

Socio-Economic Dynamics: Traditional Mining and Community Resilience in South Kalimantan

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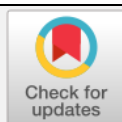
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ABSTRACT

Indonesia has abundant natural resources, including valuable diamonds, greatly impacting its mining industry, economy, and other environmental and societal sectors. This research, conducted in Sungai Tiung Village, Cempaka Sub-district, Banjarbaru City, South Kalimantan Province, Indonesia, explores how the use of natural resources, economic activities, and community resilience are interconnected by examining the enduring traditional mining practices in South Kalimantan, focusing specifically on diamond panning. Using qualitative research methods, this research collected comprehensive data through observations, interviews, and documentation involving key stakeholders such as miners, local communities, and government representatives. The analysis, which incorporates triangulation and expanded observations, reveals three key aspects of traditional mining patterns: the equipment used, the complexities of the work system, and how mining outcomes are shared. The findings highlight the resilience embedded in the traditional mining practices of diamond prospectors in South Kalimantan, showing how these practices influence work methods and reflect traditional community life, characterized by a cooperative and tolerant approach. As a result, this research deepens our understanding of diamond panning. It provides valuable insights into the relationship between traditional practices and the resilience of local communities on a broader scale.

Keywords: Community Resilience; Diamond Mining; Natural Resource Utilization; Socio-Economic Dynamics

1. Introduction

Indonesia, endowed with abundant natural resources, experiences significant impacts on its economic, environmental, and social sectors due to changes in resource utilization (Dutu, 2015; Ross & Wall, 1999; Rosser, 2007). Among these resources, diamonds play a pivotal role in the mining sector, driving the country's economy (Acharya, 2014). However, to ensure sustainability and environmental protection, the government enforces stringent policies to balance industrial growth and its ecological consequences.

South Kalimantan is a significant location for mining activities, particularly diamond mining, locally known as panning, centered in Sungai Tiung Village, Cempaka District, Banjarbaru City. This tradition has deep historical roots, dating back to the Banjar Kingdom, and it continues to be a vital source of income for the local community (Akmiyati et al., 2020). Diamond panning, a traditional livelihood of the Banjar tribe, sustains economic activities and reflects cultural heritage. The enduring practice of diamond panning is characterized by a reliance on traditional methods, showcasing the community's attention to potential environmental impacts. The mandulang mining system, passed down through generations, emphasizes a connection to nature beyond mere resource extraction.

While serving as a linchpin for local economic stability, traditional mining practices, including diamond panning, maintain a delicate balance with the environment. Often more localized and less impactful than modern mining, these practices showcase a unique relationship with nature. Spiritual beliefs and values foster a sense of responsibility toward environmental sustainability (Ali, 2021; Rajaram et al., 2005; Vlassenroot & van Bockstael, 2008).

However, despite their environmentally friendly aspects, traditional mining practices are not entirely without impacts. Physical effects on land and ecosystems and social and economic consequences necessitate careful consideration (Brain, 2017; Githiria & Onifade, 2020; Hagos et al., 2016). To address these challenges, integrating mitigation measures and enhancing sustainability is imperative. This includes adopting environmentally friendly technologies, implementing land restoration approaches, and involving the community in decision-making processes related to mining.

In the context of traditional mining, community participation and responsibility are crucial. Communities actively engage in decision-making processes, contributing local knowledge to enrich decision-making. Simultaneously, their moral and ethical obligations ensure a commitment to preserving the environment and promoting sustainable practices. This research aims to provide a comprehensive overview of traditional panning and mining practices in South Kalimantan. In contrast to previous studies focusing primarily on cultural aspects, this research uniquely concentrates on conducting socio-economic research related to the enduring traditional mining patterns practiced by diamond prospectors in the region.

2. Literature Review

2.1. Diamond Mining in South Kalimantan

Indonesia boasts abundant natural resources, and the strategic shifts in their usage have far-reaching impacts across economic, environmental, and social spheres. Among these resources, diamonds are central, driving the mining sector and propelling Indonesia's economy forward (Anggariani et al., 2021; Saroji, 2022). Mining activities, encompassing nickel, tin, and coal, significantly contribute to the nation's exports. However, pursuing industrial expansion necessitates carefully balancing growth with environmental conservation. Recognizing this necessity, the government has implemented rigorous policies to promote sustainability and protect the environment (Sari, 2019).

This narrative unfolds in South Kalimantan, specifically in the diamond mines of Sungai Tiung Village, Cempaka Sub-district, Banjarbaru City. Local diamond mining practices, commonly called “panning,” involve meticulously sifting through gold, diamonds, or ore using a pan (Barokah, 2022; Elvania, 2023). For many, being a diamond panner is not just a job but a daily lifeline. The outcomes of their endeavors are inherently uncertain, ranging from abundance to scarcity. Interestingly, beyond their material worth, diamonds are seen by the residents of Sungai Tiung Village as unexpected bearers of fortune.

2.2. Sustaining the Livelihood of the Banjar Tribe and Promoting Economic Prosperity

The Banjar tribe has a long-standing tradition of diamond panning, which has made the Banjar Regency and Banjarbaru City in South Kalimantan Province well-known areas for diamond production. Since the time of the Banjar Kingdom, Banjar traders have been involved in diamond trading activities, with excavation and panning sites scattered across the capital of the Banjar Kingdom in Martapura. Despite this rich history, the exact origins of diamond digging remain unclear, as historical records have yet to be discovered. Key mining areas are strategically located in Cempaka, Banjarbaru, Karang Intan, Simpang Empat Sub-district, Pengaron sub-district (Riam Kiwa), and Bati-bati Sub-district, Tanah Laut Regency (Adrian, 2022; Ramadhani et al., 2022).

Diamond panning, a tradition of the Banjar tribe, is a vital method of utilizing natural resources to strengthen the community's economy. Rooted in the principles of sustainable development, this practice reflects the Banjar tribe's dedication to meeting present needs while ensuring the well-being of future generations (Nikmah & Yamani, 2022). By embracing economic prosperity, social justice, and environmental protection, the pursuit of a sustainable economy aims to alleviate poverty, reduce income inequality, and tackle unemployment by creating job opportunities within the community (Naumi & Trilaksana, 2015). Engaging in diamond panning is a source of income and a pathway to fostering economic stability and environmental harmony within the Banjar community.

2.3. Preserving Tradition Amid Technological Advancement

In the era of rapid technological progress, diamond panners persist in maintaining traditional methods, viewing them as a deliberate response to potential future challenges posed by natural resource utilization and environmental impacts. Known locally as the “*mandulang*” method, this mining technique continues to be conventionally practiced and passed down through generations (Normuliati et al., 2022).

Traditional mining fosters stability and drives local economic progress, especially the age-old diamond panning tradition. Beyond its historical significance, diamond panning acts as a contemporary economic catalyst, offering a tangible source of income for those actively involved. Furthermore, its influence extends beyond direct participation, creating a ripple effect across various interconnected sectors, shaping local trade dynamics, facilitating supplementary services, and initiating a spectrum of economic activities propelled by the sustained practice of this traditional mining method.

The relationship between traditional mining practices and the surrounding environment is intricately intertwined, contributing to and reinforcing a delicate balance. Initially, traditional mining methods were characterized by their localized nature and smaller scale of exploitation than modern mining operations. This approach significantly reduces direct environmental impacts, minimizing extensive open excavation and the use of hazardous chemicals.

2.4. Living in Harmony with Nature

Practitioners of traditional mining, deeply entrenched in historical customs, view nature as a resource to utilize and a life partner. This perspective highlights a connection beyond practical purposes, emphasizing a profound duty towards environmental sustainability. Spiritual beliefs and traditional values embedded in these practices play a crucial role in shaping a collective sense of responsibility towards preserving the natural environment (Mobtaker & Osanloo, 2015; Taylor, 2013).

The economic well-being and livelihoods of local communities are intricately linked with the environmental sustainability of traditional mining practices. Communities reliant on natural resources are strongly motivated to maintain the delicate balance of their ecosystems (Amoah et al., 2020; Giurco & Cooper, 2012). This commitment stems from economic considerations and understanding the reciprocal relationship between community welfare and a flourishing natural environment.

However, it is essential to acknowledge that traditional mining practices are not entirely without impacts, despite their environmentally friendly aspects. While they may demonstrate greater sensitivity to ecological concerns in certain aspects, it is crucial to recognize and address the challenges and consequences that persist. Balancing economic activities and environmental conservation requires a nuanced understanding of potential impacts (McCarthy et al., 2023; Owen & Kemp, 2013).

In this regard, the physical effects on land and surrounding ecosystems become significant considerations. Traditional tools and techniques, integral to mining practices, can influence soil and water quality, with implications for the broader ecological landscape (Feng et al., 2019; Kuter, 2013). The sustainability of water resources and biodiversity is particularly vulnerable to these influences, necessitating a comprehensive approach to mitigate potential adverse effects.

Furthermore, traditional mining practices can trigger social and economic impacts. Community participation in these activities may lead to conflicts related to land rights, distribution of produce, or even induce social changes within the community. Since no mining practice is entirely immune to impacts, integrating mitigation measures and promoting heightened sustainability is crucial in traditional mining. This may involve introducing more environmentally friendly technologies, adopting land restoration approaches, and initiatives to enhance community involvement in decision-making processes related to mining. As a result, traditional mining practices can coexist harmoniously with ecological, social, and economic sustainability.

2.5. The Dual Role of Community Engagement in Traditional Mining Practices

Traditional mining practices shape ecological landscapes and significantly influence communities' social and economic dynamics. Local community involvement in these activities can spark a series of social and economic consequences, ranging from conflicts over land rights and resource distribution to instigating transformative social changes within the community (Bridge, 2004; Conde & Le Billon, 2017).

Acknowledging the inevitable impacts of mining practices, it becomes imperative in traditional mining to integrate mitigation measures and promote heightened sustainability. This requires a multifaceted approach, including introducing environmentally friendly technologies, adopting land restoration strategies, and enhancing community participation in decision-making processes related to mining.

The active engagement and responsibility of the community in preserving and managing natural resources underscore their pivotal role in maintaining ecological sustainability and

balance within their environment. This involvement encompasses decision-making processes concerning resource management, which involves planning, implementing, and evaluating policies or programs that affect the environment. Communities' diverse perspectives, local knowledge, and practical experience enrich decision-making.

At the same time, community responsibility entails moral and ethical obligations to care for and protect the environment and its natural resources (Jena & Behura, 2023; Ojo, 2020; Postma, 2006). This includes minimizing negative impacts, ensuring resource sustainability, and supporting practices that promote environmental well-being.

In traditional mining, community participation extends to determining mining areas, establishing rules for natural resource use, and even directly engaging in mining activities. Community responsibility is evident in their efforts to uphold ecosystem sustainability, preserve biodiversity, and implement environmentally friendly mining practices. Therefore, community participation and responsibility emerge as crucial elements in striking a harmonious balance between natural resource utilization and environmental sustainability, bolstering efforts to achieve sustainable mining practices and empower local communities.

3. Research Methodology

This study utilizes qualitative research methods to thoroughly examine the traditional mining practices carried out by diamond prospectors in South Kalimantan. The research findings are presented descriptively to gain a deep understanding of the subject.

The data for this research is gathered from a diverse group of 48 informants, including miners, purchasers of mining products, sellers of souvenirs made from mining materials, food vendors, and informal and formal community leaders. Secondary data is acquired through an extensive review of relevant literature.

A combination of interviews, observations, and documentation is employed for data collection. In-depth interviews are conducted with informants, such as panners, community members residing near mining sites, village authorities, and sub-district officials (Bungin, 2013; Creswell, 2012). Primary sources include the Central Bureau of Statistics for Banjarbaru City and Cempaka Sub-district documents.

The data analysis follows the established pattern outlined by Miles and Huberman, which includes sequential data reduction, presentation, and verification stages. Researchers meticulously select relevant data focusing on the research objectives and present it in a narrative format to derive meaningful conclusions (Miles & Huberman, 1994). Throughout the data analysis process, researchers continuously validate the data by utilizing extended observations and triangulation of sources, methods, and timeframes. This rigorous approach ensures the reliability and validity of the research findings.

4. Results and Discussion

The Cempaka Diamond panning area is 10 km from the center of Banjarbaru city and is renowned for its high-quality diamonds formed through the geological processes of the Meratus Mountains. Despite advancements, diamond panning in this area continues to rely on traditional methods. Recognized for its natural beauty, this site holds significant tourism potential that warrants further development. Additionally, it stands as a testament to the region's geological history, with alluvial deposits containing primary diamonds dating back to the formation of the Meratus Mountains (Fajariah, 2023).

The context of the Cempaka diamond panning site includes former excavation areas near the residential complex of Cempaka Banjarbaru residents. This site is one of four designated by

the government for preparation as part of the Meratus Geopark, a UNESCO-recognized initiative to preserve geological, biological, and cultural heritage and located at coordinates 3°50'75.75 "S and 114°84'12.50" E in Cempaka, Banjarbaru City, South Kalimantan.

A "panner" refers to individuals engaged in panning activities. Traditional Cempaka diamond panning, dating back to the 9th century AD, is symbolic of the rich cultural heritage of the Meratus Geopark site, blending cultural elements and local wisdom from the community. This area has been incorporated into the tourist village of Banjarbaru City, retaining its traditional character. It is inhabited by indigenous people who have practiced diamond panning for generations (Febriana et al., 2013). Notably, it remains the sole site for traditional diamond panning, preserving techniques passed down through generations. Despite the global trend towards modernization, diamond panners in South Kalimantan uphold these traditional methods, reflecting the region's cultural resilience amidst globalization's economic transformations.

In this context, the traditional diamond panning practices in South Kalimantan can be analyzed across various dimensions:

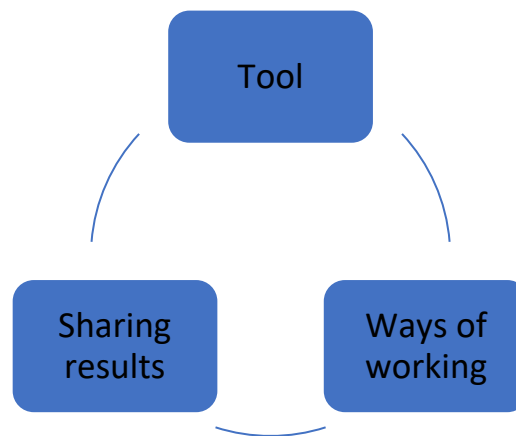


Figure 1. Diamond panning patterns in Cempaka Sub-district, Banjarbaru City

Source: Research Data (2023)

First, use of tools. Until now, South Kalimantan is famous as a diamond-producing area in Indonesia. Generally, diamonds are produced through traditional "diamond panning" and using tools such as *linggangans*. However, nowadays, machines are also used to suck up soil containing diamonds from diamond-digging holes.



Figure 2. The traditional tool for diamond panning

Source: Research Data (2023)

The panning location can reach depths of up to 15 meters. Miners often spend entire days utilizing a *linggangan* tool, a cone-shaped wooden device resembling an upside-down hat. They rely on this tool for their work. An electric water pump is also employed to collect and wash the findings. Traditional excavation methods, however, are more time-consuming. It takes about one week to reach a depth of seven meters. Miners install large wooden beams every half meter to support the earthen walls. Reeds are placed between the logs to prevent soil from collapsing, and hand-span-sized twigs are positioned crosswise between the logs and reeds. This process continues until the desired depth is reached. Diamond panning in South Kalimantan still relies on traditional equipment, embodying a method, mindset, and practice passed down through generations. Therefore, traditional technology serves as a tool for addressing challenges using traditional methods (Heldiansyah et al., 2019).

Secondly, regarding its operation, three work patterns are employed by diamond panners in South Kalimantan, each determined by the location of the diamonds being mined and the method of panning:

- a) *Pasiraman* involves repeatedly diving to extract soil containing diamonds from the riverbed. This method is typically utilized during the low river water level during the dry season.
- b) *Luang Surut* is employed when diamonds are close to the surface, eliminating the need for deep digging. Previously, water from the hole was drawn using only a dipper or bucket, but now, a water pump machine is utilized.
- c) *Luang Dalam* is used when diamonds are located deeper underground. In this method, miners dig until they reach the diamonds, gauging the depth using a ladder.



Figure 3. Diamond Panning Activities

Source: Research Data (2023)

In diamond panning in South Kalimantan, the traditional work methods also influence the system of sharing the results. The miners find results using traditional methods of ebb and flow in different ways. During low and low tides, all costs are borne by cooperation between fellow miners and shared equally. Likewise, the net proceeds obtained are divided equally between the working diamond panners. However, in the working capital aspect, all costs are provided or borne by several parties involved while working to pay for diamonds in each area under their control (Ramadhana & Juhadi, 2021). These costs include all procurement of facilities and living costs panning, which is treated while the panning is in progress. In one distribution of the results of diamond panning, many elements are considered or involved in the implementation and the distribution of the results if diamonds are found. These elements consist of:

- a) *Tutuha Luang*, who led the work and covered all financing
- b) Diamond miner
- c) *Malim* is a person who gives instructions regarding locations that contain diamonds inwardly.
- d) The sub-district head is involved in collection retribution as the local and regional head.

In the local language, the mandala method mining system is still carried out traditionally and is inherited from generation to generation. This mandala method can be differentiated from a deep hole if the layer of rocks containing diamonds is more than 3 meters below the ground surface. What is meant by the low tide (shallow hole) is when the rock layer is located less than 3 meters below the ground surface (Fadilah, 2021; Intan, 2023). There are differences in the mining methods and forms of cooperation between the two systems. Even though there are differences in work systems, both men and women can work in both systems. Male workers dig the earth and install wood to support the earth walls to prevent landslides. Female workers are above the pit and in charge of receiving the excavated soil. Next, the soil is sifted using a sieve called a *lenggang*.

Third, sharing of results. This diamond panning business activity has been carried out for generations using various traditional equipment. The implementation of cooperation in diamond panning consists of several people working together; profits and losses are borne together. This kind of thing often happened in previous societies. However, the implementation of cooperation in diamond panning that often occurs now is the financier (owner of the machine

and land) and the panning parties, where one is the head of the panning work. There are two financiers (between the machine owner and different land owners) and several miners, one of whom is the head of the work. The division of diamond panning proceeds between investors and workers is that investors (machine owners and land owners) get 50%, and workers get 50% according to the previously agreed terms. According to the agreement, the distribution for investors (land owners) gets 20% or 15%. The financier (machine owner) gets 50%, and the workers get 50% after the distribution is deducted and handed over to the landowner. This distribution has become an agreement between the parties, although sometimes, over time, there are changes to the initial agreement, both from the financier, the head of work, and members of the workers; this occurs because of losses between the parties, so the initial agreement does not work as desired.

The implementation of cooperation in the diamond panning business for all workers is divided equally, whatever the reason; in other words, whatever results they get, the distribution remains the same. Many workers feel this is unfair because their skills are different. Then, the head of work sometimes distributes the results to worker members according to his wishes, even if it differs from the initial agreement. In this case, many workers feel aggrieved and betrayed because it does not follow what they do. However, some workers get a share according to their skills; if they are new or have no experience in planning, they will get a different share than those who are old or experienced. If damage or loss occurs during panning, it is the responsibility of the head of work to deal with the capital owner in terms of damage and so on.

If the machine is damaged, the financier will be responsible for providing capital to the head of work to repair it. Thus, the head of work sometimes gets a bonus from the capital owner if the panning results make a big profit. However, if a loss occurs, most investors destroy the initial agreement agreed upon by the parties involved in the business. The initial agreement was that capital owners would only get a share of the proceeds from panning for large diamonds, while the proceeds for small diamonds would become the workers' rights. However, to cover their losses, the capital owner asks for something that is not their right. In cases like this, workers cannot comment because they are worried that finding capital for the diamond panning business will be difficult. Then, it becomes a solution that they agree on among the workers in the group to cover whatever results they get.

Based on this description, it can be said that the traditional work patterns that are still applied by diamond panners in South Kalimantan increase cooperation and give rise to new ideas in society related to increasing the division of labor, which has implications for the type of social solidarity (Jumarianto, 2021; Ritzer, 2004). This is like in traditional society; there is a common identity among community members, and they build social cohesion based on mechanical solidarity (Erawati & Wuarlela, 2022; Rahmawati, 2016). Generally, traditional societies have a small number of members and carry out relatively the same activities and work, socialize through the same patterns, share experiences, and develop relatively the same values.

5. Conclusion

Diamond panning activities in South Kalimantan, particularly in Cempaka Sub-district, exemplify utilizing natural resources for community economic endeavors. Adopting traditional methods in these activities emphasizes the necessity of collective efforts rather than individual pursuits. However, it is essential to acknowledge the limitations of traditional practices, including potential environmental impacts and sustainability challenges. Future research could explore innovative approaches to enhance the environmental sustainability of diamond

panning and address potential socio-economic challenges. Therefore, in panning, traditional conditions with social values such as cooperation, mutual assistance, tolerance, and mutual trust shape work systems and results distribution. Consequently, it can be asserted that the social system cultivated by miners employing traditional methods possesses distinctive characteristics, functioning as a social space where diverse domains of action can evolve, driven by various social dynamics.

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7. Declaration of Conflicting Interests

The authors have declared no potential conflicts of interest concerning this article's research, authorship, and/or publication.

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