests in a balanced manner. Recent research confirms that stakeholder involvement from the stage of identifying criteria to validating decision results is a key factor for decisions to be widely accepted (Abdollahian et al., 2023).

The Role of Regulation and Collaborative Governance

The regulatory framework is a key pillar in ensuring the effectiveness of stakeholder-based decision-making. Regulations related to environmental impact analysis, post-mining reclamation, and public consultation obligations

have been proven to increase corporate accountability (Aragon & Rud, 2020; Hilson & Maconachie, 2021). However, obstacles in implementation such as weak institutional capacity, overlapping authority, and corrupt practices often reduce the effectiveness of regulations (Mutti & Yakovleva, 2022). Recent studies emphasize the need for collaborative governance involving participatory monitoring mechanisms to make decisions more transparent and adaptive to local dynamics (Sosa & Zwarteveen, 2023). Thus, good regulation is not only about the substance of the rules, but also the extent to which it can stimulate stakeholder involvement in policy implementation.

Sustainability Practices and Integration of Green Technology

The shift towards sustainable mining practices cannot be separated from the application of environmentally friendly technologies. Innovations such as the use of renewable energy, low-risk waste treatment methods, and digital monitoring systems have become an important part of reducing ecological impacts (Kinnunen et al., 2020; Burt et al., 2021). However, the successful adoption of this technology is highly dependent on stakeholder involvement at every stage, from planning to implementation (Ali et al., 2021). Without public support, green technology investments are often considered mere corporate image strategies and fail to gain social legitimacy (Fonseca et al., 2022). Therefore, technology integration must be accompanied by a participation mechanism to ensure that the benefits are felt fairly by all relevant parties.

Local Context, CSR, and Co-Management Models

Case studies in various countries show that corporate social responsibility (CSR) practices that prioritize community involvement are more effective in improving local well-being than short-term philanthropic programs (Wilson & Kuszewski, 2020). Community representation in decision-making forums has been shown to reduce the potential for conflict and increase the legitimacy of mining policies (Arce et al., 2021). However, many CSR programs fail to have a sustainable impact because they are not integrated with corporate management strategies and public policies (Franks & Vanclay, 2022). Therefore, the co-management and benefit-sharing model is now seen as a more inclusive approach and able to ensure long-term sustainability (Haslam & Martinez, 2023).

Research Gaps and Future Directions

Previous literature has highlighted the importance of stakeholder engagement, regulation, and green technology, but few explicitly link stakeholder-based decision-making models to social, economic, and environmental sustainability indicators. This gap opens up space for research that integrates mixed methods approaches, combining qualitative analysis (interviews, FGDs) with quantitative models such as AHP and regression to test the relationship between stakeholder participation and sustainability outcomes (Mancini & Sala, 2020; Martín-de Castro, 2022). In addition, longitudinal research is needed to understand the dynamics of social legitimacy that fluctuate over time (Buxton & Parmenter, 2021). By filling this gap, research on stakeholder-based decision-making can contribute to formulating adaptive mining

governance, collaborative, and oriented towards long-term sustainability (Kapelus & Green, 2023).

METHODOLOGY

Types and Approaches to Research

This study uses a mixed methods approach with a sequential explanatory design, which combines quantitative and qualitative data sequentially to obtain a comprehensive understanding of stakeholder involvement in sustainable mining governance decision-making. This approach was chosen because mining governance issues include complex dimensions that cannot be adequately explained through numerical data or qualitative narratives alone (Creswell & Plano Clark, 2021). Quantitative data allows for a measurable analysis of relationships between variables, while qualitative data enriches interpretation through the exploration of stakeholder experiences and perspectives (Sandelowski, 2021). The selection of this design is relevant to the purpose of the research to examine the relationship between stakeholder participation levels and sustainability achievements, as well as to understand the social, political, and institutional contexts that influence the process (Fetters, 2020).

Population and Sample

The population of this study consists of the main stakeholders in mining governance in South Sulawesi, especially the Makassar area and its surroundings which are the coordination center of extractive industries in the eastern region of Indonesia. The quantitative respondents included 150 individuals who were selected through probability sampling techniques with stratified random sampling, to ensure the representation of stakeholder groups such as local governments, mining companies, local communities, and civil society organizations. Meanwhile, at the qualitative stage, 25 key informants were selected by purposive sampling based on their strategic roles and experience in the mining governance process, including government officials, company leaders, community leaders, and environmental activists. The selection of locations and participants is based on their relevance to the dynamics of conflict and collaboration in the South Sulawesi mining sector, which is often a representation of the complexity of governance at the national level (Hilson & Maconachie, 2021; Mutti & Yakovleva, 2022).

Data Collection Techniques

Data was collected through a combination of quantitative surveys and in-depth interviews and focus group discussions (FGDs). The survey instrument is a five-point Likert scale questionnaire adapted from previous research on stakeholder engagement and sustainability governance, then adjusted to the local mining context (Ghosh et al., 2020; Zhou et al., 2021). The content validity test was carried out by involving three mining governance experts and environmental academics, while the reliability of the instrument was tested using Cronbach's Alpha coefficient with a standard value of ≥ 0.70 (Hair et al., 2022). For qualitative data collection, semi-structured interviews and FGDs were used

to explore in-depth narratives about stakeholder perceptions, conflicts, and collaboration strategies. Triangulation methods are applied to increase the credibility of the data (Nowell & Albrecht, 2021**).**

Research Procedure

The implementation of the research is carried out through several systematic stages. First, the preparation stage is in the form of literature studies, instrument preparation, and research licensing to local governments and mining companies. Second, the stage of collecting quantitative data through field surveys to respondents spread across mining areas and affected areas in South Sulawesi. Third, the qualitative stage is carried out after the initial analysis of quantitative data, with in-depth interviews with key informants and FGDs to confirm and deepen the survey findings. Fourth, the data integration stage is carried out by comparing quantitative and qualitative results to build a holistic understanding. Fifth, the stage of drawing conclusions and preparing policy recommendations for sustainable mining governance (Bryman, 2021).

Data Analysis Techniques

Quantitative data were analyzed using multiple regression analysis techniques to test the influence of stakeholder participation levels on social, economic, and environmental sustainability indicators. In addition, the Analytical Hierarchy Process (AHP) method is applied to model decision priorities based on stakeholder preferences, so as to be able to integrate multidimensional considerations (Saaty & Vargas, 2021). Qualitative data are analyzed by thematic analysis through the process of coding, categorization, and interpretation of narratives to identify patterns of stakeholder engagement (Clarke & Braun, 2021). The analysis process was carried out using SPSS software for quantitative data and NVivo for qualitative data. The integration of quantitative and qualitative results is carried out by the joint display analysis approach, which allows for direct comparisons between statistical results and narrative findings (Guetterman et al., 2022). With this combination of techniques, the research is expected to provide a comprehensive picture of the relationship between stakeholder participation and the sustainability of mining governance.

RESERACH RESULT

Stakeholder Participation Rate

The results of this study show that the level of stakeholder participation in mining governance in South Sulawesi is in the category of quite high with an average score of 3.84 on the Likert scale of 1–5. This data indicates that the majority of stakeholders have relatively active involvement in various stages of decision-making, either through consultation forums, public discussions, and monitoring and evaluation activities. This involvement is a reflection that mining governance in the region is no longer completely top-down, but has begun to accommodate the principles of inclusivity and participation.

When reviewed based on stakeholder categories, local communities occupy the highest participation position with a score of 3.95. This can be interpreted that communities directly affected by mining activities show great

interest in being involved, both in providing input and in supervising the implementation of policies. This community involvement is generally manifested in village deliberation forums, conveying aspirations to local governments, and supervising the implementation of corporate social responsibility programs.

Civil society organizations ranked second with a score of 3.88, which shows the consistency of their role as a liaison for public aspirations as well as an independent watchdog of mining company practices. The mining company obtained a participation score of 3.81. Although this figure is still quite high, company participation is more realized through formal mechanisms such as the submission of periodic reports, technical consultations, and the fulfillment of legal obligations. Meanwhile, local governments recorded a participation score of 3.72, which is relatively lower than other groups, although its role as regulators and facilitators remains considered significant.

Table 1. Stakeholder Participation Score per Group

Stakeholder	**Average Participation Score (1–5)**
Local government	3.72
Mining companies	3.81
Local communities	3.95
Civil society organizations	3.88

The regression analysis conducted reinforced these findings, where the participation rate variable was shown to have a significant effect on the quality of mining governance ($\beta = 0.472$; $p < 0.01$). These results confirm that the higher the stakeholder involvement, the more positive the perception of policy legitimacy, transparency, and effectiveness. In other words, participation is not only seen as a formal obligation, but actually a determining factor in creating sustainable mining governance.

Furthermore, the results of the study also revealed that there are variations in the form of participation carried out by each stakeholder group. Local communities tend to be more active in the form of direct participation such as attending meetings, filing complaints, or proposing compensation programs. Civil society organizations are heavily involved through the preparation of alternative reports, policy advocacy, and monitoring of environmental impacts. Meanwhile, mining companies are more dominant in technocratic aspects, such as consulting with the government or preparing environmental impact analysis reports. Local governments, although they play an important role as policy makers, are still often considered formal and have not been able to accommodate all public aspirations equally.

Overall, these findings show a positive trend that decision-making in the mining sector is starting to move towards a more inclusive and collaborative pattern. The high participation of local communities and civil society

organizations is an important indicator that stakeholder-based governance has a great opportunity to increase social legitimacy and long-term sustainability. However, disparity in participation between stakeholders is also a challenge in itself, especially related to the capacity of local governments in carrying out coordination and supervision functions.

The Relationship of Participation with Sustainability

The multiple regression analysis conducted in this study shows a positive and significant relationship between the level of stakeholder participation and the sustainability dimension, both social, economic, and environmental. The results of the statistical test showed that stakeholder participation made a significant contribution to social sustainability ($\beta = 0.438$; $p < 0.01$), economic sustainability ($\beta = 0.412$; $p < 0.01$), and environmental sustainability ($\beta = 0.459$; $p < 0.01$). These figures confirm that the higher the level of stakeholder engagement, the greater the chance of achieving sustainable mining governance in various aspects.

In the social dimension, stakeholder participation has been proven to increase public trust in the decision-making process. Local communities who are actively involved feel that they have space to voice their aspirations and interests, so that the social legitimacy of companies and local governments becomes stronger. This engagement also lowers the potential for horizontal conflicts between companies and communities, as the dialogue and consultation process provides room for compromise and peaceful resolution. Thus, social sustainability is not only interpreted as social harmony, but also includes aspects of participatory justice in natural resource management.

In the economic dimension, stakeholder participation has an effect on optimizing the benefits of mining for the community. The survey results show that stakeholder involvement encourages the creation of local economic empowerment programs that are more in line with the needs of the community. This is shown by the average score of economic sustainability perception of 3.81, which indicates that the public considers the presence of mines to be starting to contribute to increased employment, alternative income, and new business opportunities. The involvement of stakeholders, especially local communities and civil society organizations, also serves as a control mechanism for companies to consistently implement social responsibility and economic empowerment programs.

Meanwhile, in the environmental dimension, stakeholder participation plays an important role in ensuring continuous supervision of environmental management practices by mining companies. The results of the analysis showed that participation had the greatest influence on environmental sustainability compared to the other two dimensions, with a coefficient of $\beta = 0.459$. This reflects that the involvement of the community and civil organizations in the process of monitoring reclamation, pollution control, and environmental conservation provides positive pressure for companies to be more compliant with environmental standards. Although the average score of environmental

sustainability perception is still relatively moderate (3.69), this trend indicates a sustained improvement thanks to active stakeholder engagement.

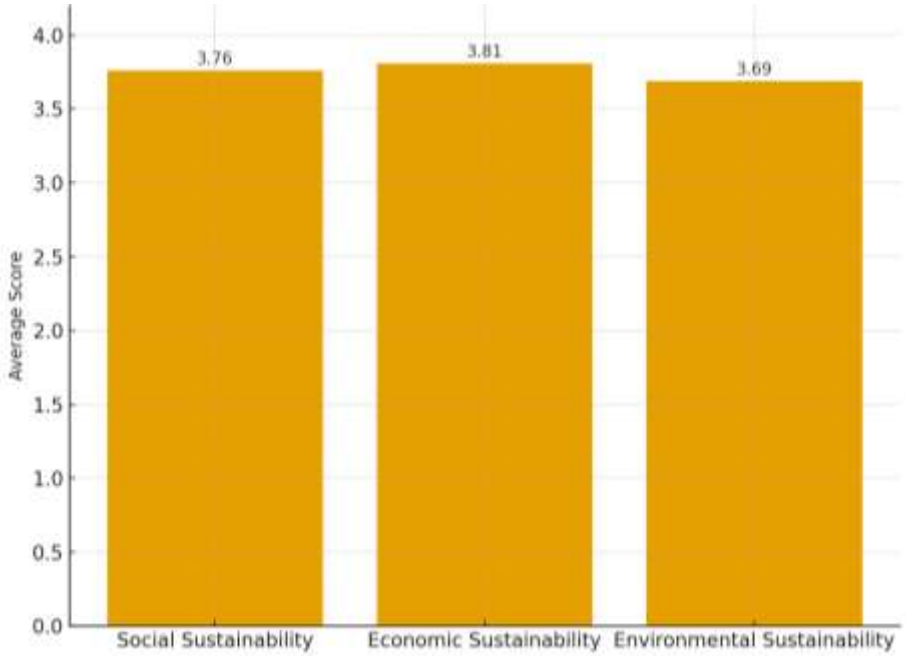

Figure 1. The Influence of Stakeholder Participation on Sustainability Dimensions

The diagram shows that the three dimensions of sustainability have increased significantly along with stakeholder participation. These findings reinforce the understanding that participatory-based mining governance not only increases policy legitimacy, but also produces a tangible impact on achieving multidimensional sustainability. Social, economic, and environmental sustainability achieved through active stakeholder engagement shows that an inclusive decision-making process is able to bridge various interests and promote a balance between economic goals, social needs, and environmental protection. Thus, stakeholder participation can be considered as a strategic factor in building sustainable mining governance in the long term.

Decision Making Priorities (AHP)

The results of the analysis using the Analytical Hierarchy Process (AHP) method involving 25 key informants show a shift in orientation in mining governance. The informants were asked to assess the priority weight of the three dimensions of sustainability, namely environmental, social, and economic. The analysis shows that the environmental dimension occupies the highest priority with a weight of 0.38, followed by the social dimension with a weight of 0.34, and the economic dimension in third place with a weight of 0.28.

Table 2. The Weight of AHP's Priorities in Mining Governance

Sustainability Dimension	Priority Weight (AHP)	Ranking
Milieu	0.38	1
Social	0.34	2
Economics	0.28	3

These findings illustrate that stakeholders in the research area are increasingly aware of the importance of preserving the environment as the main foundation of long-term sustainability. Although the economic aspect remains seen as relevant, the lower position in priorities indicates a paradigm shift from simply pursuing profits to protecting natural resources. Informants from local communities and civil society organizations, for example, emphasized that a healthy environment is a key requirement for the economic and social benefits of mining to take place in a sustainable manner. Thus, this AHP-based decision model shows that there is a consensus that environmental sustainability must be a foothold in every mining governance policy.

Social Legitimacy Dynamics

The results of in-depth interviews and focus group discussions revealed that the social legitimacy of mining companies in South Sulawesi is highly dependent on the extent to which the community feels involved in the decision-making process, especially related to environmental and social impacts. Information disclosure, fair compensation mechanisms, and the provision of space for public participation are key factors in maintaining this legitimacy.

One of the informants from the local government emphasized the importance of two-way communication between companies and the community. "*The legitimacy of the company is not enough with formal documents alone, but must be built through continuous communication with citizens*" (P-03, interview June 12, 2025). This view emphasizes that formal processes such as reports or administrative consultations are not enough to maintain public trust.

The same thing was conveyed by representatives of mining companies. "*We are trying to be transparent, but there are still challenges in reaching all levels of society. Sometimes technical information is difficult for residents to understand*" (PT-07, interview June 15, 2025). These quotes show that there is a communication gap between companies and local communities, which can ultimately affect the perception of social legitimacy.

From the perspective of local communities, their experience reveals that legitimacy can only be maintained if aspirations are truly accommodated. "*We want decisions related to the village environment not to be made unilaterally. If the community is not talked to, how can we believe it?*" (ML-11, June 17, 2025 interview). This illustrates the fundamental need for a meaningful dialogue space, not just a formality.

Civil society organizations emphasize the aspect of justice in the compensation mechanism. "*Conflicts often occur because compensation is uneven and the process is not transparent. If the company wants to go public, it will be easier to maintain its legitimacy*" (OM-05, interview June 20, 2025). This perspective reinforces the finding that social legitimacy depends not only on participation, but also on a fair distribution of benefits.

In addition, another local community informant conveyed first-hand experience related to conflicts that have arisen. "*In our area, there have been cases where companies immediately closed land access without consultation. From there came protests, because the big decision did not involve us*" (ML-14, interview June 22, 2025). This testimony shows that the absence of meaningful consultation is often a major trigger for the loss of social legitimacy.

Overall, this dynamic of social legitimacy shows that the process of building trust between companies, governments, and society is very fragile if not supported by transparent participatory mechanisms. Legitimacy cannot be maintained only through ceremonial regulations or CSR programs, but must be through continuous dialogue, information disclosure, and fairness in the sharing of benefits. These findings further strengthen the argument that sustainable mining governance can only be achieved if stakeholders are genuinely involved in every decision-making process that concerns their future.

Technology Integration and Sustainability

The findings of this study indicate that the application of green technology is beginning to be introduced in mining governance in South Sulawesi, especially in large-scale companies that have higher investment capacity. The technology in question includes the use of renewable energy such as solar panels, sensor-based digital monitoring systems to measure emissions, and the application of environmentally friendly equipment in the production process. However, the results of the interviews show that this initiative has not been fully able to build public trust. The main obstacles identified are the lack of socialization, limited technology literacy at the community level, and lack of community involvement in program planning and evaluation.

An informant from the local government emphasized the importance of the state's role in bridging technological innovation with the needs of the community. "*The application of green technology must be accompanied by public education, so that residents understand the benefits and do not feel alienated*" (P-04, interview June 10, 2025). This statement shows that the success of technology adoption depends not only on the sophistication of the system, but also on an effective public communication strategy.

From the corporate side, their focus is more directed towards operational efficiency and compliance with environmental regulations. One of the mining company informants stated, "*We have started using digital sensors to monitor air quality, but not everyone knows the results. In fact, data transparency can be the key to building trust*" (PT-08, interview June 14, 2025). This quote shows that there is a gap between the technical innovations carried out by the company and the access to information received by the surrounding community.

Local communities, as the directly affected parties, have different perceptions. For them, new technologies are considered authentic only when they provide real benefits in their daily lives. An informant said, "*We have not felt the impact directly. If pollution is reduced or access to electricity is better, then we can trust that technology really helps*" (ML-09, June 18, 2025 interview). This view confirms that the success indicators of green technology are not only measured technically, but also through the social experience of the community.

The same thing was affirmed by representatives of civil society organizations who saw the need for accountability in the implementation of technology. "*Green technology should not only be a symbol of company modernization. There must be an independent evaluation, so that the public is convinced that the benefits are really real*" (OM-06, interview June 21, 2025). This perspective shows the need for the role of non-governmental institutions in supervising so that the implementation of technology is not only a tool for corporate legitimacy.

In addition, some people also said that limited access to information is the main cause of the lack of revenue. "*We often hear that companies use new technology, but there has never been a detailed explanation in the village. Finally, the public is confused, whether there is really a change or just a claim*" (ML-15, interview June 24, 2025). This quote emphasizes the importance of data transparency, as well as the need for communication mechanisms that can reach communities at the grassroots level.

Overall, the integration of technology and sustainability in the context of mining in South Sulawesi has not been fully optimal. The successful adoption of green technologies depends on the integration between technical and social aspects, where transparency, community involvement, and independent evaluation mechanisms are key factors. Thus, while green technologies have great potential in supporting sustainability, without local community acceptance and public accountability, their implementation risks becoming merely symbolic with no real impact.

DISCUSSION

The results of this study show that the level of stakeholder participation in mining governance in South Sulawesi has a significant influence on the quality of governance and social legitimacy. The high involvement of local communities and civil society organizations suggests that mining governance can no longer rely on a top-down approach that emphasizes corporate and government dominance. These findings are in line with the view that stakeholder participation is key in building collaborative governance, where policy success is highly dependent on the active involvement of all stakeholders (Stronge, 2024). Thus, the legitimacy gained does not solely come from legal compliance, but also from public trust built through meaningful participation.

Regression analysis showing the positive relationship between participation and social, economic, and environmental sustainability confirms that stakeholder involvement is not only a procedural aspect, but also a substantive instrument in promoting multidimensional sustainability. The consistent level of significance in all three dimensions shows that participation forums, consultations, and joint monitoring mechanisms have a real effect on

improving sustainability outcomes. This is in line with participatory governance theory which states that stakeholder involvement strengthens accountability and creates feedback mechanisms that influence the behavior of companies and governments (Minadakis & Vega-Araújo, 2024). The practical consequence of these findings is the need to institutionalize participation in formal procedures, so that the mechanism of engagement is not temporary but sustainable.

The results of the Analytical Hierarchy Process which places the environmental dimension as the highest priority also provide important meaning in the context of mining. The shift in stakeholder orientation towards environmental priorities shows a collective awareness that economic and social sustainability can only be achieved if the environment is maintained in a sustainable manner. This view reinforces the basic concept that ecosystems are the foundation for long-term sustainability (Parween, 2024). In practice, this priority can be realized through stricter reclamation policies, the use of environmentally friendly technologies, and the distribution of economic benefits related to the protection of natural resources. This orientation is also in line with the global trend towards green mining practices that emphasize energy efficiency and decarbonization of operations (Onifade, 2024).

Further qualitative analysis shows that social legitimacy is dynamic and vulnerable to erosion if companies fail to maintain information disclosure and fairness in compensation. Interviews with local communities show that legitimacy cannot be maintained through formal procedures alone, but requires constant dialogue. This perspective supports the concept of social license to operate which states that legitimacy can only be maintained through the reciprocal relationship between the company and the community (Stronge, 2024). As such, companies need to avoid a symbolic consulting approach and prioritize community involvement in decision-making forums that have a direct impact on their lives.

The adoption of green technology by several mining companies in South Sulawesi also adds an important layer to this discussion. Although the use of renewable energy and digital monitoring systems have been introduced, public acceptance is still low due to a lack of socialization and data transparency. This shows that technological innovation will not generate social legitimacy without community acceptance (Li, 2024). For the community, new technologies are only considered legitimate if they provide real benefits such as reduced pollution or increased access to energy. Therefore, the success of green technology integration is highly dependent on effective communication strategies, community involvement in evaluations, and the existence of independent accountability mechanisms (Onifade, 2024).

Although this research makes a significant contribution to the development of mining governance literature, there are some limitations that need to be noted. The number of respondents as many as 150 and key informants as many as 25 provides an in-depth picture, but the limited geographical coverage of South Sulawesi makes generalization of research results need to be done carefully. The research design that is cross-cutting is also not able to capture the dynamics of social legitimacy over time. Follow-up research with a

longitudinal approach and the application of participatory action research are highly recommended to test the effectiveness of the proposed participatory interventions (Minadakis & Vega-Araújo, 2024). In this way, the theoretical and practical contributions of research can be expanded, while strengthening the foundations of a more inclusive policy.

Overall, this research makes an important contribution in enriching mining governance theory by emphasizing that stakeholder-based decision-making has a real impact on multidimensional sustainability. The results of the study show that stakeholder participation, environmental priorities, social legitimacy dynamics, and the integration of green technology are interrelated elements and form a sustainable governance framework. The main contribution of this research is the affirmation that participation should be positioned as a structural factor in mining policy design, not just a complement. By integrating participation, environmental priorities, and technological innovation in the governance framework, this research provides relevant strategic recommendations for governments, companies, and civil society to realize long-term sustainability.

CONCLUSION AND RECOMMENDATION

This research confirms that stakeholder involvement is a fundamental factor in realizing sustainable mining governance. Quantitative findings show that the level of stakeholder participation has a significant influence on the social, economic, and environmental dimensions, while qualitative analysis shows that social legitimacy can only be maintained through openness, accountability, and sustainable communication. The results also show that the environmental dimension occupies a top priority in decision-making, which confirms the importance of long-term sustainability orientation rather than short-term economic interests. Thus, this study strengthens the theory of collaborative governance and emphasizes that stakeholder driven decision making is not only a normative need, but also a practical strategy in dealing with the complexity of mining governance in South Sulawesi.

In addition to making theoretical contributions, the research also offers practical implications for governments, companies, and civil society. Governments need to institutionalize participation in formal policies, companies are required to increase transparency and adoption of environmentally friendly technologies, while civil society plays an important role in independent oversight and evaluation.

FURTHER STUDY

Although this study has limitations in the geographical scope and cross-sectional design, the results provide a solid basis for further research with a longitudinal approach and participatory action. In conclusion, mining governance based on meaningful stakeholder involvement can be a strategic framework in formulating adaptive policies that ensure long-term sustainability at both the local and national levels.

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