Journal of General Education and Humanities
Vol. 5, No. 4, August 2026, pp. 5903 – 5923, https://doi.org/10.58421/gehu.v5i4.1736
ISSN 2963-7147

Economic Pressure and Social Deviance in Illegal Tin Mining at *Kolong* Buntu, Sungailiat, Bangka Regency: A Qualitative Case Study Based on Merton's Anomie Theory

M. Adha Al Kodri[1], Fazril Ilham[2], Nadifa Alisya[3], Defa Gilfandes[4], Yang Muthia[5], Jakaria[6]
[1,2,3,4,5,6]Universitas Muhammadiyah Bangka Belitung, Indonesia

Article Info

Article history:

Received 2026-06-11
Revised 2026-08-10
Accepted 2026-08-31

Keywords:

Anomie Theory
Economic Pressurer
Illegal Tin Mining
Social Deviance

ABSTRACT

This study examines economic pressure and social deviance in illegal tin mining at Kolong Buntu, Sungailiat, Bangka Regency, through Robert K. Merton's Anomie Theory. This study used a qualitative case study approach. Data were collected through interviews with 16 informants, comprising five miners, four residents, two community leaders, three local government or village officials, and two law enforcement officers, supplemented by field observations and document analysis. The findings show that miners' involvement was linked to income instability, limited access to legal employment, and the need to secure immediate earnings. Illegal mining operated through an informal network involving field miners, managers or coordinators, equipment controllers, and tin buyers or collectors. Field observations identified water turbidity, mud accumulation, damage to pit margins and vegetation, and machinery noise. Enforcement measures did not fully prevent recurring activities because managerial and buyer networks, worker replacement, adaptive operating patterns, and limited surveillance continued to sustain illegal mining opportunities. From an anomie perspective, *innovation* more adequately explains economically vulnerable workers with limited access to legitimate means than controlling actors with greater resources and market access.

Corresponding Author:

Listy Lestari
English Education Study Program, Faculty of Teacher Training and Education, Tadulako University, Palu, Indonesia
Email: listylestari.id@gmail.com

1. INTRODUCTION

Illegal tin mining at Kolong Buntu, Sungailiat, Bangka Regency, represents a criminological issue at the intersection of legal violations, economic interests, social relations, and environmental degradation. The persistence of illegal mining cannot be explained solely by individual actors deliberately violating mining regulations. It must also be understood in relation to the social conditions that shape people's economic choices, particularly when the need to secure an income meets limited access to legal employment and legitimate livelihoods. This perspective matters because illegal mining may persist despite law-enforcement interventions and community awareness of the legal and ecological risks associated with these activities.

The socioeconomic context of Sungailiat and Bangka Regency further underscores the importance of examining this issue structurally. Sungailiat District's population reached 96,369 in 2024. In the same year, tin ore production recorded by PT Timah Tbk in Sungailiat District amounted to 2,481.81 tons [1]. These figures indicate that tin-based economic activities remain an integral part of the local economic structure. Data also show that the open unemployment rate in Bangka Regency declined from 4.91% in 2024 to 4.75% in 2025. However, the number of people living in poverty increased during the same period, from 14.76 thousand people, or 4.24% of the population, to 16.58 thousand people, or 4.71%. The contribution of the mining and quarrying sector to the Gross Regional Domestic Product of Bangka Regency also increased from 8.16% in 2024 to 8.63% in 2025 [2]. These conditions suggest that declining unemployment has not automatically eliminated economic vulnerability, while mining continues to occupy an important position within the regional economy.

Robert K. Merton's Anomie Theory helps explain the relationship between economic pressure and the use of illegal means. Merton's original formulation conceptualizes deviance as a consequence of the strain arising between culturally emphasized goals and the availability of legitimate institutional means to achieve them [3]. When individuals continue to be expected to attain economic success while access to legitimate means is unevenly distributed, they may develop deviant modes of adaptation [4]. One such mode is *innovation*, in which people accept culturally prescribed goals, such as economic success, while rejecting institutionally legitimate means or replacing them with illegitimate alternatives. This framework shifts the analysis of deviance away from an exclusive emphasis on individual morality toward the relationship between individual action and the structure of available opportunities.

This framework is particularly relevant to illegal tin mining when earning an income remains an important economic objective while opportunities for stable employment, business capital, or access to legally authorized mining activities are not equally available to all groups. Illegal miners should therefore not be viewed solely as individuals who deliberately choose to violate the law, but also as actors making decisions within a particular structure of economic opportunities. Their actions remain illegal; however, a criminological analysis must also explain the conditions under which certain actors perceive illegal activities as available, feasible, or even rational economic alternatives.

Previous studies have examined illegal mining from economic, environmental, and legal perspectives. Research in Bangka Regency has shown that illegal community mining affects economic development while also creating supervision and governance challenges [5]. Other research has shown a strong relationship between the historical development of tin mining, post-mining reclamation, and environmental change in the Bangka Belitung Islands [6]. From a legal perspective, previous studies have emphasized the need for responsive law enforcement in addressing illegal mining in Indonesia [7]. Other studies have shown that illegal mining is linked to weaknesses in regulatory frameworks and their implementation [8]. In the international context, research in Ghana shows that illegal mining persists partly because it provides a livelihood for households that depend on mining activities [9]. Collectively, these studies have established important relationships among illegal mining, community livelihoods, regulation, law enforcement, and environmental impacts.

Nevertheless, an important research gap remains in explaining the micro-level mechanisms that connect economic pressure, limited access to legitimate means, and the decision to engage in illegal tin mining within a specific tin-mining community in Bangka. Previous studies have tended to focus on economic impacts at the regency level, environmental degradation, mining governance, or regulatory and law-enforcement challenges. These studies have not sufficiently explained how individual actors interpret economic goals, experience constraints in accessing legitimate means, adopt illegal mining as a form of adaptation, and subsequently reproduce such practices within the social environment of Kolong Buntu. The research gap therefore extends beyond differences in geographical location and concerns the criminological mechanisms linking economic structures to the emergence and persistence of deviant behavior.

Building on this gap, the novelty of the present study lies in the application of Merton's Anomie Theory to analyze deviant adaptation at the local level by examining the relationship among economic pressure, restricted access to legitimate means, the choice to engage in illegal tin mining, and processes of social normalization at Kolong Buntu. Rather than focusing exclusively on the consequences of illegal mining, this study shifts attention toward understanding why and through what social processes illegal mining continues to be reproduced despite its legal and ecological risks. This contribution extends the application of anomie theory to environmental criminology and illegal economies by positioning economic opportunity structures and actors' interpretations of their circumstances as central elements in explaining the persistence of environmental crime.

Against this background, the main research question is: How do economic pressure and limited access to legitimate means shape community involvement in illegal tin mining at Kolong Buntu, Sungailiat, when analyzed through Robert K. Merton's Anomie Theory? This main question is further divided into three sub-questions: (1) how do economic conditions and access to legal employment or legitimate sources of livelihood generate strain among the actors involved; (2) how do actors respond to such strain by engaging in illegal tin mining as a form of *innovation*; and (3) how is illegal mining reproduced and normalized through local social relations, and what are its implications for social control and the environment? Accordingly, this study aims to empirically explain these mechanisms to strengthen criminological understanding of illegal mining and provide an evidence-based foundation for prevention strategies that combine law enforcement with improved access to legitimate livelihood opportunities.

 https://doi.org/10.58421/gehu.v5i4.1736

2. METHOD

This study employed a qualitative approach with a case study design to examine economic pressure and social deviance in illegal tin mining at Kolong Buntu, Sungailiat, Bangka Regency. The case study design was selected because the research focused on a specific case bounded by location, actors, activities, and social context. This approach enabled an in-depth understanding of the actors' experiences, actions, and social meanings, as well as the relationships among economic pressure, limited access to legitimate means, illegal mining activities, social control, and environmental impacts [10]. A qualitative approach was also appropriate for exploring experiences and social interactions contextually through interviews, observations, and document analysis [11]. The study was conducted at Kolong Buntu and the surrounding residential areas from April to June 2026.

The study included 16 informants: five miners, four residents living around Kolong Buntu, two community leaders, three local government or village officials, and two law enforcement officers. The researchers purposively selected informants based on their involvement in, experience with, and knowledge of illegal tin mining activities and the socioeconomic conditions surrounding Kolong Buntu. Inclusion criteria required informants to be at least 18 years old, have direct experience with or substantive knowledge of tin mining activities at the study site, have knowledge of local socioeconomic conditions or mining-related impacts, and voluntarily agree to participate in the study.

During fieldwork, initial informants also referred the researchers to other potential participants. Accordingly, purposive sampling was subsequently complemented by snowball sampling. Initial informants who met the eligibility criteria facilitated access to other individuals with relevant experience or knowledge. This technique was particularly appropriate because actors associated with illegal activities constitute a hard-to-reach population, for whom no clearly defined sampling frame exists and who may prefer to remain anonymous or may be reluctant to identify themselves because of stigma or potential legal consequences. Snowball sampling relies on referrals within social networks and can facilitate access to hard-to-reach populations, although it is not intended to produce statistically generalizable findings [12].

Data were collected through in-depth interviews, field observations, and document review. These methods were intended to provide a comprehensive understanding of illegal mining through actors' experiences, actual field conditions, and available documentary evidence. Interviews enabled the researchers to obtain detailed accounts of informants' experiences and perspectives, while observations documented situations, interactions, and contextual conditions that might not emerge through interviews alone [13]. Previous research has also supported systematic observation and field documentation [14]. Interviews have similarly been employed as an important means of obtaining information and understanding community perspectives [15].

The researchers conducted face-to-face interviews with all 16 informants at mining sites, local residences, and, for several government and law enforcement informants, at their respective offices. The interviews were unstructured to allow informants to describe their experiences and perspectives openly. The interview topics focused on economic conditions and household needs, opportunities to obtain legal employment, reasons for involvement or non-involvement in illegal mining, perceptions of economic benefits, awareness of legal risks, relationships among mining actors, community responses, law enforcement, and changes in environmental conditions. With the informants' consent, interviews were recorded using a mobile phone and supplemented with field documentation. The recordings were subsequently transcribed verbatim for analysis.

Document review was conducted using materials directly related to the Kolong Buntu case. These materials included media reports on illegal mining activities, community resistance, and law enforcement actions; statistical documents published by Statistics Indonesia (*Badan Pusat Statistik*); mining and environmental policies; and scientific articles addressing illegal tin mining in the Bangka Belitung Islands. Documents were selected for their relevance to the study site, illegal mining activities, socioeconomic conditions, law enforcement, and environmental impacts from January 2024 to June 2026. Document analysis was not used as a substitute for field data but rather to provide contextual information and assess the consistency of evidence obtained through interviews and observations. Integrating interviews, observations, and document analysis as complementary sources of qualitative data aligns with established qualitative data-collection principles [16].

The data were analyzed using thematic analysis through a combination of deductive and inductive coding. The analytical process began with repeated readings of interview transcripts, field notes, and documents to develop a comprehensive understanding of the dataset. Following familiarization, relevant units of data were assigned initial codes. The codes were subsequently compared and grouped to identify patterns, categories, and themes that addressed the research questions. Thematic analysis provides a systematic process for identifying, developing, reviewing, and interpreting patterns of meaning within qualitative data [17]. Good practice in thematic analysis also requires a transparent connection between the empirical data, coding process, theme development, and researchers' interpretations [18].

Deductive coding was guided by Robert K. Merton's Anomie Theory, particularly the concepts of economic goals, access to legitimate institutional means, structural strain, and *innovation* as a mode of adaptation [19]. The deductive codes identified how informants described their goals of securing income and improving their well-being, the barriers they encountered in accessing legal employment or legitimate livelihoods, and their use of illegal mining as an alternative means of achieving economic goals. Inductive coding captured categories emerging directly from the data without being entirely constrained by the theoretical framework. These inductive categories included informal economic networks, normalization of illegal mining, dependence on tin mining, perceptions of legal risks, relationships with collectors or mining managers, community responses, social control, law enforcement, and environmental degradation. These categories were subsequently developed into analytical themes explaining the relationship between economic pressure and socially deviant practices.

The researchers conducted the analytical process manually, using Microsoft Excel to organize selected data. The researchers developed a matrix linking informant codes, quotations or data units, initial codes, categories, themes, data sources, and relevant concepts from Anomie Theory. This procedure enabled comparisons across the experiences of miners, residents, community leaders, government officials, and law enforcement officers, while

 https://doi.org/10.58421/gehu.v5i4.1736

also allowing the researchers to assess their consistency with observational and documentary evidence. Themes were identified not merely by how often particular statements occurred but by their relevance and interpretive significance in addressing the research questions. This approach is consistent with contemporary thematic analysis, which conceptualizes coding and theme development as interpretive processes that must remain systematically traceable [20].

The trustworthiness of the findings was strengthened through source and method triangulation. Source triangulation involved comparing information obtained from miners or former miners, residents, community leaders, local government officials, and law enforcement officers. For example, miners' accounts of limited employment opportunities and the need to secure income were compared with residents' and community leaders' assessments of local economic conditions. Residents' reports regarding mining activities and community concerns were compared with statements from government and law enforcement officials and with media reports documenting community resistance and enforcement actions. Method triangulation involved comparing interview findings with observations of conditions at Kolong Buntu and relevant documentary evidence. When informants reported that mining activities occurred close to residential areas, these accounts were cross-checked through field observations and supporting documents. Similarly, when informants referred to previous enforcement actions, their statements were compared with media reports or official documents recording such interventions. This concrete application of triangulation strengthened the credibility of the findings because the conclusions were not drawn from a single data source. Trustworthiness in qualitative research can be enhanced through credibility, triangulation, member checking, documentation of the analytical process, and examination of interpretive consistency [21].

Ethical considerations received particular attention because the study addressed illegal activities and information that could potentially expose informants to legal or social consequences. Prior to each interview, participants were informed about the purpose of the research, the intended use of the data, the voluntary nature of their participation, their right to decline to answer particular questions, and their right to withdraw from the study without consequences. Consent was obtained from each informant prior to participation. Research involving sensitive populations requires particular attention to power relations, protection from harm, privacy, and confidentiality to ensure that participation does not expose informants to additional risks [22].

Confidentiality was maintained by replacing informants' identities with codes: P01–P05 for miners, W01–W04 for residents, T01–T02 for community leaders, AP01–AP03 for government or village officials, and APH01–APH02 for law enforcement officers. Real names, detailed residential addresses, telephone numbers, personal relationships, specific mining-operation locations, and other potentially identifying information were excluded from the transcripts and manuscript. Identifying information was stored separately from the research data in a restricted-access folder. Interview quotations were selected with careful consideration of the risk of re-identification. These procedures were necessary because research involving sensitive issues requires ongoing protection of participants' privacy, confidentiality, and safety, not merely consent at the start of the study. Recent ethical literature in Indonesia likewise emphasizes the importance of building trust, maintaining privacy and confidentiality, and minimizing potential harm in qualitative research involving vulnerable populations or sensitive issues.

Interviews were conducted at mining sites, residents' homes, and government or law enforcement offices without individuals who could exert pressure on or influence informants' responses. The researchers did not ask participants to demonstrate ongoing illegal activities, identify other individuals involved, or disclose operational information unnecessary to answer the research questions. The researchers did not report information in detail that could increase legal risks or trigger social conflict.

3. RESULTS AND DISCUSSION

3.1. RESULTS

The findings were organized into five themes based on the data reduction and categorization process: economic pressure and livelihood insecurity; informal networks in illegal mining; community resistance and social disruption; environmental degradation at Kolong Buntu; and weak prevention and law enforcement challenges**.** These themes reflected recurring patterns identified across the accounts of miners, residents, community leaders, government officials, and law enforcement officers.

3.1.1. Economic Pressure and Livelihood Insecurity

The analysis of the miners' accounts indicates that involvement in tin mining was closely associated with income instability and limited access to employment that could provide a regular income. This pattern was evident in the informants' previous occupational backgrounds, which included daily labor, construction work, casual employment, plantation work, workshop employment, warehousing, and transportation services. Mining became an economic option when these previous occupations failed to provide sufficient income security to meet household needs over time. Communities in Bangka Regency remain economically attracted to tin mining because it can generate relatively immediate income when employment opportunities in other sectors are limited [23].

Economic pressure was not limited to low income; it also involved uncertainty about the availability of future employment. Working-age miners tended to weigh the risks of mining against daily economic needs. Consequently, the prospect of earning income quickly often outweighed legal risks that were not perceived as immediate. Similar patterns suggest that participation in illegal mining may be shaped by the need to sustain livelihoods when neither formal nor informal economic sectors provide adequate income security [24].

Differences in age and employment experience also revealed varying forms of dependence on mining. Younger miners tended to view mining as a way to earn income in the absence of permanent employment, whereas more experienced miners showed stronger dependence because their skills, work experience, and occupational networks were already established within the mining sector. This finding suggests that transitions from illegal mining to legal employment cannot rely solely on prohibition; they require alternative employment opportunities that match the skills and economic needs of different groups of miners.

Accounts from community leaders and government officials further reinforced this pattern. Income instability in the informal sector contributed to the continued perception of tin as an economically attractive resource. Existing livelihood alternatives did not always provide income levels, employment continuity, or accessibility comparable to mining. Economic pressure in the Kolong Buntu case should therefore be understood not merely in terms of poverty, but more broadly as livelihood insecurity that encourages individuals to seek income sources perceived as faster and more accessible.

3.1.2. Informal Networks in Illegal Mining

Accounts from miners, community leaders, and law enforcement officers indicate that illegal mining at Kolong Buntu did not operate through isolated individual actions. The activity required relationships among field workers, equipment managers, individuals coordinating mining operations, and parties collecting or purchasing mined tin. These relationships formed an informal economic network in which different actors performed distinct functions that sustained the production and distribution of mining outputs. Illegal mining structures involving economic, social, and political actors may become embedded in local social systems, making them more difficult to control through interventions focused solely on field-level miners [25].

The process through which workers entered mining activities also demonstrated the importance of social networks. Friendships, family connections, and introductions by individuals already working at the site served as pathways through which new workers gained access to mining employment. Workers without their own capital or equipment depended on groups that controlled the means of production, placing them in a different economic position from managers or actors controlling the sale of mining outputs.

This differentiation was also reflected in the limited influence of field workers over the sale of mined tin. Mining outputs tended to be collected and distributed through particular actors who already had established relationships with working groups. The continuity of illegal mining therefore depended not only on the ability to extract tin but also on the availability of markets that could convert mining outputs into income. The findings indicate that illegal mining networks operated across several stages, including labor recruitment, equipment provision, organization of mining activities, production, and marketing.

Recent research on illegal tin mining in Bangka Belitung similarly demonstrates that illegal mining economies involve relationships among multiple actors and are not limited to small-scale miners directly engaged in extraction [26]. This finding reinforces the importance of distinguishing lower-level mining workers from actors with the capacity to organize operations, provide capital, control equipment, or facilitate market access for mined tin. Enforcement measures directed only at field workers may therefore create only a temporary interruption because structures providing capital, equipment, and access to buyers may remain capable of recruiting new workers.

3.1.3. Community Resistance and Social Disruption

The analysis of residents living around Kolong Buntu revealed competing interests between the economic benefits of mining and the need to maintain environmental quality and residential well-being. Residents who were not economically involved in mining tended to identify machinery noise, changes in water conditions, increased movement of workers and equipment, and potential environmental damage as major concerns. Conversely, the economic benefits workers or families dependent on mining received contributed to divergent community attitudes toward the activity.

These differences produced a socially ambivalent situation. Residents could understand miners' economic motivations while simultaneously opposing mining when its consequences affected their living environment. Mining therefore generated an uneven distribution of benefits and burdens, with economic gains accruing to particular groups while the wider community experienced ecological and social consequences. Small-scale mining can pressure local resources and reshape community economic relations when mining profits conflict with the sustainability of other livelihood resources [27].

Table 1. Forms of Community Resistance and Social Disruption at Kolong Buntu

Aspect of Finding	Manifestation	Relevant Groups	Analytical Meaning
Resistance to mining activities	Some residents demanded that mining activities be terminated because they were considered disruptive to the environment and community life.	Residents and community leaders	Indicates the emergence of informal social control against illegal mining activities.
Noise	Mining machinery and equipment generated noise that disturbed residents' daily comfort.	Residents living near the site	Demonstrates that mining impacts are not exclusively ecological but also affect everyday quality of life.
Changes in water conditions	Residents observed declining water clarity and increased turbidity while mining activities were operating.	Residents around Kolong Buntu	Environmental changes provided an important basis for community resistance.
Movement of workers and equipment	Mining activities increased the movement of people, vehicles, and equipment into the Kolong Buntu area.	Residents living near the site	Increased activity intensified perceptions of disturbance and community discomfort.
Differences in economic interests	Some community members benefited economically from mining, whereas others primarily experienced its environmental consequences.	Miners, workers' families, and local residents	Generated ambivalence and divergent attitudes toward illegal mining.
Social tensions	Different views emerged between groups that accepted mining and those that opposed it.	Residents, mining workers, and community leaders	Indicates an unequal distribution of the benefits and burdens associated with mining.
Community complaints	Residents submitted objections to neighborhood authorities, government officials, or law enforcement agencies.	Residents and local government	Demonstrates the simultaneous use of formal and informal mechanisms of social control.

Table 1 demonstrates that community resistance to illegal mining was not driven solely by concerns about legality. Changes in environmental quality, noise, increased movement of workers and equipment, and unequal distribution of economic benefits shaped community attitudes toward the activity. Resistance became stronger when mining impacts affected basic needs and the everyday living environment.

Resistance among residents of Nangnung and the surrounding Kolong Buntu area also reflected the operation of informal social control against activities perceived as environmentally harmful. This control strengthened when residents shared similar perceptions of mining-related impacts. However, the effectiveness of informal social control could weaken when sections of the community received direct or indirect economic benefits from mining.

These divergent interests also explain why the mining issue did not produce a simple division between miners and the wider community. Some residents opposed the activity while still acknowledging the economic pressures experienced by workers, whereas others accepted mining because it created income opportunities. This situation frames illegal mining as an environmental justice issue, as its economic benefits and ecological risks are not proportionately distributed among affected communities. Green criminology conceptualizes environmental harm as extending beyond formal legal violations because communities, ecosystems, and future generations may experience its consequences [28].

3.1.4. Environmental Degradation at Kolong Buntu

Information provided by residents, miners, community leaders, and government officials revealed a relatively consistent pattern of physical environmental change. The most prominent conditions included increased water turbidity during mining operations, mud accumulation, changes to the pit lake banks, vegetation disturbance in particular areas, and increased noise from mining machinery. Changes in water quality were among the most readily observable indicators because Kolong Buntu had previously formed part of the community's living environment and daily activities.

Increased turbidity made some residents more cautious about, or led them to reduce, their use of the area. These findings indicate that the consequences of mining extend beyond mineral extraction because changes to water conditions and the physical landscape may affect the broader surrounding ecosystem. Research on tin mining in the Bangka Belitung Islands has demonstrated that open-pit mining contributes to changes in vegetation structure, soil degradation, biodiversity loss, and altered ecosystem functions, thereby requiring long-term post-mining rehabilitation strategies [29].

Disturbance to the banks of the pit lake and surrounding vegetation further indicated physical changes to the area. More intense mining equipment use was associated with greater disturbance to water and surrounding surfaces. These impacts matter because the ecological condition of Kolong Buntu affects not only environmental integrity but also the lives and safety of nearby communities. Environmental degradation in the Kolong Buntu case therefore cannot be separated from the broader issue of mining governance.

The gap between environmental protection standards and actual monitoring practices can create opportunities for mining activities that continue to cause ecological damage. Research on tin-mining regulation in the Bangka Belitung Islands has identified weaknesses in regulatory structures and environmental oversight mechanisms that may enable environmental degradation to persist [30]. Changes in water quality, vegetation, and the area's physical condition further show that the environmental burden of mining is not borne solely by individuals directly involved in mining activities.

Communities living near mining sites may experience harmful consequences even when they receive no direct economic benefits from the activity. Similar patterns in small-scale mining elsewhere in Indonesia suggest that inadequately managed mining can cause environmental pollution, health risks, safety concerns, and socioeconomic pressures on surrounding communities [31]. These findings underscore the importance of restoring Kolong Buntu after illegal mining activities have ceased. Restoration should not be limited to removing mining equipment; it should also address water quality, vegetation, bank stability, sedimentation, and the area's ecological and social functions.

3.1.5. Weak Prevention and Law Enforcement Challenges

Accounts from government officials and law enforcement officers indicate that ending mining activities at a particular point in time does not necessarily prevent their recurrence. Removing or dismantling mining equipment may immediately interrupt operations, but economic incentives, labor availability, managerial networks, and the continued presence of buyers may preserve the conditions under which illegal mining can resume.

This finding highlights the distinction between enforcement against the visible manifestation of illegal mining and prevention directed at the structures that enable the activity to operate. Enforcement may be less effective when it targets only equipment and workers found at mining sites without investigating those who organize the activity or the economic chain through which mining outputs are distributed.

Law enforcement against illegal mining therefore requires a responsive strategy that extends beyond terminating mining operations to addressing the factors that allow violations to recur [32]. Evidentiary requirements constitute another challenge because actors involved in management or marketing are not necessarily physically present at mining sites. Law enforcement officers must establish connections between individual actors and specific illegal conduct through legally admissible evidence. Consequently, extending investigations beyond field-level workers to higher-level actors requires a more complex investigative process.

Table 2 shows that law enforcement challenges at Kolong Buntu extend beyond arresting offenders. Major difficulties include sustaining surveillance, involving higher-level actors, disrupting markets for mined tin, strengthening institutional coordination, and addressing the economic factors that facilitate the recruitment of new workers. Surveillance is also constrained by the geographical scope of enforcement responsibilities, changing operational schedules, equipment mobility, and limited personnel. Mining activities may temporarily cease during enforcement operations but subsequently resume once surveillance intensity declines.

Table 2. Prevention and Law Enforcement Challenges in Illegal Mining at Kolong Buntu

Challenge	Condition Identified	Implications for Enforcement	Required Response
Recurrence after enforcement	Mining activities may resume after equipment is dismantled or operations are terminated.	Enforcement produces only temporary cessation.	Continuous monitoring following enforcement operations.
Focus on field workers	Field workers are easier to identify than actors organizing the activity.	The core structure of the network may remain intact.	Extend investigations to coordinators, managers, financiers, and buyers.
Evidentiary difficulties	Controlling actors are not always physically present at mining sites.	Investigation and evidence collection become more complex.	Strengthen investigations based on relationships among actors and transaction chains.
Changes in operating patterns	Timing, scale, location, and operational patterns may change when surveillance increases.	Mining activities become more difficult to detect.	Adaptive monitoring and greater use of community-based information.
Limited surveillance capacity	Law enforcement agencies must monitor large areas and multiple cases.	Continuous surveillance of a single site is difficult to maintain.	Interagency coordination and information sharing.
Network of tin buyers	Mined tin continues to have a market and can be readily converted into income.	Market demand maintains economic incentives for illegal mining.	Disrupt the purchasing and distribution chain of illegally mined tin.
Limited authority of local government	Village-level government primarily performs administrative, facilitative, and coordinating functions.	Local authorities cannot directly undertake criminal enforcement.	Strengthen coordination with the police and relevant technical agencies.
Limited livelihood alternatives	Miners continue to require income after enforcement operations.	Workers may return to mining or be replaced by new workers.	Provide legal employment and sustainable economic empowerment programs.
Community participation	Residents possess early information regarding changes in mining activities.	Community information can facilitate early detection.	Establish safe reporting mechanisms and ensure clear follow-up procedures.

Studies of illegal mining in Indonesia indicate that effective law enforcement remains constrained by regulatory weaknesses, coordination problems, policy implementation challenges, and limited capacity to maintain consistent surveillance [33]. Local government officials also face jurisdictional constraints. Village-level authorities may receive complaints, facilitate communication, collect information, and coordinate with relevant agencies, but they do not possess primary authority to conduct criminal investigations into illegal mining. Effective intervention therefore requires coordination among village administrations, subdistrict authorities, the regency government, law enforcement agencies, and technical institutions responsible for mining and environmental governance.

Institutional and coordination limitations may reduce the speed and effectiveness of responses when information-sharing mechanisms do not operate effectively. Experiences of illegal-mining enforcement in other parts of Indonesia similarly indicate that weak local regulation, limited public awareness, and insufficient deterrent effects may allow unauthorized mining to persist despite enforcement measures [34]. Long-term prevention should therefore integrate area surveillance, expanded investigations across the entire chain of actors, control over the purchase of mining outputs, and the creation of alternative livelihoods for workers. Law enforcement remains essential, but its effectiveness will remain limited when workers who lose their source of income can readily re-enter illegal mining through networks that remain operational.

3.2. DISCUSSION

3.2.1. Illegal Tin Mining as Innovative Adaptation and the Explanatory Limits of Anomie

The findings indicate that illegal tin mining at Kolong Buntu cannot be adequately understood as an individual act arising solely from a deliberate intention to violate the law. Economic pressure, employment instability, limited income, and unequal access to legal employment create structural conditions under which mining becomes an economic option for some workers. Robert K. Merton’s Anomie Theory explains that deviance may emerge when individuals continue to accept culturally prescribed goals of economic success while legitimate institutional means for achieving those goals are not equally available [35].

The concept of innovation provides a more specific explanation of this condition. Innovative adaptation occurs when socially valued goals, such as economic success, remain accepted while legitimate institutional means are replaced by alternatives that are normatively or legally unacceptable [36]. Illegal tin mining among economically vulnerable workers reflects this pattern because the goals of earning an income, meeting family needs, and sustaining economic life remain legitimate, while the means used to achieve them fall outside legally authorized mining mechanisms.

Anomie, however, must be interpreted cautiously to avoid treating all actors involved in illegal mining as a homogeneous group. The theory has greater explanatory power when applied to workers experiencing livelihood insecurity, limited access to permanent employment, insufficient capital, and restricted opportunities within the legal economy. Their position differs from that of actors who possess capital, control mining equipment, organize operations, manage workers, or have access to the purchasing and distribution of mining outputs.

These different positions generate variations in both motivations and benefits derived from illegal mining. Lower-level workers tend to engage in mining as a means of survival and income generation, whereas actors occupying controlling positions have greater capacity to obtain economic benefits through control over capital, labor organization, and market access. Anomie Theory should therefore not be applied to all actors on the assumption that they experience the same degree of economic constraint.

The findings instead extend the application of Merton's theory by demonstrating that structural strain operates unevenly within a single illegal economy. Workers may enter illegal activities because of restricted access to legitimate means, whereas actors with greater resources may capitalize on the availability of economically vulnerable workers and illegal opportunities to sustain profitable operations. This differentiation is criminologically important because it avoids two analytical errors: treating all miners as offenders with equal economic power or, conversely, portraying all actors as victims of structural strain.

3.2.2. Actor Differentiation and the Structure of Illegal Opportunities

The informal networks identified in the Kolong Buntu case demonstrate that innovative adaptation does not develop in a social vacuum. Illegal means become more accessible when an opportunity structure already exists that provides employment, equipment, coordination, technical knowledge, and channels for selling mining outputs. These conditions enable illegal mining to be reproduced even when particular workers leave the activity or operations at a specific location are terminated.

The distinction between workers, operational managers, and actors controlling economic access is directly related to previous studies of tin governance in the Bangka Belitung Islands. Research on tin governance has shown the complexity of relationships among communities, business actors, illegal miners, the state, economic interests, ecological degradation, and weaknesses in mining-policy implementation [37].

The findings from Kolong Buntu confirm previous studies regarding the complexity of actors and local dependence on the tin economy. This study extends earlier findings by revealing micro-level mechanisms through which illegal mining structures distinguish economically vulnerable workers from actors who control operations and economic chains. These differences indicate that illegal networks are not merely based on interpersonal relationships among miners but may develop into opportunity structures that facilitate deviant behavior.

Studies of marine mining conflicts in Bangka Regency have similarly identified actors with different interests and capacities, as well as an unequal distribution of resource benefits [38]. Findings from illegal mining at Kolong Buntu confirm these inequalities among actors while extending the discussion from conflicts over mining space to illegal economic structures that connect labor, operational management, and the marketing of mining outputs.

This differentiation has important implications for law-enforcement policy. Workers who can easily be replaced occupy a fundamentally different position from actors who control resources and economic access. Enforcement strategies that analytically treat all actors as a homogeneous group risk disrupting only the most visible elements of illegal mining while leaving intact the structures that continue to generate illegal opportunities.

3.2.3. Positioning the Findings in Relation to Studies from Bangka, Indonesia, and Ghana

Comparisons with previous studies show that the Kolong Buntu case shares several characteristics with illegal mining in other contexts while also adding analytical dimensions.

Research on environmental legal awareness in unconventional tin mining in the Bangka Belitung Islands has found that knowledge of licensing requirements and awareness of environmental damage do not automatically lead to the cessation of unauthorized mining activities [39].

The Kolong Buntu findings confirm that awareness of legal risks does not necessarily result in legal compliance. At the same time, these findings challenge prevention strategies that rely too heavily on legal awareness campaigns as their primary instrument. Legal knowledge alone is insufficient when economic structures continue to provide strong incentives for illegal mining and legal employment is perceived as inadequate for meeting economic needs.

Comparison with Ghana also reveals relevant patterns despite differences in mineral commodities and social contexts. Research on the formalization of artisanal and small-scale mining in Ghana found that illegal activities persisted despite various government interventions because formalization processes encountered institutional, procedural, economic, and social barriers [40]. The present findings confirm that enforcement and formalization strategies focused primarily on regulatory compliance do not necessarily eliminate the economic incentives associated with illegal activities. The Kolong Buntu case extends this explanation through an anomie perspective by demonstrating how an imbalance between economic goals and the availability of legitimate means may continue to supply workers to illegal mining networks. In this sense, recurring labor availability cannot be separated from structural conditions that make illegal opportunities economically meaningful to particular groups.

Recent research on galamsey in Ghana has also demonstrated connections among resource dependency, institutional weaknesses, power inequalities, and the unequal distribution of environmental benefits and harms [41]. The Kolong Buntu case confirms the argument that illegal mining cannot be reduced to individual poverty because these activities operate within broader social and economic structures involving actors with different levels of power. This study extends studies from Ghana by applying anomie to connect macro-level economic structures with individual decision-making. Economic dependency and weak governance provide the structural context, while innovative adaptation explains how some individuals continue to pursue economic goals through illegal means. Together, these dimensions show that explanations of illegal mining must connect structural conditions, networks, and individual actions.

3.3.4. Education as an Expansion of Legitimate Means and a Mechanism for Reducing Anomie

Education should be positioned as part of the mechanism for preventing anomie rather than as a supplementary program disconnected from the main criminological analysis. Legal education primarily provides knowledge about rules and regulations, whereas the central problem identified in this study concerns limited access to meaningful legal economic opportunities. Education should therefore expand to develop skills that can translate into employment, income, and economic mobility.

Applied education may reduce anomic pressure by creating institutional means that individuals can realistically use to achieve legitimate economic goals. Training programs that are not connected to employment opportunities, capital, certification, market access, or continued assistance do not address the imbalance between economic aspirations and legitimate opportunities. Educational programs become more relevant when they can transform miners' existing skills into capacities applicable to more stable forms of employment. Research on livelihood transformation among illegal gold-mining communities in Poboya shows that changes in livelihood strategies relate to access to social, economic, and environmental capital; motivation for change; institutional accessibility; and the availability of support for transitions to more sustainable forms of employment [42].

These findings reinforce the argument that educational interventions at Kolong Buntu should not be limited to raising awareness about the prohibition of illegal mining. Education should instead be designed as a pathway toward legitimate means through worker skills mapping, professional certification, operator or technical training, access to employment in construction and logistics, fisheries development, support for Micro, Small, and Medium Enterprises, and community participation in environmental rehabilitation. The connection to Anomie Theory becomes clearer under this approach. The objective of policy should not be to reduce people's aspirations for economic well-being, but rather to strengthen their capacity to achieve those aspirations through legitimate means. The more realistic the access to employment, capital, and markets becomes, the narrower the gap between economic goals and institutional means that produces anomic pressure.

3.3.5. Contributions to Environmental Criminology, Green Criminology, and Anomie Theory

The theoretical implications of this study extend beyond demonstrating the continued relevance of Merton's Anomie Theory. The Kolong Buntu case shows that deviant economic adaptation can generate harms extending beyond the relationship between offenders and the state. Water degradation, ecological landscape changes, disruption to surrounding communities, and the burden of environmental restoration demonstrate forms of victimization and harm that extend beyond violations of mining licensing regulations.

Green criminology shifts the analytical focus from whether an action is formally classified as a crime to who produces ecological harm, who benefits from environmentally harmful activities, and who ultimately bears the consequences. Research on extractivism demonstrates that environmental harms may be collective, persistent, and extend beyond narrow distinctions among criminal, social, and ecological harm [43]. This study's theoretical contribution therefore lies in integrating anomie analysis with green criminology.

Anomie Theory helps explain how structural pressure and limited access to legitimate economic means encourage innovative adaptation, while green criminology explains how these adaptive choices generate costs externalized to communities and ecosystems. This relationship can be represented as follows:

Structural pressure → limited legitimate means → innovative adaptation → reproduction through informal networks → social and ecological harms. This framework also provides a more complex understanding of offenders' positions. Field-level miners may simultaneously participate in activities that cause environmental harm while themselves remaining structurally vulnerable because they lack capital, stable employment, or control over distribution chains.

Actors who organize operations and control economic resources occupy a different position because they have greater capacity to capture profits while shifting legal, economic, and ecological risks to workers and surrounding communities. This differentiation enriches environmental criminological analysis by avoiding a simplistic distinction between "offenders" and "victims." Environmental harm within illegal extractive economies may emerge through unequal social relations in which actors with the least power participate in producing harm but do not necessarily receive the greatest economic benefits.

3.3.6. Practical Implications: Prevention Based on Actor Differentiation

The first practical implication is the need for alternative livelihood programs specifically targeted at economically vulnerable workers. Such programs should begin with assessments of workers' skills, household financial responsibilities, employment histories, and realistic occupational alternatives. Training should then be linked to professional certification, job placement, gradual capital support, business assistance, and market access so alternative employment can offer economic value that competes with mining income.

The second implication concerns the need to differentiate intervention strategies for vulnerable workers and controlling actors. Preventive measures and economic transition programs are more relevant to workers whose involvement is linked to livelihood insecurity, whereas monitoring and enforcement directed at organizers, capital providers, equipment controllers, and buyers should focus on their capacity to sustain illegal opportunity structures. This differentiation allows interventions to be more proportionate to actors' positions within the network.

The third implication is developing community-based monitoring. Residents around Kolong Buntu can be incorporated into early-detection mechanisms through safe reporting channels, systematic complaint-recording procedures, protection of informants' confidentiality, and requirements that authorities provide feedback on follow-up actions. Community-based approaches have greater potential to generate sustainable social control than enforcement operations initiated only after illegal activities have already become established [44].

The fourth implication is the need to control the tin distribution chain. Monitoring should not end at extraction sites because buyers provide the economic value that makes mining outputs profitable. Government agencies and relevant law-enforcement institutions need to establish mechanisms for tracing the origin of tin, strengthen oversight of purchases from sources whose legality cannot be verified, and connect field-level monitoring with surveillance of broader trading chains.

The fifth implication concerns the ecological restoration of Kolong Buntu as part of environmental crime prevention. After illegal mining ceases, assessments should follow of water conditions, sedimentation, bank stability, vegetation, and the area's functions for surrounding communities. Restoration programs can also provide temporary legal employment for affected communities, integrating ecological rehabilitation with strategies to reduce economic pressure.

Experience with the cessation of artisanal and small-scale mining in Bunikasih shows that changes in community perceptions, alongside the termination of mining activities, may occur alongside improvements in environmental pollution conditions, indicating that social and ecological restoration should not be treated as separate processes [45]. This integrated strategy shifts the policy orientation from merely stopping mining activities toward transforming the opportunity structures that allow illegal mining to recur. Law enforcement reduces the benefits and opportunities available to controlling actors; alternative livelihoods expand legitimate options for workers; community monitoring increases the likelihood of detection; distribution-chain controls restrict markets for illegally mined outputs; and environmental rehabilitation reduces the ecological damage already produced.

The theoretical and practical consequences of this approach are consistent with the interpretation of anomie adopted in this study. Prevention cannot simply require communities to abandon illegal means; it must also ensure that legitimate pathways toward economic goals are genuinely available, accessible, and capable of providing adequate livelihoods. Such an approach may reduce anomic pressure without overlooking the legal responsibility of organized actors who derive economic benefits from illegal tin mining.

4. CONCLUSION

This study shows that illegal tin mining at Kolong Buntu is driven by the interaction of livelihood insecurity, informal economic networks, environmental harm, and weak enforcement. Interview findings indicate that some miners entered illegal mining because of unstable income and limited access to legal employment, while actors controlling equipment, operations, and purchasing networks occupied stronger economic positions. Field findings also revealed water turbidity, mud accumulation, damage to pit banks and vegetation, machinery noise, and conflicting community attitudes toward mining.

The Kolong Buntu case strengthens Merton's Anomie Theory by showing that *innovative adaptation* more clearly explains economically vulnerable workers with limited access to legitimate means than controlling actors with greater resources and market access. The findings also extend anomie analysis into environmental and green criminology because illegal economic activities generate social and ecological harms beyond the offenders themselves. Practical responses should therefore combine alternative livelihoods for vulnerable workers, enforcement targeting managers, financiers, and buyers, community-based monitoring, control of tin distribution chains, and ecological restoration.

This study is limited by its focus on a single location, restricted access to higher-level actors in illegal mining networks, possible caution in informants' responses, and potential bias in media-based data used for triangulation. Future studies should examine financiers and operational controllers, trace tin distribution networks, and compare illegal mining sites across the Bangka Belitung Islands to identify similarities and differences in their economic, social, legal, and ecological dynamics.

REFERENCES

[1] BPS-Statistics of Bangka Regency. (2025). *Sungailiat District in Figures 2025*. BPS-Statistics of Bangka Regency.

[2] BPS-Statistics of Bangka Regency. (2026). *Bangka Regency in Figures 2026*. BPS-Statistics of Bangka Regency.

[3] Merton, R. K. (1938). Social Structure and Anomie. *American Sociological Review, 3*(5), 672–682. https://doi.org/10.2307/2084686.

[4] Merton, R. K. (1968). *Social Theory and Social Structure*. Free Press.

[5] Rahayu, D. P., Rahayu, S., Faisal, Wulandari, C., & Hassan, M. S. (2023). Implications of Illegal Community Mining for Economic Development in Bangka Regency, Indonesia. *Law Reform, 19*(2), 270–293. https://doi.org/10.14710/lr.v19i2.52866.

[6] Pratiwi, Narendra, B. H., Siregar, C. A., Iskandar, Mulyanto, B., Suwardi, Suryaningtyas, D. T., Dharmawan, I. W. S., Suharti, S., & Marsandi, F. (2025). Tin Mining and Post-Tin Mining Reclamation Initiatives in Indonesia: With Special Reference to Bangka Belitung Areas. *Land, 14*(10), 1947. https://doi.org/10.3390/land14101947.

[7] Redi, A. (2023). Responsive Law Enforcement in Preventing and Eradicating Illegal Mining in Indonesia. *Journal of Law and Sustainable Development, 11*(8), e01436. https://doi.org/10.55908/sdgs.v11i8.1436.

[8] Rohman, A., Hartiwiningsih, & Rustamaji, M. (2024). Illegal Mining in Indonesia: Need for Robust Legislation and Enforcement. *Cogent Social Sciences, 10*(1), 2358158. https://doi.org/10.1080/23311886.2024.2358158.

[9] Afriyie, K., Abass, K., Frempong, F., Arthur, B., & Gyasi, R. M. (2023). The Dynamics and Livelihood Implications of Illegal Mining in Ghana: A Critical Assessment. *Geographical Research, 61*(1), 90–105. https://doi.org/10.1111/1745-5871.12573.

[10] Miller, E. M., Porter, J. E., & Barbagallo, M. S. (2023). Simplifying Qualitative Case Study Research Methodology: A Step-by-Step Guide Using a Palliative Care Example. *The Qualitative Report, 28*(8), 2364–2386. https://doi.org/10.46743/2160-3715/2023.6474.

[11] Chand, S. P. (2025). Methods of Data Collection in Qualitative Research: Interviews, Focus Groups, Observations, and Document Analysis. *Advances in Educational Research and Evaluation, 6*(1), 303–317. https://doi.org/10.25082/AERE.2025.01.001.

[12] Raifman, S., DeVost, M. A., Digitale, J. C., Chen, Y. H., & Morris, M. D. (2022). Respondent-Driven Sampling: A Sampling Method for Hard-to-Reach Populations and Beyond. *Current Epidemiology Reports*, *9*, 38–47. https://doi.org/10.1007/s40471-022-00287-8.

[13] Chand, S. P. (2025). Methods of Data Collection in Qualitative Research: Interviews, Focus Groups, Observations, and Document Analysis. *Advances in Educational Research and Evaluation, 6*(1), 303–317. https://doi.org/10.25082/AERE.2025.01.001.

[14] Zanariyah, S. (2024). Effective and Efficient Observation in Community Service Activities. *Jurnal Pengabdian Multidisiplin, 4*(3), 1–4. https://doi.org/10.51214/002024041159000.

[15] Budiarti, A. M., Agnesia, E. F., Puspita, E., Dewi, F. A., Sianipar, N., Amanda, S., M, V., & Erdita. (2024). Community Development: Observation and Interview Report of Pulau Betung Village, Pemayung District. *Journal of Dialogos, 1*(1), 1–9. https://doi.org/10.62872/4xggrn64.

[16] Chand, S. P. (2025). Methods of Data Collection in Qualitative Research: Interviews, Focus Groups, Observations, and Document Analysis. *Advances in Educational Research and Evaluation, 6*(1), 303–317. https://doi.org/10.25082/AERE.2025.01.001.

[17] Ahmed, S. K., Mohammed, R. A., Nashwan, A. J., Ibrahim, R. H., Abdalla, A. Q., Ameen, B. M. M., & Khdhir, R. M. (2025). Using Thematic Analysis in Qualitative Research. *Journal of Medicine, Surgery, and Public Health, 6*, 100198. https://doi.org/10.1016/j.glmedi.2025.100198.

[18] Braun, V., & Clarke, V. (2023). Toward Good Practice in Thematic Analysis: Avoiding Common Problems and Be(com)ing a Knowing Researcher. *International Journal of Transgender Health, 24*(1), 1–6. https://doi.org/10.1080/26895269.2022.2129597.

[19] Merton, R. K. (1968). *Social Theory and Social Structure*. Free Press.

[20] Braun, V., & Clarke, V. (2023). Toward Good Practice in Thematic Analysis: Avoiding Common Problems and Be(com)ing a Knowing Researcher. *International Journal of Transgender Health, 24*(1), 1–6. https://doi.org/10.1080/26895269.2022.2129597.

[21] Ahmed, S. K. (2024). The Pillars of Trustworthiness in Qualitative Research. *Journal of Medicine, Surgery, and Public Health, 2*, 100051. https://doi.org/10.1016/j.glmedi.2024.100051.

[22] Yumasdaleni, Kustini, Sofanudin, A., Wahab, A. J., Zuhrah, F., Atieqoh, S., & Warnis. (2026). Navigating Ethical Dilemmas in Qualitative Research with Vulnerable Groups in Indonesia. *Journal of*

Empirical Research on Human Research Ethics, 21(3), 148–160. https://doi.org/10.1177/15562646261432837.

[23] Rahayu, D. P., Rahayu, S., Faisal, Wulandari, C., & Hassan, M. S. (2023). Implications of Illegal Community Mining for Economic Development in Bangka Regency, Indonesia. *Law Reform, 19*(2), 270–293. https://doi.org/10.14710/lr.v19i2.52866.

[24] Afriyie, K., Abass, K., Frempong, F., Arthur, B., & Gyasi, R. M. (2023). The Dynamics and Livelihood Implications of Illegal Mining in Ghana: A Critical Assessment. *Geographical Research, 61*(1), 90–105. https://doi.org/10.1111/1745-5871.12573.

[25] Asori, M., Mpobi, R. K. J., Morgan, A. K., Apoanaba, T. A., Katey, D., Ampofo, S. T., Julius, O., & Appiah, D. O. (2023). Is Illegal Mining Socio-Politically Entrenched? An Opinion Piece of the Interaction between Formal Politics and Chief Dominance in Mineral Governance, and Its Influence on Fighting Galamsey in Ghana. *GeoJournal, 88*, 1953–1963. https://doi.org/10.1007/s10708-022-10725-1.

[26] Rahayu, D. P., Rustamadji, M., Faisal, & Sari, R. (2025). Illegal Tin Mining, Policy Gaps and the Plight of Small-Scale Tin Miners in Indonesia. *South East Asia Research*. https://doi.org/10.1080/0967828X.2025.2462727.

[27] Addai, H., Adjei, K. J., Eshun, B., Chemah, D. N., & Appiah, W. (2024). Interrogating the Impact of Illegal Artisanal and Small-Scale Mining on Agriculture at East Akim Municipality. *ACC Journal, 30*(3), 97–110. https://doi.org/10.2478/acc-2024-0010.

[28] Widodo, A., & Supardi. (2025). Green Criminology: Evolution, Typology, and Legal Framework for Environmental Protection. *Indonesian Private Law Review, 6*(1), 1–18. https://doi.org/10.25041/ip.v6i1.4444.

[29] Pratiwi, Narendra, B. H., Siregar, C. A., Iskandar, Mulyanto, B., Suwardi, Suryaningtyas, D. T., Dharmawan, I. W. S., Suharti, S., & Marsandi, F. (2025). Tin Mining and Post-Tin Mining Reclamation Initiatives in Indonesia: With Special Reference to Bangka Belitung Areas. *Land, 14*(10), 1947. https://doi.org/10.3390/land14101947.

[30] Haryadi, D., Ibrahim, I., & Darwance, D. (2023). Ecological Idealism in the Regulation of Tin Mining in Bangka Belitung: Reasoning about Crucial Articles. *Journal of Sustainability Science and Management, 18*(9), 17–37. https://doi.org/10.46754/jssm.2023.09.003.

[31] Meutia, A. A., Lumowa, R., & Sakakibara, M. (2022). Indonesian Artisanal and Small-Scale Gold Mining: A Narrative Literature Review. *International Journal of Environmental Research and Public Health, 19*(7), 3955. https://doi.org/10.3390/ijerph19073955.

[32] Redi, A. (2023). Responsive Law Enforcement in Preventing and Eradicating Illegal Mining in Indonesia. *Journal of Law and Sustainable Development, 11*(8), e01436. https://doi.org/10.55908/sdgs.v11i8.1436.

[33] Rohman, A., Hartiwiningsih, & Rustamaji, M. (2024). Illegal Mining in Indonesia: Need for Robust Legislation and Enforcement. *Cogent Social Sciences, 10*(1), 2358158. https://doi.org/10.1080/23311886.2024.2358158.

[34] Saputri, L. (2024). Environmental Law Enforcement on Illegal Rock Mining in Indonesia: A Case Study of Bone Regency. *Constitutional Law Review, 3*(1), 51–64. https://doi.org/10.30863/clr.v3i1.5638.

[35] Merton, R. K. (1938). Social Structure and Anomie. *American Sociological Review, 3*(5), 672–682. https://doi.org/10.2307/2084686.

[36] Merton, R. K. (1968). *Social Theory and Social Structure*. Free Press.

[37] Ibrahim, I., Haryadi, D., & Wahyudin, N. (2023). The New Political Governance of Tin Management in Bangka Belitung Islands, Indonesia: Local Elites' Perspective. *Journal of Sustainability Science and Management, 18*(9), 123–142. https://doi.org/10.46754/jssm.2023.09.009.

[38] Sulaiman, A., Muliawan, L. O. M., Ferdian, K. J., & Akbar, M. Y. (2023). Fighting over the Bangka Sea: The Tin Mining Conflict in the Marine Area of Bangka Regency. *Journal of Governance, 8*(1), 61–75. https://doi.org/10.31506/jog.v8i1.18814.

[39] Haryadi, D., Ibrahim, I., & Darwance, D. (2022). Environmental Law Awareness as Social Capital Strategic in Unconventional Tin Mining Activities in the Bangka Belitung Islands. *Society, 10*(2), 665–680. https://doi.org/10.33019/society.v10i2.455.

[40] Wireko-Gyebi, R. S., Braimah, I., Anaafo, D., Moomen, A.-W., & Lykke, A. M. (2025). Challenges Associated with Formalising Artisanal Small-Scale Mining in Ghana. *SAGE Open, 15*(2). https://doi.org/10.1177/21582440251341054.

[41] Damoah, B., & Boglo, R. (2026). Resource Curse and Sociospatial Implications of Artisanal Gold Mining in Ghana. *Discover Environment, 4*, 42. https://doi.org/10.1007/s44274-026-00526-5.

[42] Ardikoesoema, N., & Karuniasa, M. (2025). Assessing the Transformation of Livelihoods in Illegal Gold Mining Communities. *Journal of Environmental Science and Sustainable Development*, *8*(1), 304–332. https://doi.org/10.7454/jessd.v8i1.1353.

[43] Boukli, A., & Kotsakis, A. (2023). Transversal Harm and Zemiology: Reconsidering Green Criminology and Mineral Extractivism in Cerro de Pasco, Peru. *Critical Criminology, 31*(4), 1113–1136. https://doi.org/10.1007/s10612-023-09715-7.

[44] Lumowa, R., Utomo, S. W., Soesilo, T. E. B., & Hariyadi, H. (2022). Promote Social Order to Achieve Social and Ecological Justice for Communities to Prevent Illegal Artisanal Small-Scale Gold Mining. *Sustainability, 14*(15), 9530. https://doi.org/10.3390/su14159530.

[45] Kurniawan, I. A., Kyaw, W. T., Abdurrachman, M., Kuang, X., & Sakakibara, M. (2023). Change in Values of Illegal Miners and Inhabitants and Reduction in Environmental Pollution after the Cessation of Artisanal and Small-Scale Gold Mining: A Case of Bunikasih, Indonesia. *International Journal of Environmental Research and Public Health, 20*(17), 6663. https://doi.org/10.3390/ijerph20176663.