

Empowering Communities to Reduce Dependence on Unlicensed Mining and Minimize Corporate Losses: A Case Study of PTBA in December 2023



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ABSTRACT: This study aims to analyze the impact of community empowerment programs on reducing dependence on unlicensed mining and to measure the potential losses incurred by PTBA due to these activities. The time sample used in this research is December 2023. A quantitative approach is used to calculate the income earned by the community from six empowerment programs, including bamboo downstream processing, snakehead fish farming, reclamation plant cultivation, maggot farming, quail farming, and eel farming. The total income generated by these programs for 93 beneficiaries reached USD 13,238.22 per month, with an average income per program ranging from USD 153.70 to USD 244.39, which remains below the regional minimum wage (UMR) of Muara Enim Regency, set at USD 233 per month. This income is compared to assess how competitive the alternative livelihoods provided by the empowerment programs are. In addition, this study calculates PTBA's losses from unlicensed mining in the same month, based on the extraction of 0.175 million tons of coal, the market price of USD 58.28 per ton, and the lost royalties of 8%. The total financial loss reached USD 10.2 million, with USD 815,920 in lost royalties. The analysis underscores the importance of expanding and strengthening community empowerment programs to further reduce unlicensed mining activities, while also mitigating the financial and environmental impacts on the company.

KEYWORDS: Unlicensed mining, community empowering, livelihood transformation, creating shared value

I. INTRODUCTION

Coal remains a highly demanded commodity and plays a crucial role in meeting Indonesia's energy needs (Kurniawan & Managi, 2018). The country has extensive coal reserves, spanning from Kalimantan to Sumatra. Unlike other mining and mineral commodities that are often monopolized by the state, Indonesia's coal sector allows private entities to participate in exploration and mining activities (Gunawan et al., 2015). This policy fosters competition in the coal industry, where private companies, both small and large-scale, contribute to the country's revenue.

Although the private sector has room to participate, the Indonesian government still retains control over strategic coal reserves through State-Owned Enterprises (SOEs). One of the SOEs managing coal mining is PT Bukit Asam Tbk (PTBA), which holds mining licenses over a vast area with substantial production potential. PTBA's mining region encompasses a significant area and is projected to contribute greatly to both the local and national economy.

Unfortunately, the optimal utilization of PTBA's mining area has not yet been fully realized. One of the main obstacles is the rampant unlicensed mining activity occurring within PTBA's concession area (Suatmiati et al., 2022). Unlicensed mining not only reduces the potential revenue that PTBA and the state could gain, but also poses challenges to environmental sustainability and the development of surrounding areas. Moreover, the presence of unlicensed mining creates social and economic dilemmas (Sudiro et al., 2018), as local communities are often involved in these activities due to limited alternative livelihoods.

Unlicensed mining activities in PTBA's Mining Business Permit Area have spread across several villages around the mining area, including Keban Agung Village, Lingga Village, and Darmo Village in Lawang Kidul Sub-district, as well as Penyandingan Village, Tanjung Lalang Village, and Pulau Panggung Village in Tanjung Agung Sub-district. These illegal activities pose a

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significant challenge for PTBA, as the holder of the Production Operation Mining Business Permit, which strives to maintain the sustainability of its operations while protecting natural resources in the area.

As a mitigation measure, PTBA has developed a comprehensive strategy to prevent and reduce unlicensed mining activities within its concession area (Sarumaha, 2018). One approach involves conducting an inventory or mapping of locations where unlicensed mining is concentrated. PTBA has also implemented preventive measures by installing signs prohibiting mining and marking the boundaries of PTBA's WIUP area. Additionally, PTBA has blocked access roads leading to unlicensed mining sites by constructing embankments and refraining from assisting with road maintenance frequently used by unlicensed mining trucks.

PTBA has also taken repressive actions, such as conducting joint operations with law enforcement and local tripika authorities to carry out raids on unlicensed mining activities (Setiadi et al., 2023). Monitoring of the mining area using drone technology has become an essential tool for more efficient and comprehensive supervision. PTBA regularly reports these unlicensed mining activities to the authorities and all relevant stakeholders as part of its responsibility to safeguard the sustainability of its mining area.

Unfortunately, despite various efforts, unlicensed mining activities within PTBA's mining area remain widespread. This challenge illustrates that persuasive, preventive, and repressive approaches alone are not sufficient to fully stop these activities. The root cause driving local communities to engage in unlicensed mining is the lack of more sustainable and economically secure livelihood alternatives.

Previous research supports the argument that redirecting the livelihoods of those involved in unlicensed mining is one of the most effective solutions. Research by Syahnur & Diantimala (2021) shows that unlicensed mining often becomes the last resort for communities with limited access to formal employment. Corrupt relationships between regulators and the mining industry, as seen in both India and Indonesia, frequently exacerbate the prevalence of illegal mineral extraction (Ranjan, 2018). Meanwhile, Zvarivadza (2017) emphasizes the importance of community-based CSR programs that offer economic alternatives tailored to local characteristics, such as skill training and business mentoring. Successful partnerships between large-scale miners and local communities can create a positive legacy, ensuring that communities can sustain themselves after the mine is closed through investments in education, community projects, and local employment opportunities (Mulyani et al., 2023).

In response, PTBA, through its CSR program, has developed community empowerment initiatives in the affected areas. This program is designed to create new business opportunities for the community, especially for those previously involved in unlicensed mining. Skills training, access to capital, and mentoring in sectors such as agriculture, livestock, and local crafts are expected to shift the community towards more sustainable economic activities.

This research aims to analyze how community empowerment programs can reduce the community's dependence on unlicensed mining by providing sustainable alternative livelihoods, and how these initiatives can have a positive impact on both the company and the local community. This question is crucial because unlicensed mining not only harms the company by depleting resource reserves, but also increases environmental recovery costs due to non-compliant mining practices. By creating better livelihood alternatives, companies can reduce losses caused by these illegal activities while improving the welfare of the community. This study highlights the importance of synergy between companies and communities in creating sustainable shared value.

This research is significant because, based on previous studies, conflicts between local communities and mining companies are often caused by the inequitable access to natural resources that should be utilized by the surrounding community (Lung, et al., 2022). The alienation of local communities from these resources creates tension and dissatisfaction, particularly when they feel they are not benefiting directly from the exploitation carried out in their region (Shah, 2022). Therefore, this study is essential in examining how mining practices can provide a more positive and equitable impact for local communities.

The results of this research contribute to the development of fairer policies in the mining industry, where local communities can be directly involved in the value chain of the resources exploited in their area. In addition, this research can offer guidance for companies in designing more inclusive CSR programs that focus on the needs and aspirations of the local community. Ultimately, this research is expected to provide recommendations that can reduce conflicts between companies and local communities by creating mutually beneficial collaboration models, while promoting the economic and social well-being of communities affected by mining activities.

II. METHOD

This study uses a quantitative approach to analyze the impact of community empowerment programs in reducing dependence on unlicensed mining and the losses incurred by PTBA during December 2023. The data used is sourced from PTBA's

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financial reports, coal tonnage extracted through aerial image analysis, the value of lost coal, and potential lost royalties due to unlicensed mining, as well as the income of participants in community empowerment programs from various initiatives such as bamboo downstream processing, snakehead fish farming, reclamation plant cultivation, maggot farming, quail farming, and eel farming.

Data collection focuses on December 2023, which was chosen as the research time sample. To measure the benefits for the community, the monthly income data of participants in the empowerment programs will be converted from Indonesian Rupiah to U.S. dollars using the December 2023 exchange rate (USD 1 = IDR 15,511). The income from each program will be analyzed to determine how well these programs provide competitive economic alternatives, compared to the Muara Enim Regency minimum wage of USD 233 per month.

The company's loss analysis is carried out by calculating potential losses from unlicensed mining, measured by the amount of coal extracted, coal prices, and lost royalty values. The calculation is done by multiplying the extracted coal tonnage by the price per ton and the royalty the company should have received. This approach allows for an assessment of the magnitude of the company's losses and the impact of the empowerment programs in reducing unlicensed mining activities. The collected and analyzed data will provide insights into the effectiveness of the community empowerment programs and their economic impact on both the company and the local community.

III. RESULTS

A. Impact of Unlicensed Mining and Estimated Company Losses

The analysis of aerial imagery in December 2023 revealed the loss of 0.175 million tons of coal. With the coal price during that period set at USD 58.28 per ton, the total economic value of the coal extracted reached USD 10,199,000.00. Based on this value, the calculation of potential lost royalties using the 8% rate, as per Government Regulation No. 26 of 2022, resulted in royalty losses amounting to USD 815,920.00.

This financial loss, from just one month, illustrates the significant impact of unlicensed mining on the company's operations. In addition to the lost royalties and coal value, the company also bears the environmental damage caused by this activity (Buli, et al., 2018). Unlicensed mining often disregards established operational standards, leading to land degradation, deforestation, and water pollution, all of which increase the costs the company must incur for land restoration and rehabilitation (Utama, et al., 2019).

The aerial imagery revealed that unlicensed mining has caused severe environmental damage around the company's mining areas. This analysis aligns with Taher's (2023) findings, which revealed that unlicensed mining in various parts of Indonesia has led to widespread land degradation, deforestation, erosion, and water contamination due to uncontrolled mining activities. One form of damage identified is frequent land fires around unlicensed mining sites. These fires are caused by mining activities that fail to comply with safety procedures, risking the destruction of vegetation and local ecosystems while exacerbating air pollution. Fires on unlicensed mining sites are rarely addressed seriously, potentially releasing millions of tons of greenhouse gas emissions that contribute to global climate change (Fatkhullah, et al., 2023).



Figure 1. Land fire in unlicensed mining in Pulau Panggung Village

In addition, water accumulation in the voids or pits left behind by unlicensed mining activities further exacerbates environmental problems. These voids are left open after the unlicensed mining process, allowing rainwater to collect, creating

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stagnant water that can become breeding grounds for diseases and disrupt the ecosystem's balance. These voids also pose a danger to nearby communities, particularly during landslides or floods, due to the lack of adequate rehabilitation efforts.

The more severe damage occurs to water quality, where acid mine drainage resulting from unlicensed mining activities is not properly managed. This acid waste is left to contaminate the environment, particularly rivers and water sources used by local communities. This acid water can destroy aquatic habitats, disrupt plant and animal life, and pose potential health risks to communities that rely on these water sources for daily needs.



Figure 2. Waterlogging in voids from former unlicensed mining

Additionally, numerous sacks and operational waste are often left behind by unlicensed miners. This waste not only damages the aesthetic of the environment but also creates additional risks for the local ecosystem. Plastic waste and mining materials that do not decompose properly can clog water flows, worsen flooding, and pollute the soil.



Figure 3. Sacks of waste from unlicensed mining activities

These damages add to the financial burden that the company must bear, not only for rehabilitating land and restoring ecosystems, but also for implementing prevention and mitigation efforts against potential environmental disasters. As a result, the company must allocate significant budgets for recovery efforts, such as reforestation, managing acid mine drainage, and waste cleanup. These expenses increase the company's operational costs and slow down long-term sustainability efforts. Tinov et al. (2022) emphasize the need for stronger collaboration between companies, the government, and local communities to address unlicensed mining.

B. Transforming The Livelihoods of Unlicensed Miners through Community Empowerment

The community empowerment programs launched by PTBA play an important role in transforming the livelihoods of unlicensed miners by offering more sustainable economic alternatives. In addition to providing new skills, these programs also generate significant income for beneficiaries, thereby reducing their dependence on unlicensed mining activities.

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One such program, Bamboo Downstream Processing, run by Karang Taruna Kecamatan Tanjung Agung with 9 beneficiaries, provides an average monthly income of USD 153.70. This program processes bamboo into high-value products such as furniture and crafts, which not only contribute to local income but also help preserve natural resources in the area.

The Snakehead Fish Breeding and Cultivation Program, with 15 beneficiaries from the Putra Susukan Fish Cultivation Group, provides an average monthly income of USD 173.83. This activity offers a profitable alternative for the community by focusing on the cultivation of fish with high economic value, while also promoting sustainable fish farming practices.

The Reclamation Plant Cultivation Program from SIBA Pembibitan Tanjung Karang, involving 49 beneficiaries, is one of the programs with the most significant economic impact, generating an average monthly income of USD 244.39. This program focuses on the reclamation of former mining land while contributing positively to the environment by restoring damaged ecosystems.

The Maggot Farming Program, run by the Kumata Maggot Cultivation Group, involves 4 beneficiaries with an average income of USD 162.47 per month. This program teaches how to utilize maggots for managing organic waste and turning it into economically valuable animal feed.

Additionally, the Quail Farming Program, which involves 9 beneficiaries from the Bangsal Pematang Quail Farming Group, provides an average monthly income of USD 198.57. This program focuses on quail farming for producing eggs and meat, which have a stable market and high demand.

Finally, the Eel Farming Program run by the Pandawa Eel Cultivation Group in Tanjung Lalang Village, with 7 beneficiaries, generates a monthly income of USD 170.20. Eel farming has a large market potential and offers promising economic opportunities for former unlicensed miners.

Table 1. Empowerment programs, beneficiary communities, and the economic value generated

Community Empowerment	Community	Beneficiaries	Average Income/mo
Bamboo Downstream Processing	Karang Taruna of Tanjung Agung District	9	153.70
The Snakehead Fish Breeding and Cultivation Program	Putra Susukan Fish Cultivation Group	15	173.83
The Reclamation Plant Cultivation Program	SIBA Tanjung Karang Seedlings	49	244.39
The Maggot Farming Program	Kumata Maggot Cultivation Group	4	162.47
The Quail Farming Program	Pematang Bangsal Cultivation Group	9	198.57
The Eel Farming Program	Pandawa Eel Cultivation Group of Tanjung Lalang Village	7	170.20
Total		93	13,237.93

Overall, these community empowerment programs have economically benefited 93 beneficiaries, with total monthly income reaching USD 13,238.22. By providing more sustainable and legal livelihood diversification, these programs not only reduce dependence on unlicensed mining but also improve community welfare and support environmental conservation (Abeje, et al., 2019). The success of these programs highlights the importance of community-based approaches in addressing complex social and economic issues (Habib & Fatkhullah, 2023) such as dependence on unlicensed mining.

IV. DISCUSSION

Based on the research findings, the income generated from professions resulting from the transformation of unlicensed mining through community empowerment programs is still lower compared to the potential income from unlicensed mining activities. Although programs such as bamboo downstream processing, snakehead fish farming, maggot farming, and others have provided income, the average monthly earnings of program participants, as shown in the table, remain below the income obtained from unlicensed mining activities, particularly in terms of the volume and high market value of coal.

Furthermore, some of these empowerment programs still generate income below the minimum wage standard of Muara Enim Regency, which is approximately USD 233. For example, the bamboo downstream processing program only generates USD 153.70 per month, and maggot farming generates USD 162.47 per month. The reclamation plant cultivation program is one of

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the few approaching the minimum wage, with a monthly income of USD 244.39, but the majority of programs still lag behind. This poses a challenge in attracting the community to fully transition from unlicensed mining, which tends to yield higher returns in a shorter period.

Additionally, while these programs have successfully empowered several individuals, this does not necessarily ensure that those who have transitioned from unlicensed mining will be followed by the entire community. A study conducted by Mulyani, et al. (2024) highlights various challenges in transforming the livelihoods of the community. One major challenge is the possibility that the positions vacated by former miners who successfully transitioned may be filled by other workers or community members who have not yet found alternative employment. This creates a new cycle in which, despite the success of the empowerment programs, unlicensed mining activities do not entirely cease but instead experience a shift in the workforce.

Nonetheless, these programs cannot be considered failures. It is important to consider the broader context in which the growth of unlicensed mining activities far outpaces the availability of alternative employment that can be provided by the empowerment programs. From 2018 to 2023, the number of unlicensed mining sites increased dramatically, from 34 sites to 162 sites. This significant growth demonstrates a high demand for jobs, while the availability of economic alternatives provided by community empowerment programs remains limited in capacity and scale. Therefore, although the program has had a positive impact on some segments of the community, there is a crucial need to expand the scope of the programs to keep pace with population growth and job demand.

Overall, the transformation of livelihoods from unlicensed mining to more sustainable professions requires a more comprehensive and sustainable approach. This includes scaling up the empowerment programs, increasing the income offered, and closely monitoring the social dynamics within the community to ensure that the transition of professions does not result in vacancies that can be filled by new workers.

V. CONCLUSION

This study shows that community empowerment programs can provide significant benefits to the company by reducing potential losses from unlicensed mining. A concrete example is from December 2023, when PTBA lost 0.175 million tons of coal, with losses amounting to USD 10.2 million and royalties lost totaling USD 815,920.00. By expanding empowerment programs and increasing community involvement, the company can mitigate these losses while also reducing the negative environmental impact caused by unlicensed mining.

For the community, these empowerment programs have provided alternative income opportunities. However, in quantitative terms, the income generated from these programs remains below the minimum wage standard in Muara Enim Regency (USD 233). For example, the Bamboo Downstream Processing program generates an average of USD 153.70 per month, while Maggot Farming generates USD 162.47. In total, the monthly income from all community empowerment programs reaches USD 13,238.22 for 93 beneficiaries. Although these programs offer stable income, the amount still needs to be increased to truly serve as a competitive alternative to income from unlicensed mining.

While these community empowerment programs have not yet fully addressed the dependence on unlicensed mining, they have nonetheless succeeded in creating positive impacts for both the company and the community. To achieve more optimal results, the company needs to expand the scale of these programs, increase the economic value generated, and continue collaborating with relevant stakeholders to ensure the economic and social sustainability of the local community.

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