From Extraction to Attraction: Understanding the Socio-Economic and Environmental Interplay of Tin Mining and Tourism

Echo Perdana Kusumah1*, Ibrahim Ibrahim2, Nanang Wahyudin3, and Eva Utami4
1,3Universitas Bangka Belitung, Management Science Department, 33172 Bangka, Indonesia
2Universitas Bangka Belitung, Social Science Department, 33172 Bangka, Indonesia
3Universitas Bangka Belitung, Marine Science Department, 33172 Bangka, Indonesia

Abstract. The objective of this study is to gain a thorough understanding of the dynamic relationship between the tin mining industry and tourism in the Bangka Belitung Province of Indonesia. This study utilizes qualitative research methods. Findings revealed that there are challenges associated with the relationship between tin mining and tourism in the Province. The process of transitioning from extraction to attraction necessitates meticulous planning and collaboration among different stakeholders, such as local communities, government entities, private enterprises, and non-governmental organizations. Ensuring the long-term sustainability of both industries requires a paramount focus on balancing economic interests with environmental protection. This study highlights the importance of adopting a comprehensive approach to sustainable development in the Bangka Belitung Province. It is crucial for policymakers to give utmost importance to responsible mining practices and implement strict environmental regulations. At the same time, they should also focus on promoting investment in tourism infrastructure and enhancing capacity building. The collaboration between the mining and tourism sectors has the potential to generate innovative solutions that can bring benefits to the local economy, while also preserving cultural heritage and safeguarding the environment.

1 Introduction

In the past few decades, there has been a noticeable change in resource-driven regions around the world. Traditional extraction industries in these areas are now being seen as potential tourist attractions. Tin mining is a prominent example among these industries, known for its historical significance and vital role in economic development. Tin mining in specific regions made a significant contribution to the growth of Gross Domestic Product (GDP) and the reduction of poverty [1]. In addition to the economic benefits, researchers have expressed concerns about the social disruptions and community transformations that can result from mining activities. Studies found that the social dynamics within a tin mining
region, rising income inequality and shifts in traditional livelihoods [2,3]. In addition, the arrival of temporary labor forces can put pressure on local infrastructures and social cohesion [4].

Considerable investigation has been conducted on the environmental impact of tin mining. Numerous studies have brought attention to the significant land degradation, deforestation, and habitat loss that occur as a direct consequence of mining operations. The tin mining area highlighted the importance of considering the long-term effects of soil erosion and ecosystem disruption [5]. Mining activities are a major cause for concern when it comes to water pollution. Studies have shown that nearby water bodies can become contaminated with heavy metals and chemicals from tailings, which can have a negative impact on aquatic life and human health [6].

The development of tourism can play a crucial role in diversifying economies by generating job opportunities and stimulating local businesses [7]. Strategic tourism planning can also contribute to the preservation of culture and promote community engagement [8]. However, the process of transitioning from extraction to attraction poses certain challenges. Scholars have recognized the importance of implementing effective destination branding and marketing strategies in order to transform the perception of regions from being known solely for their mining landscapes to becoming attractive tourist destinations [9,10]. The issue of balancing economic growth with environmental preservation is still a significant concern, and various studies highlight the crucial role of sustainable tourism practices [11,12].

Tourism initiatives that are well-designed have the potential to generate alternative sources of income and enhance the well-being of communities in former mining regions [13]. One crucial area of exploration focuses on the potential of tourism to contribute to environmental conservation and restoration in former mining areas. The integration of eco-tourism and responsible tourism practices is essential for the preservation of natural habitats and ecosystems [14]. In addition, by integrating environmental education and sustainable tourism practices, we can effectively increase awareness among both tourists and local communities [15].

The objective of this paper is to explore the complex relationship between extraction-focused economies and tourism-driven ones, examining the opportunities and challenges that arise during this transition. By conducting a thorough examination of empirical data and existing literature, our goal is to offer a comprehensive understanding of the interconnected socio-economic and environmental factors involved. In addition, our goal is to provide practical suggestions and strategies for policymakers, businesses, and local communities to responsibly and sustainably navigate this transformative process.

1.1 Study Area

Bangka Belitung is a province in Indonesia that comprises two primary islands, Bangka and Belitung, as well as a number of smaller islands. The province has a rich history of being recognized for its plentiful tin deposits, making it a significant contributor to the global tin mining industry [3]. In recent years, there has been an increasing focus on promoting tourism as a supplementary economic driver to complement the mining sector [14]. Tin mining in Bangka Belitung has a long history that dates back centuries. During the colonial era, the region gained international recognition as a significant tin-producing area [16]. Tin mining operations have had a significant impact on the local economy by creating employment opportunities and contributing to national revenue. Currently, Bangka Belitung is considered one of the most important regions for tin production worldwide. The islands are home to a large number of mining operations that are responsible for extracting this valuable resource. The extraction of tin remains a crucial economic activity in the province, supporting a significant portion of the population's livelihoods.
The provincial government has been actively promoting tourism as a viable economic alternative, recognizing the need for economic diversification and sustainable development. Bangka Belitung serves as an appealing destination for both domestic and international tourists due to its pristine coastal landscapes, beautiful white sandy beaches, and rich cultural heritage. The development of tourism in Bangka Belitung faces various challenges. A major concern is to ensure that tourism practices are sustainable and do not have a negative impact on the environment and local communities. Careful planning is necessary to prevent potential conflicts between the development of tourist infrastructure and the conservation of natural resources.

2 Methods

Through the utilization of qualitative research methods, our objective is to acquire a comprehensive comprehension of the socio-economic consequences and environmental ramifications associated with the shift from economies centered around extraction to those driven by tourism. Semi-structured interviews were conducted with key stakeholders, encompassing local community members, government officials, representatives from mining companies, tourism authorities, and environmental experts. The interviews will seek to examine the viewpoints, personal encounters, and understandings of individuals in relation to the socio-economic and environmental dimensions of tin mining and tourism. The utilization of open-ended questions will serve as a means to stimulate participants to offer comprehensive and unrestricted responses, thereby enabling them to freely articulate their perspectives.

Furthermore, field observations were conducted at specific mining sites and tourist destinations in order to acquire direct and firsthand understanding of the actual conditions on the ground. The primary focus of the observations will be directed towards the examination of mining practices, their environmental repercussions, and the intricate dynamics that emerge from the interactions between tourists, local communities, and the natural environment.

Finally, a comprehensive review conducted on the available documents, reports, and literature pertaining to tin mining, tourism, and the environmental impact in the region of Bangka Belitung. The aforementioned categories encompass a range of sources, namely official government documents, evaluations of environmental consequences, strategies for the growth of tourism, and scholarly articles. The utilization of document analysis as a research method offers valuable contributions to the study by providing a historical framework, policy perspectives, and existing research discoveries that enhance the primary data.

3 Results and discussion

3.1 Socio-Economic Impact of Tin Mining

According to the study, tin mining has played a crucial role in providing employment opportunities in the Bangka Belitung Province. Mining-related activities provide local residents with livelihood opportunities, either directly or indirectly, involving a significant portion of the community. However, there have been concerns raised regarding the seasonal nature of mining jobs and the resulting lack of stable income for certain miners. Tin mining has made a significant contribution to the economy of the province, accounting for a substantial portion of its GDP. The revenue generated from mining activities has been effectively utilized to finance infrastructure projects and social programs, resulting in
enhanced living standards for certain communities [17]. However, the province's economic diversification and stability are at risk due to the excessive dependence on mining revenues. The study brought attention to the unequal distribution of wealth within the province, as certain communities were found to benefit more from mining activities than others. Some regions underwent significant economic growth, while others remained relatively underdeveloped. The existing imbalance has the potential to result in social tensions and exacerbate the income gap.

The local communities have experienced social and cultural changes as a result of the increase in mining activities [18]. Traditional practices and cultural heritage have encountered difficulties as a result of an increasing number of individuals from outside communities and shifts in livelihoods. Moreover, the swift growth of mining operations has placed a burden on social services and infrastructure, resulting in adverse impacts on community cohesion. During on-site observations and interviews, it was discovered that there are concerns regarding occupational health and safety in mining operations. Several miners have reported health issues that are believed to be linked to their exposure to hazardous substances. Additionally, it has been observed that safety standards are not consistently enforced across all mining sites. The study's findings reveal that tin mining in Bangka Belitung Province has notable socio-economic implications. Although it does offer employment opportunities and contribute to the local economy, there are concerns regarding wealth disparities, social changes, and environmental degradation. Policymakers and stakeholders must prioritize addressing these issues by implementing sustainable mining practices, enhancing regulation, and initiating community development initiatives.

In order to strike a harmonious balance between economic growth and environmental preservation, it is crucial for Bangka Belitung Province to consider exploring alternative livelihood opportunities. One potential avenue worth exploring is sustainable tourism, which can help reduce the region's reliance on tin mining. To mitigate the negative impact of tin mining, it is important to implement strict environmental regulations, promote responsible mining practices, and involve local communities in decision-making processes.

3.2 Environmental Consequences of Tin Mining

During the on-site observation, it became clear that tin mining activities have caused substantial deforestation and destruction of habitats. Extensive tracts of vibrant forests have been cleared to accommodate open-pit mining, leading to the unfortunate consequences of biodiversity loss and disturbance to fragile ecosystems. During the on-site observation, it was clear that tin mining activities have caused substantial deforestation and habitat destruction. Extensive tracts of vibrant forests have been cleared to accommodate open-pit mining, leading to the unfortunate consequences of biodiversity loss and disturbance to fragile ecosystems. Residents living near mining sites expressed increasing concerns about water pollution during in-depth interviews. The improper disposal of waste in tin mining operations has resulted in the contamination of nearby water bodies, leading to negative effects on public health. The study also revealed that tin mining in coastal areas has contributed to the increased occurrence of coastal erosion and land subsidence. The vulnerability of coastal communities, particularly fishermen, has been heightened as a result. During interviews conducted with local communities, it became evident that tin mining activities have had significant social disruptions. Furthermore, the process of relocating individuals and acquiring land has led to conflicts and the breakdown of social cohesion.

The impact of tin mining in Bangka Belitung Province on the environment highlights a notable deficiency in the enforcement of environmental regulations. The findings indicate that there is a need to enhance the enforcement of current laws in order to address deforestation, pollution control, and responsible mining practices. In order to address the
environmental impacts of tin mining, it is crucial to prioritize the implementation of sustainable mining practices [1]. This involves the implementation of reclamation and rehabilitation programs aimed at restoring degraded land, as well as the promotion of eco-friendly technologies to minimize pollution. Community engagement plays a vital role in effectively addressing the social disruptions that arise from mining activities [19]. Fostering social acceptance and minimizing conflicts in mining can be achieved by involving local communities in decision-making processes and ensuring their participation in the benefits of mining revenues.

Maintaining biodiversity and ecological balance in the region is crucial, which is why it is essential to conserve and restore ecosystems that have been impacted by tin mining. Collaboration between the government and mining companies is crucial in order to establish protected areas and effectively implement restoration projects, thereby mitigating the loss of habitats. In order to address the issue of the region's excessive dependence on tin mining, it is crucial to prioritize the promotion of sustainable economic diversification. By focusing on the development of eco-tourism, agriculture, and renewable energy industries, we can not only create alternative sources of income but also ensure the preservation of the environment.

3.3 Tourism as a Socio-Economic and Environmental Alternative

Several positive socio-economic impacts of tourism have been revealed through in-depth interviews conducted with local residents, business owners, and government officials. Tourism has brought about a significant increase in job opportunities, particularly in the hospitality and service sectors, thereby creating livelihoods for the local population. Moreover, the tourism industry has played a significant role in fostering the expansion of small and medium-sized enterprises, thereby promoting entrepreneurship and enhancing the diversification of the region's economy. The interviews have also revealed that tourism has had a positive impact on the overall standard of living in the province, as well as reducing reliance on the unpredictable tin mining industry.

We conducted on-site observations in important tourist destinations to examine the environmental consequences of tourism development. The findings indicate that the rapid growth of tourism has led to an uncontrolled increase in waste production, which has placed a burden on the region's waste management facilities. Furthermore, the expansion of tourist facilities has resulted in the encroachment upon ecologically sensitive areas, posing a significant threat to biodiversity and natural habitats. Irresponsible snorkeling and diving practices have had negative impacts on the local marine ecosystems, especially coral reefs.

Through document analysis and interviews, it was discovered that there are significant challenges when it comes to striking a balance between socio-economic benefits and environmental preservation in Bangka Belitung Province. A major challenge that exists is the absence of comprehensive policies and regulations pertaining to sustainable tourism. The lack of clear guidelines has resulted in the occurrence of unsustainable development, posing a threat to the natural resources of the province. Furthermore, the implementation of effective environmental conservation measures has been hindered by limited financial resources and expertise [20].

Insights into the local community's perception of tourism as an alternative socio-economic driver were gained through interviews, allowing for a comprehensive exploration of community perspectives. While some individuals expressed optimism regarding the economic opportunities that tourism brings, others raised concerns about the potential negative impact on traditional culture and the commercialization of local heritage. The importance of involving local communities in decision-making processes is emphasized by the findings, as it ensures that their interests are properly represented and protected.
The on-site observations revealed that there is a clear need to improve environmental awareness and education among both tourists and local residents. Potential solutions to mitigate the negative impacts of tourism include initiatives such as eco-tourism programs, environmental workshops, and responsible tourism campaigns. By promoting a strong sense of environmental stewardship, these initiatives can inspire visitors and stakeholders to embrace sustainable practices.

The study's findings suggest several policy recommendations to enhance sustainable tourism development in Bangka Belitung Province. One important aspect is the development of a robust and effectively implemented sustainable tourism framework. This framework should aim to strike a balance between socio-economic interests and environmental protection. In addition, it is crucial to promote public-private partnerships that focus on investing in sustainable infrastructure, waste management, and conservation efforts. Finally, by implementing capacity-building programs and engaging stakeholders, local communities can be empowered to actively participate in the planning and decision-making processes of tourism.

3.4 The Interplay of Tin Mining and Tourism

Through conducting in-depth interviews with local community members, it was revealed that tin mining holds a crucial position in the economy of the province. Several respondents mentioned that the mining industry has created both direct and indirect employment opportunities. However, there were concerns raised regarding income disparities and the potential exploitation of labor in specific mining operations. During our on-site visits to mining sites, it became clear that mining activities have played a significant role in the development of infrastructure in the region. Local communities have experienced positive impacts on their access to basic amenities due to the presence of improved roads and transportation networks. According to government records, there has been a consistent stream of revenue from tin mining activities in Bangka Belitung Province. This revenue has played a crucial role in funding a range of development projects and public services.

Local residents have raised concerns about the environmental impact of tin mining, specifically focusing on issues such as deforestation, water pollution, and habitat destruction. They emphasized the importance of implementing more stringent environmental regulations and improving enforcement measures to effectively tackle these issues. During our on-site visits, we observed clear signs of deforestation and soil erosion in areas that had been subjected to mining activities. In addition, it was observed that water bodies in close proximity to mining sites showed clear indications of contamination, which had detrimental effects on both the aquatic ecosystem and the local community's water sources. The ecological impact of tin mining has been well-documented in official reports and environmental assessments. These findings highlight the importance of implementing sustainable mining practices and undertaking environmental rehabilitation initiatives.

During interviews with various tourism stakeholders, such as local entrepreneurs and government officials, it became evident that there is significant untapped potential for tourism in Bangka Belitung Province. The province's significant assets for tourism development were identified as its natural beauty and rich cultural heritage. During our on-site observation, we noticed the presence of various potential tourist attractions, including pristine beaches, traditional villages, and historical sites. The growth of the tourism sector was hindered due to insufficient infrastructure and lack of promotion. Previous studies and tourism development plans have highlighted the importance of strategic investments in tourism infrastructure, marketing, and community engagement in order to fully tap into the province's tourism potential [21,22].
The results suggest that tin mining plays a significant role in the province's economy; however, it also presents environmental challenges. It is crucial to strike a balance between economic benefits and environmental conservation. By implementing sustainable mining practices, such as reforestation and proper waste management, we can effectively reduce the ecological impact caused by mining activities. Exploring sustainable tourism strategies can offer local communities alternative sources of income without placing additional strain on the environment. The study emphasizes the significance of both enforcing current environmental regulations and implementing additional measures to guarantee responsible mining practices. Regular monitoring and compliance checks are crucial in order to prevent any further degradation of the environment. In the same vein, it is important to establish clear guidelines for the development of sustainable tourism. This will help ensure that the growth of tourism is in harmony with the preservation of natural resources and cultural heritage.

It is crucial to involve local communities in decision-making processes related to mining and tourism activities. Promoting active community involvement in the planning and utilization of these industries can contribute to the achievement of inclusive and sustainable development. To promote community ownership and enhance the cultural experience for tourists, it is essential that tourism projects are designed with the active participation of local stakeholders. The relationship between tin mining and tourism in Bangka Belitung Province offers potential for synergy. One example of repurposing abandoned mining sites is through their rehabilitation for sustainable tourism. These sites can offer distinctive attractions that seamlessly combine natural landscapes with historical elements. Raising awareness of the environmental challenges posed by the mining industry could be achieved by involving tourists in educational programs that focus on responsible mining practices.

In order to utilize tourism as a viable alternative to mining, it is essential to implement strategic marketing efforts and make investments in infrastructure. Enhancing transportation, accommodation, and other amenities can greatly improve the overall tourist experience and serve as a magnet for attracting more visitors. Effective collaboration between government agencies, private sector stakeholders, and local communities is crucial in addressing these needs.

### 3.5 Opportunities and Challenges for Transformation

The interviews have uncovered that the Bangka Belitung Province holds considerable untapped economic opportunities that go beyond tin mining. The respondents emphasized the potential of eco-tourism, marine-based industries, and sustainable agriculture. The province's breathtaking natural landscapes and abundant marine biodiversity have been recognized as valuable assets for promoting tourism and attracting investments in related industries. Based on on-site observations, it has been noted that certain local communities have taken steps to diversify their economic activities in order to decrease their reliance on tin mining. Entrepreneurs at a small scale have been making investments in businesses related to tourism, including homestays, guided tours, and handicraft production. These initiatives showcase the potential of the region to shift from an economy primarily reliant on extraction to one that is more diversified. During interviews with government officials, the focus was on ongoing infrastructure development projects. These projects have a clear objective of enhancing transportation, connectivity, and accessibility to remote areas within the province. The anticipated infrastructure improvements are expected to enhance tourism growth and attract a larger number of investors to the region.

The analysis of the document indicates that there are ongoing efforts to promote sustainable mining practices in Bangka Belitung. Several mining companies have taken steps to mitigate environmental impacts and enhance working conditions. Nevertheless, there are still obstacles to overcome in order to achieve widespread implementation of these practices.
throughout the mining industry. During our on-site observations, we noticed that there are local conservation initiatives in place that are specifically aimed at preserving the unique biodiversity and cultural heritage of the province. Non-governmental organizations and community-based groups play an active role in promoting environmental protection and raising awareness through various campaigns.

The findings indicate that expanding the economy beyond tin mining holds great potential for achieving sustainable development in Bangka Belitung Province. The region can attract more tourists and investments in eco-friendly industries by leveraging its natural beauty and marine resources. However, it is important to engage in careful planning in order to achieve a balance between tourism development and conservation efforts. This is necessary to prevent any potential negative environmental impacts [23]. The significance of including local communities in decision-making processes concerning economic transformation is emphasized by the results. Promoting the active involvement of communities in tourism and other economic activities can contribute to the achievement of inclusive and sustainable development. To ensure the success of transformation initiatives, it is essential to prioritize the needs and concerns of local residents and actively seek their input and support.

Although there have been efforts to promote sustainable mining practices, challenges still remain in effectively enforcing compliance and monitoring mining operations. It is crucial for the provincial government and relevant authorities to work together with the mining industry in order to implement more stringent environmental regulations and promote responsible mining practices. In addition, it is important to establish alternative sources of income for individuals working in the mining industry. This will help them transition away from relying solely on mining for their livelihoods. The province's ongoing infrastructure projects play a crucial role in supporting economic diversification and attracting tourists. It is crucial to prioritize sustainable infrastructure development to prevent the degradation of natural ecosystems. Furthermore, it is crucial to strike a balance between ensuring accessibility to remote areas and implementing conservation efforts to safeguard vulnerable habitats. To successfully transition to a tourism-oriented economy, it is crucial to implement comprehensive and sustainable tourism management strategies. This includes conducting assessments of carrying capacity, developing waste management plans, and implementing measures to safeguard cultural heritage and delicate ecosystems. It is important to promote community-based tourism models in order to ensure a fair distribution of economic benefits among local communities.

4 Conclusion

Both The analysis of the relationship between tin mining and tourism in Bangka Belitung Province has provided insights into the intricate interactions between these industries and their impacts on local communities and the environment. The study sought to explore the potential opportunities for development that arise from this transition, as well as the challenges and risks that need to be addressed. The region has experienced significant socio-economic effects as a result of tin mining. The sector has had a significant impact on local communities by creating jobs and generating income. It has also contributed to economic growth and supported the development of infrastructure. On the other hand, the advancement of technology has had a significant impact on society and culture, leading to changes in traditional practices and community interactions. The fluctuating nature of mining activities poses a significant risk to local economies, making them susceptible to external factors. Therefore, it becomes crucial for these economies to diversify in order to minimize the impact of economic uncertainties.

Tin mining has posed noteworthy challenges in the environmental sphere. The delicate ecosystems and biodiversity of Bangka Belitung Province are under threat due to
deforestation, water pollution, and habitat destruction. The effectiveness of enforcing existing environmental regulations is a concern, despite their presence. The adoption of sustainable mining practices and the enhancement of environmental conservation efforts are crucial measures to address and minimize the adverse effects of mining on the ecosystems in the region. The emergence of tourism as a potential alternative presents promising opportunities for the Bangka Belitung Province. The region is characterized by its distinct natural landscapes, which offer a variety of opportunities for exploration and appreciation. Additionally, the area is known for its vibrant cultural heritage, providing visitors with a chance to immerse themselves in authentic experiences. These appealing qualities have the potential to attract both domestic and international tourists. By strategically leveraging these resources, the province has the opportunity to broaden its economic base and decrease its reliance on the mining industry. In addition, it is important to note that sustainable tourism practices have the potential to make a positive impact on environmental conservation efforts. By implementing such practices, we can ensure the preservation of the natural beauty that serves as a major attraction for visitors to the area.

The relationship between tin mining and tourism in Bangka Belitung Province poses several challenges. The process of transitioning from extraction to attraction necessitates meticulous planning and collaboration among multiple stakeholders, such as local communities, government entities, private enterprises, and non-governmental organizations. The need to strike a balance between economic interests and environmental protection is crucial in order to guarantee the long-term sustainability of both industries. The study highlights the importance of adopting a comprehensive approach to sustainable development in the Bangka Belitung Province. It is crucial for policymakers to give priority to responsible mining practices and implement strict environmental regulations. Additionally, they should also focus on promoting investment in tourism infrastructure and enhancing capacity building. The collaboration between the mining and tourism sectors has the potential to generate innovative solutions that have positive impacts on the local economy, cultural heritage preservation, and environmental conservation.

The Bangka Belitung Province is currently facing a critical situation where it has the opportunity to capitalize on the potential of tourism, while also addressing the difficulties associated with tin mining. By comprehending the intricate relationship between the socio-economic and environmental factors within these industries, stakeholders can collaborate to achieve a future that is both resilient and sustainable. By prioritizing responsible mining practices, actively engaging with the local community, and promoting sustainable tourism, the Bangka Belitung Province can transition from being solely focused on extraction to becoming a vibrant and appealing destination for both residents and tourists.

We would like to express our gratitude to LPPM-UBB for providing financial assistance. In addition, we are profoundly grateful to the research participants, whose willingness to share their time and experiences made this study possible. Their contributions have enriched our discoveries and deepened our comprehension.

References

17. J. Jacobs, Modes of Governance and Revenue Flows in African Mining, (Kindle, 2013) pp. 16-47