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Stakeholder Analysis For Environmental Management: The Case Of Tin Mining in Bangka Island

Çevre Yönetimi İçin Paydaş Analizi: Bangka Adası'nda Kalay Madenciliği Örneği

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ABSRACT

This study aims to determine the stakeholders' positions, roles, interests, and influence on the management of tin mining on Bangka Island. It is expected that this study will help understand the role of stakeholders in the management of tin mining. Research data collection was conducted using the interview method involving 81 people and a group discussion involving 15 people as representatives of a community, companies, and governments. These data were then analyzed using the power–interest grid. The results of this study showed that the central and provincial governments occupied positions as primary stakeholders or players.

Keywords: Environmental management, Mining activities, Stakeholders, Tin mining

ÖZ

Bu çalışma, Bangka Adası'ndaki kalay madenciliği yönetiminde paydaşların konumlarını, rollerini, çıkarlarını ve etkilerini belirlemeyi amaçlamaktadır. Bu çalışma, kalay madenciliğinin yönetiminde paydaşların rolünü anlamaya yardımcı olması beklenmektedir. Araştırma verisi şirketlerin ve hükümetlerin temsilcisi olan toplam 81 kişi ve 15 kişilik bir topluluğun kapsayan grup tartışması içeren mülakat yöntemi kullanılarak toplanmıştır. Bu veriler daha sonra güç-ilgi matrisini kullanarak analiz edilmiştir. Bu çalışmanın sonuçları, merkezi ve yerel hükümetlerin birincil paydaşlar veya oyuncular olarak konumlandığını göstermiştir.

Anahtar kelimeler: *Çevre yönetimi, Madencilik faaliyetleri, Paydaşlar, Kalay madenciliği*

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INTRODUCTION

A regional autonomy policy since the early 2000s has led to an expansion of mining licensing escalation. Currently, the number of mining business licenses recorded and inventoried in the Ministry of Energy and Mineral Resources has exceeded 10,000 throughout Indonesia. The centralization of governance patterns changes the system of government relations, human rights, and the environment. The rules were marked by the birth of Law No. 32 of 2004 and Law No. 9 of 2015, which mentioned that an area has the authority to manage natural resources in its territory, including licensing. Power in the area that has been handed down is not immediately followed by several legislations and regulations supporting it. Many problems emerge as consequences, including the minimal regional human resource factors and institutional and inadequate regulation, among others. Conversely, a region can grant licenses to manage natural resources (Sinaga, 2010; Prasodjo, 2015; Erman, 2017).

The Bangka Belitung Islands Province is a potential area in the mining sector because there is a lot of soil containing tin ore minerals and minerals (for example quartz sand, building sand, kaolin, mountain rock, clay, and granite). The Bangka Belitung Islands Province is also widely known as a producer of white tin (stannum) on the international market under the brand BANGKA TIN. Tin mining is mostly carried out by large companies, namely PT. Tin Mine, Tbk. The legality of unsustainable land use and excessive exploitation of natural resources without paying attention to the balance of the ecosystem is one of the triggers for environmental damage in Bangka Belitung. This situation is the impact of a prolonged economic crisis which has resulted in a social crisis. In addition, the implementation of regional autonomy that is less prepared results in unsustainable resource exploitation. In the end, this activity, which cannot be separated from natural ecosystem matters, has an impact in the form of environmental damage to the ecosystem structure of Bangka Island. Forest destruction due to mining causes many areas to experience severe drought during the dry season. When seen from the air before landing at Depati Amir Airport, the face of the Bangka Belitung land is covered in craters and gaping holes. These holes are filled with rainwater and become fertile places for the development of Anopheles mosquitoes. As a result, malaria transmission on Bangka Island is quite high.

The problem related primarily to tin mining management is the division of roles and responsibilities that still need to be clarified to local governments, mining companies, people miners, and smelters. The monopoly of tin mining areas occurs among influential stakeholders. Conflicts arise between the central and regional governments, between provincial and district governments, as well as between the government and private mining companies to monopolize mining, including small-scale mining (Erman, 2008; Irawan et al., 2014).

Previous research on stakeholders in natural resource management and mining includes research from Paletto et al. (2005), Erman (2008), Irawan et al. (2014), Lintangah (2014), Hvenegaard et al. (2015), Vogler et al. (2017) and Ahmadi et al. (2019) have been carried out and used as a reference in analyzing stakeholders in the management of tin mining on Bangka Island. These studies found that the influence and interests of stakeholders vary, with the local government having the most dominant influence and interest by Minerba Law No. 4 of 2009. However, in the context of this study, there has been a policy change, namely, Minerba Law No. 3 of 2020; thus, the influence and interests of stakeholders have also changed. This Law regulates improvements to Law Number 4 of 2009 concerning Mineral and Coal Mining, namely adding new material in the form of (1) regulations related to the concept of Mining Legal Areas; (2) authority to manage Minerals and Coal; (3) Mineral and Coal management plan; (4) assignment to state research institutions, state-owned enterprise/Badan Usaha Milik Negara (BUMN), regional-owned enterprise/Badan Usaha Milik Daerah (BUMD), or Business Entities to carry out investigations and research in the context of preparing Mining Business License Area/ Wilayah Izin Usaha Pertambangan (WIUP); (5) strengthening the role of BUMN; (6) re-arrangement of permits in Mineral and Coal business, including new licensing concepts related to rock business for certain types or certain purposes, as well as permits for community mining; and (7) strengthening policies related to environmental management in mining business activities, including the implementation of reclamation and post-mining. In this Law, regulations are also made regarding policies to increase the added value of Minerals and Coal, share divestment, guidance and supervision, land use, data and information, Community Empowerment, and continued operations for holders of Work Contracts or Coal Mining Work Agreements.

SA may help to comprehend complicated environmental systems by describing the system's properties, identifying who has a stake in those aspects, and determining stakeholders' objectives for engaging in decision-making (Mushove and Vogel, 2005). By involving stakeholders in the assessment process, SA can also promote transparency and collaboration, leading to more inclusive and effective solutions for managing environmental challenges. Ultimately, SA can contribute to sustainable resource management and the protection of ecosystems for future generations. While stakeholder engagement is important for understanding various perspectives, it can also lead to delays and conflicts in decision-making processes as different stakeholders may have conflicting interests. Additionally, relying solely on stakeholder input may overlook expert opinions and scientific evidence necessary for effective environmental management.

The current study aims to analyze stakeholders' positions, roles, interests, and influence in the management of tin mining on Bangka Island. This study was conducted in Jebus Regency, West Bangka Regency, Bangka Belitung Islands Province. The importance of understanding the management of tin mining on Bangka Island is an effort to see that there are unique conditions related to the management of tin mining with other forms of mining management of other mineral types where stakeholders at the local level have absolutely no authority while they are the parties most affected by tin mining activities.

LITERATURE REVIEW

A program's success undoubtedly necessitates the assistance and support of several parties that have an impact on it both directly and indirectly. These parties are referred to as stakeholders, or simply stakeholders. A stakeholder is a person or group of persons who have a vested interest in an organization's success in attaining its objectives (Center for Public Mental Health, Universitas Gadjah Mada, 2017). Employees, customers, suppliers, investors, and even members of the organization's community are all potential stakeholders. The success of a program is crucially influenced by the resources, expertise, feedback, and support that each stakeholder provides. Through effective engagement and communication with stakeholders, organizations can establish robust relationships and guarantee that their objectives are consistent with the interests of those who are invested in their success. Additionally, it contributes to the development of trust and credibility within the community. Organizations that actively engage stakeholders in decision-making processes are more likely to receive valuable input and buy-in from those who are impacted by their actions. This has the potential to result in more socially responsible and sustainable business practices. In the end, the organization may experience enhanced transparency, accountability, and overall success as a result of prioritizing stakeholder engagement. Companies can establish a more inclusive and ethical work environment that is beneficial to all parties by encouraging open communication and collaboration.

A stakeholder is often described as a person or entity with a stake in the corporation. Additionally, the World Business Council for Sustainable Development defines stakeholders as people or organizations that may have an impact on or influence business operations (World Business Council for Sustainable Development, 2002). Of course, parties with the power to affect and influence business operations may come from both inside and outside the organization. Internal stakeholders typically include employees, managers, and shareholders, while external stakeholders may consist of customers, suppliers, government agencies, and the local community. The relationships between stakeholders and the corporation are crucial for maintaining a positive reputation and fostering long-term success. By engaging with stakeholders and considering their interests, businesses can build trust, enhance communication, and ultimately create value for all parties involved. Successful businesses understand the importance of balancing the needs and expectations of both internal and external stakeholders. By actively involving stakeholders in decision-making processes and seeking their input, companies can ensure that their actions align with the interests of all parties involved. Ultimately, this collaborative approach can lead to increased loyalty, improved relationships, and sustainable growth for the business. It is essential for businesses to regularly communicate with stakeholders, address their concerns, and demonstrate transparency to build trust and maintain positive relationships over time.

Academics and practitioners alike employ the concept of stakeholder analysis to elucidate the primary beneficiaries of corporate social responsibility (CSR) programs. The stakeholder approach aids management in the definition of the term "social" in CSR (Maignan and Ferrell, 2004). Even though businesses are generally accountable to society as a whole, they can only be held accountable to specific stakeholders or agents. Employees, customers, suppliers, shareholders, the local community, and the environment are all potential stakeholders. Businesses can more effectively tailor their CSR efforts by identifying and prioritizing these stakeholders, which enables them to gain a better understanding of their requirements and expectations. Ultimately, this results in more significant and impactful social responsibility initiatives that benefit not only the company but also its stakeholders and the broader society. Furthermore, businesses can establish more robust relationships and trust within their communities by actively pursuing input from stakeholders and engaging with them. This can result in a positive reputation that can attract top talent and investors, as well as improved employee morale and increased consumer loyalty. In conclusion, organizations that prioritize corporate social responsibility (CSR) and stakeholder engagement are more likely to achieve financial success and have a beneficial influence on their surroundings.

According to Boesso and Kumar (2009), stakeholder theory places a premium on interactions with agents that have an impact on or influence the company. Stakeholders are actors who engage in two-way exchanges, resulting in socially created relationships. The theory goes on to outline the "identification," "treatment," and "impact assessment" components that make up a stakeholder management strategy that Freeman (Freeman, 2010) advocates. By focusing on identifying key stakeholders, determining the appropriate way to engage with them, and assessing the effects of these interactions, companies can better understand and address the needs and concerns of those who have a stake in their success. This strategic approach can help organizations build trust, foster collaboration, and ultimately enhance their overall performance and reputation in the eyes of their stakeholders. Ultimately, stakeholder theory emphasizes the importance of establishing and maintaining mutually beneficial relationships with all those who have a vested interest in the company's activities. By prioritizing stakeholder engagement and making it an integral part of their business strategy, companies can create a more sustainable and responsible business model. This not only leads to improved decision-making processes but also helps in identifying potential risks and opportunities that may impact the organization in the long run. By actively involving stakeholders in the decision-making process, companies can ensure that their actions align with the values and expectations of those who are invested in their success. Ultimately, adopting a stakeholder-centric approach can lead to improved relationships, increased transparency, and a stronger sense of accountability within the organization.

Stakeholder identification establishes which stakeholders are most significant from the company's standpoint. Power, legitimacy, and urgency are some of the criteria typically employed to define stakeholders (Mitchell et al., 1997; Reed et al., 2009). Furthermore, Freeman et al. (2010) proposed two types of stakeholders based on their level of influence: primary stakeholders (those involved in economic transactions with the business, such as shareholders, customers, and employees); and secondary stakeholders (those who are not directly involved with business operations but are affected by or can influence its actions). In comparison to numerous stakeholder qualities presented in the literature, this study employs Mitchell et al. (1997) power, legitimacy, and urgency to determine stakeholder salience in research. Power refers to the stakeholder's ability to influence the organization, legitimacy refers to the stakeholder's relationship with the organization, and urgency refers to the stakeholder's timeline for action. By utilizing these dimensions, researchers can identify which stakeholders are most critical to the success of the business and prioritize their needs accordingly. This approach allows for a more focused and effective stakeholder management strategy, ultimately leading to better decision-making and improved organizational outcomes. In addition, understanding stakeholder significance can also help organizations anticipate potential conflicts and proactively address them before they escalate. By considering the power, legitimacy, and urgency of each stakeholder, companies can tailor their communication and engagement strategies to build stronger relationships and foster mutual trust. Ultimately, by prioritizing the needs of key stakeholders, businesses can enhance their reputation, increase stakeholder satisfaction, and achieve long-term success in a competitive market.

Identifying stakeholders is the first phase in Stakeholder Analysis (SA), and it involves investigating persons, groups, and organizations that have a stake in certain social, ecological, or environmental elements of a natural resource governance problem. After identifying the stakeholders, it is necessary to categorize them according to their characteristics to distinguish between them. The categorization findings highlight the significance of stakeholders. Finally, the formal ties among stakeholders are investigated. Stakeholder analysis gathers and analyses qualitative information systematically, such as semi-structured interviews and interest-influence matrices, to determine who is interests are relevant to the process of implementing a program or policy (Schmeer et al., 1999; Reed et al., 2009). The growing adoption of SA in natural resource management indicates a growing understanding of the need for stakeholder engagement in environmental decision-making processes (Burroughs, 1999; Brugha and Varvasovszky, 2000; Selin et al., 2000). Stakeholder analysis not only helps identify relevant interests but also assesses the power and influence each stakeholder holds about the program or policy being implemented. This information is crucial for developing effective strategies for engaging stakeholders and ensuring their interests are taken into account. By incorporating stakeholder analysis into decision-making processes, organizations can enhance the legitimacy and effectiveness of their programs and policies, ultimately leading to more sustainable and successful outcomes. Additionally, stakeholder analysis allows organizations to anticipate potential conflicts or challenges that may arise throughout the implementation process. By proactively addressing these issues and involving key stakeholders in decision-making, organizations can mitigate risks and build stronger relationships with those affected by their actions. Ultimately, through a comprehensive understanding of stakeholders and their interests, organizations can create more inclusive and impactful initiatives that better address the needs of all parties involved.

Stakeholder analysis in the context of mining in Indonesia involves identifying and understanding all individuals, groups, and organizations that are impacted by or have an interest in mining activities. This process allows mining companies to assess the needs, expectations, and potential risks associated with each stakeholder group. By engaging in open and transparent communication, companies can build trust and partnerships with stakeholders, leading to more successful and sustainable mining operations. Furthermore, by considering the perspectives and input of all stakeholders, companies can make informed decisions that align with environmental and social responsibility standards, ultimately contributing to the long-term success of the mining industry in Indonesia. This approach can also help companies mitigate conflicts and address concerns before they escalate, fostering a positive relationship with local communities and government agencies. By prioritizing sustainability and responsible practices, mining companies can not only ensure the longevity of their operations but also contribute to the overall well-being of the environment and society in Indonesia. This collaborative and inclusive approach to stakeholder engagement is crucial for the continued growth and development of the mining industry in the region. Furthermore, by actively involving local stakeholders in decision-making processes, mining companies can gain valuable insights into the specific needs and concerns of the communities they operate in. This can lead to the development of more tailored and effective sustainability initiatives that address the unique challenges faced by each community. Ultimately, by working together with stakeholders to find mutually beneficial solutions, mining companies can create a more sustainable and socially responsible industry that benefits both the environment and society in Indonesia.

By conducting a thorough stakeholder analysis, mining companies can effectively engage with stakeholders, address their concerns, and work towards mutually beneficial solutions that promote sustainable development and responsible mining practices in Indonesia (Rendtorff, 2020). This collaborative approach not only builds trust and goodwill within the community but also helps companies mitigate potential risks and conflicts that may arise during the mining process. By actively involving all stakeholders in the decision-making process, companies can foster a culture of transparency and accountability, leading to greater overall success and sustainability in the industry. In the end, prioritizing stakeholder engagement is crucial for creating a positive impact on the environment, society, and economy of Indonesia. By listening to and considering the perspectives of all parties involved, companies can address concerns and find mutually beneficial solutions that uphold environmental and social responsibility. This approach not only benefits the local communities and ecosystems affected by mining activities but also enhances the reputation and long-term viability of the company. Ultimately, prioritizing stakeholder engagement is essential for ensuring that mining operations in Indonesia are conducted responsibly and sustainably for the benefit of all involved. Engaging with stakeholders also helps companies build trust and credibility within the community, fostering positive relationships that can withstand challenges and conflicts. By actively involving local communities, government bodies, and environmental organizations in decision-making processes, companies can demonstrate their commitment to transparency and accountability. This collaborative approach not only minimizes potential risks and conflicts but also fosters a more inclusive and sustainable mining industry in Indonesia. In conclusion, prioritizing stakeholder engagement is crucial for creating a responsible and mutually beneficial mining sector that prioritizes the well-being of all stakeholders involved.

MATERIAL AND METHODS

This study was conducted in Jebus Regency, West Bangka Regency, Bangka Belitung Islands Province. This location has been chosen because it is one of the areas with the most significant production on Bangka Island. There are implications for environmental, economic, social, and mining-related issues that have yet to be explored especially the involvement of stakeholders from the central to the regional level. Furthermore, balancing the input of stakeholders with expert opinions and scientific evidence is crucial to ensuring that decisions are based on a comprehensive understanding of the situation.

This approach can help mitigate conflicts and delays while also ensuring that environmental management practices are effective and sustainable in the long term. Ultimately, involving stakeholders at all levels of decision-making processes can lead to more holistic and well-rounded solutions that address the complex challenges of environmental, economic, social, and mining-related issues.

The methods used in this research were focus group discussions and interviews. The focus group discussions were used to obtain input on the role of the parties in tin mining environmental management. Meanwhile, interviews were used to deepen the information obtained from the discussion. Diverse stakeholders were able to voice their opinions and experiences on environmental management in tin mining through the focus group talks. However, the interviews gave each participant the chance to expand on their answers and offer more in-depth observations. All things considered, employing both approaches guaranteed a thorough comprehension of the subject and enhanced the study results.

There were 81 participants in the focus group discussions, comprising 22 provincial, district, and sub-district government representatives, as well as 11 village government representatives, 22 community members, 22 community leaders, and 4 commercial company representatives. Based on their knowledge, background, and engagement in community development initiatives, the participants were chosen. The village government members were chosen for their awareness of community needs, while the province, district, and sub-district government officials were picked for their familiarity with local laws and ordinances. Commercial company executives were asked to give their thoughts on public-private partnerships for development efforts, while community leaders and members were involved to offer ideas from the ground up (Table 1).

The informants were selected using a purposive sampling technique, where informants were selected with the following criteria: 1) local government elements involved as tin mining stakeholders; 2) people involved as tin miners; 3) community leaders who have knowledge and information related to tin mining activities

Table 1: The Participants of the Focus Group Discussion

Tablo 1: *Odak Grup Tartışmasının Katılımcıları*

No	Total	The Participants of the Focus Group Discussion
1.	22	The provincial, regency, and district governments
2.	11	Villages
3.	22	Community members
4.	22	Community leaders
5.	4	Representatives of commercial companies

The interviews involved 15 people consisting of 5 community representatives; 2 community leaders; 1 district government representative, 1 sub-district government representative, and 6 village government representatives (Table 2).

Table 2: The Informants Involved in the Interview

Tablo 2: *Görüşmeye Dahil Olan Muhabirler*

No	Total	The Informants Involved in the Interview
1.	5	Community representatives
2.	2	Community leaders
3.	1	The regency governments
4.	1	The district governments
5.	6	The governments

RESULTS AND DISCUSSION

Stakeholder Position and Role in Tin Mining Management

Stakeholders are individuals, communities, social groups, or organizations with a direct or indirect interest in planning and decision-making (Friedman and Miles, 2006). Regarding he management of natural resources (Grimble and Chan, 2006), stakeholders are groups of people who are organized or not and have an economic interest in the natural resource management system. Based on the findings of this study, the following stakeholders have political and economic interests in the management of tin mining:

1. The central government,

2. Local governments,

3. Companies or entrepreneurs, and

4. The community.

According to Prukkanone and Wang (2016), each of these stakeholders has an economic interest in benefiting from and power over existing resources.

This finding is in line with that of Erman (2017) regarding actors involved in tin mining, namely, governments (from the central, provincial, and regency levels to the district level), companies (PT Timah Tbk, Koba Tin, and unconventional miners), and the community. Irawan et al. (2014) analyzed tin mining stakeholders consisting of the central and local governments, entrepreneurs, investors, entrepreneurs, unconventional miners, suppliers, law enforcement, and the community. Elgifienda (2018) also found that tin mining stakeholders in Bangka Island consist of governments, authorities, miners, and the community. Tin mining management stakeholders are shown in Figure 1. Stakeholders involved in the management of tin mining are identified by their position and role. Based on its connection to a decision or activity, the part of the stakeholder is distinguished into primary stakeholder and secondary stakeholder (Friedman and Miles, 2006).

Primary stakeholders

Primary stakeholders are parties directly interested in a resource, either as a livelihood or directly involved in exploiting the natural resource. According to Famiyeh (2017), these stakeholders are also called critical stakeholders, i.e., individuals or groups that can result in a decision or activity (MacArthur, 2011). Building good relationships with key stakeholders is fundamental in mining management because mining permits are granted by the government (Wakka, 2017).

Based on the research results, the primary stakeholders in the management of tin mining are the governments at the central and provincial levels, along with the relevant agencies, namely, the Ministry of Energy and Natural Resources and the Provincial Energy and Natural Resources Office. Governments at the central and local levels have influence and interest in formulating and applying policies, namely, laws and regulations related to the primary duties in their authority; therefore, this group becomes a key stakeholder in the management of tin mining. Que et al. (2018) said that the most vocal or influential stakeholders in mining are governments at the central and local levels despite the group's diverse influence and interests. Irawan et al. (2014) also stated that the central and local governments are critical stakeholders in the management of the tin mining industry.

Figure 1. Stakeholder map of tin mining management

Şekil 1. *Kalay madenciliği yönetiminin paydaş haritası*

Additionally, governments at different levels (national, regional, and local) play a role in managing natural resources. According to Yamoah et al. (2020), collaboration between governments and organizations in the era of environmental awareness is necessary to reduce environmental degradation.

Secondary stakeholders

Secondary stakeholders are parties with an indirect interest or a party that depends on the resources or business resulting from those resources (Wakka, 2017). Secondary stakeholders in the decision-making process related to the management of natural resources are only informed about the progress of the planning process and decisions or policies taken. Secondary or non-key stakeholders related to mining management are not related or directly involved in mining operations (Famiyeh, 2017).

Based on the results of the study, parties regarded as secondary stakeholders are the district, village, company or entrepreneur, and community government. This stakeholder group has a minimal role, not even in Law No. 3 of 2020 on Mineral and Coal Mining; thus, the influence of this group is minimal.

The roles of stakeholders in the management of tin mining when referring to existing regulations, namely, the Constitution of 1945, Law No. 3 of 2020 on Mineral and Coal Mining, and Law No. 23 of 2014 on Local Government, are distinguished:

1. The central government has a role in the mastery of mining management with the primary authority.

Table 3: Recapitulation of the informant's answers related to the influence and importance of stakeholder tin mining management

Tablo 3: Paydaş kalay madenciliği yönetiminin etkisi ve önemine ilişkin bilgi veren kişinin yanıtlarının özeti

No	Stakeholders	Interest	Percentage (%)	Power	Percentage (%)
1.	Central government	45	14.7	45	24.1
2.	Provincial government	45	14.7	43	23.0
3.	Regency government	45	14.7	28	15.0
4.	District government	41	13.4	15	8.0
5.	Village government	41	13.4	18	9.6
6.	Companies/entrepreneur	45	14.7	23	12.3
7.	Community	45	14.7	15	8.0
	Total	**307**	**100**	**187**	**100**

2. The provincial government is instrumental in receiving delegated duties from the central government related to licensing mining businesses and determining mining areas, divestment schemes, and stocks in coordination with the central, regency, and city governments.

3. Regency, district, and village governments; companies or entrepreneurs; and communities play a role in local, corporate, and group interests to generate local indigenous income and drive the regional economy from the activities of tin mining businesses in Jebus district.

Stakeholder Influence and Interest in Tin Mining Management

The mapping of stakeholders in mining management is performed using interviews to identify their influence and interests. Informants are asked questions and asked their opinions regarding the level of power and interests of stakeholders on a scale of 1 (not interested or no control), 2 (interested or has power), and 3 (highly interested or a higher power) (Table 3).

The data were visualized and analyzed using the stakeholder power–interest grid (Grimble and Wellard, 1997; Ackermann and Eden, 2011) as key players, the central and provincial governments are in quadrant B, a stakeholder with the highest level of influence and importance in the management of tin mining; and as subjects, regency governments, companies or entrepreneurs, district governments, village governments, and communities are in quadrant C, with high levels of importance but have different levels of low influence significance (Figure 2).

Based on the relationship of influence and stakeholder interest in the management of tin mining, the differences concluded that each party is significant:

The environmental and social effects of mining activities directly affect local communities and environmental NGOs due to the implementation of community development

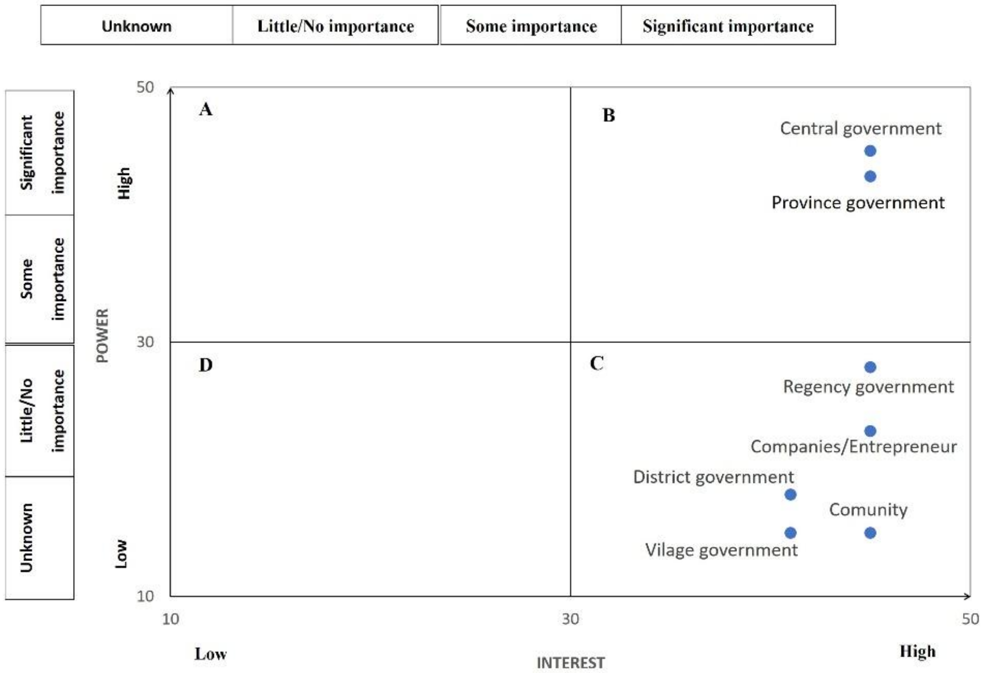

Figure 2. Stakeholder power-interest grid tin mining management

Şekil 2. *Paydaş güç-çıkar şebekesi kalay madenciliği yönetimi*

(1) The central and provincial governments as crucial stakeholders or critical players with the highest level of influence and interest in the management of tin mining due to the central authority of this institution to conduct mining management nationally at the central government level by following the Constitution 1945 article 33 and Law No. 3 of 2020 on Mineral and Coal Mining. The central and provincial governments have a high level of interest (14.7%); they still have different levels of influence, whereby the central government has a high level of power (24.1%), whereas the provincial government has a low level of power (23%).

requirements in mining laws. These laws mandate firms and/or governments to carry out socio-economic development projects in mining-affected communities, providing public goods and services like infrastructure, educational scholarships, health services, and small business assistance.

The difference in the level of influence is due to the provincial government's authority to receive delegated duties from the central government. The responsibilities of the local government are related to mining business licensing and mining area determination, determining divestment schemes, and coordinating stocks. The authority held by the government at the regional level since the change of this law has become very limited.

(2) Regency governments, companies or entrepreneurs, district governments, village governments, and communities as subjects have varying levels of high importance and low influence. Regency governments, district governments, companies or entrepreneurs, and society have the same level of interest as central and provincial governments, which is high (14.7%). Moreover, the interest level of village and district governments is lower (13.4%). The regency government has a low level of influence (15%), companies or entrepreneurs as a group have power (12.3%), the village government has a low level of control (9.6%), and companies and communities have deficient levels of influence (8%). The interests and power of this stakeholder group have a high level of economic importance to natural resources.

Central and provincial governments need to collaborate closely with district governments, companies, entrepreneurs, and society to ensure effective governance and economic development (Unger, 1996). The role of local governments in providing credit and support to enterprises, especially during times of financial restrictions, is crucial for local economic growth. Misappropriation of funds and licensing non-bank credit institutions are some ways local governments support local enterprises.

Stakeholder analysis in the context of tin mining in Bangka Island has significant implications for environmental management. By identifying and engaging with stakeholders such as local communities, government agencies, and mining companies, a more comprehensive understanding of environmental impacts and potential solutions can be achieved. This approach can help to address concerns related to deforestation, water pollution, and biodiversity loss, ultimately leading to more sustainable mining practices in the region.

The sustainable management of tin mining on Bangka Island is significantly impacted by the multifaceted implications of this research. This study enhances comprehension of the mining sector's interactions among a variety of stakeholders, including government bodies, local communities, and commercial entities, by effectively identifying and analyzing their positions, responsibilities, interests, and influences. This comprehension is essential for the creation of more effective governance frameworks and collaborative strategies that are essential for the resolution of environmental, economic, and social issues related to tin mining. The study's results can be used to enlighten policymakers and stakeholders to devise regulatory measures that are both balanced and promote sustainable development, while also reducing the negative effects of mining activities. Additionally, the knowledge acquired from stakeholder dynamics can be helpful in the development of transparent and inclusive decision-making processes, which are crucial for the resilience of local communities in the face of the ecological and socio-economic challenges posed by mining operations and the attainment of long-term sustainability objectives.

CONCLUSIONS

Stakeholders in the management of tin mining are distinguished based on the identification and mapping of positions, roles, influences, and interests of the aforementioned stakeholders. (1) Positions, the central and provincial governments are primary stakeholders or key players in the management of tin mining: the district government, village government, company or entrepreneur, and community are secondary stakeholders. (2) Roles, the central government's role is a central authority to conduct mining management nationally. The provincial government's role is to receive delegated duties from the central government. Regency, district, and village governments; companies or entrepreneurs; and communities play a role in local, corporate, and group interests to generate local indigenous income and drive the regional economy. (3) Interests, the central, provincial, regency, district, and village governments; companies or entrepreneurs; and communities have high interests. (4) Influences, the central and provincial governments have the most significant influence. Conversely, regency governments, companies or entrepreneurs, district and village governments, and communities have different levels of low influence significance.

The negative impacts of tin mining activities on environmental, economic, and social aspects can be reduced by understanding the position, role, interests, and influence of stakeholders from the results of this study. Reducing this impact is the responsibility of the government, especially the party that has dominant authority in managing tin mining, namely, the central government. The central government should see more closely that the impact of tin mining activities on Bangka Island should be addressed immediately by sharing authority with local governments at the provincial and district levels.

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