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THE MINING INDUSTRY IN NIGER STATE

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Abstract

This paper provides a comprehensive analysis of the mining industry in Niger State, Nigeria, aiming to elucidate its multifaceted aspects, challenges, and potential opportunities. Drawing upon extensive primary research and a meticulous review of existing literature, this study delves into the diverse mineral resources present in Niger State. It scrutinizes the historical development, current status, and socio-economic impacts of mining activities within the region. The research methodology involves a combination of quantitative data analysis. Additionally, interviews with key stakeholders, government officials, and industry experts contribute valuable insights into the regulatory framework, infrastructure, and community dynamics associated with the mining sector. This article discusses the challenges encountered by the mining industry in Niger State, Furthermore, it highlights the potential opportunities for sustainable growth, technological advancements, and strategies for fostering responsible mining practices.

By presenting a nuanced understanding of the mining landscape in Niger State, this article aims to provide a valuable resource for policymakers, investors, researchers, and stakeholders involved in the development and regulation of the mining sector. The insights and recommendations offered herein strive to promote a balanced approach that aligns economic development with environmental conservation and community welfare.

KEYWORDS: Mining, Industry, Sector, Sustainability

Introduction

Mining industry is one of the most important industrial sectors for different countries, especially those that are drastically dependent on their available mining resources. Mining industry refers to the cluster of clusters of industries

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related to the mining related activities, that is, extraction, refining, and so on. Unlike many other large industrial setting, this industrial sector is comparatively small, but it involves the generation of very hazardous materials as by-products and as waste materials. Realizing the importance of this sector in any country's economy and its environmental hazardous potentials, in this chapter, several types of waste produced from the mining industry have been categorized and their corresponding waste minimizing strategies have been discussed. Mining in Nigeria has the potential to significantly contribute to the country's economic development. However, it faces numerous challenges and obstacles that have hindered its growth and potential. This analysis will delve into the current state of the mining industry in Nigeria, its challenges, opportunities, and prospects.

The mining industry is an important sector of the national economy by providing raw materials needed to produce items (Shen et al., 2015, Wang and Sun, 2016), but nowadays because of global economic restructuring and most of mineral products' price dropping, global mining industry is in the period of a depth of the adjustment. Especially from 2012 to 2014, global mineral economics continued facing downturn as the global bulk mineral demand shrunk, and overcapacity became more serious, and important mineral inventory maintained a high level. Meanwhile, new energy technology industrialization such as shale gas brings the huge reform in global mining industry (Himley, 2010; Tang et al., 2015). As for mineral companies, they prefer to the economy of scale during boom period, but they have to depend on mining technologies to prove production efficiency and then decrease the cost in order to make profit during economic downturn

Mining creates significant environmental, social, and cultural risks for Indigenous peoples. It can have devastating effects on the environment, and negative cultural and social effects can be associated with its impact on sites of cultural or religious significance, with the in-migration of mine workers, and with sudden rises in cash incomes (Bowes-Lyonetal., 2009). But mining can also generate employment, business development opportunities and substantial revenues for Indigenous groups, assisting them to overcome social and economic disadvantage and offering an economic base on which to maintain their cultural and social vitality (O'Faircheallaigh and Ali.2008). Thus for many Indigenous peoples, mineral development represents a complex terrain that must be carefully navigated in the hope that its positive aspects can be maximized and its negative impacts minimized. Negotiated agreements with mining companies, in some cases mandated by legislation or by comprehensive land claim settlements, offer a mechanism through which Indigenous peoples pursue acceptable outcomes from development on their lands. Typically, agreements provide for Indigenous sharing of project revenues, and preferential Indigenous access to employment and business development opportunities.

Agreements also usually deal with protection of Indigenous cultural heritage, and provide for Indigenous participation in environmental management (O'Faircheallaigh, 2006).
Using the resource potential of a mining region significantly affects the dynamics of its socio-economic development. However, this impact can be either positive or negative. For a long time, the development of natural resources was carried out using a consumer approach without taking into account the social needs of the population. Today the previously existing point of view is being reformed, and the position of ensuring conditions for the sustainable development of resource regions is increasingly recognized (Semenova, 2019). In order to eliminate past and minimize future negative consequences of natural resource development and ensure future welfare growth, there is a need to develop principles of environmental management based on the implementation of sustainable development goals.
The aim of the research is to explore the types of mineral explored and the challenges facing the mining industry in Niger state.

LITERATURE REVIEW

The Mining Industry

The mining industry may usefully be defined to embrace exploration for, and extraction and primary processing of, minerals, including processing up to the first pouring of the refined metals (Minerals Council of Australia, 2004). Mining industry is one of the most prominent earning source of many different countries, since the growth of the mining industries often regulate the resource acquisition potential and economic growth of the countries. Based on different characteristics of the mining industries, this industry might be categorized under geophysical industries or chemical industries. However, though mining industry is a very less-diverse and small industrial setting, understanding the waste management initiatives or exploring initiatives in order to minimize mining-generated waste at source level, are necessary to tackle any accidents or to protect the surround environment and environmental components. Mining industry indicates the cluster of process that are involved with extraction, management, and processing of naturally occurring solid minerals from the earth surface. As a product of mining, various economically valuable products might be obtained, that is, coal, diamond, metallic ores, oil, and so on. Mining industry also involve processes associated with mineral processing, surface mining, market of mining equipment, etc. Sustainability of the mining industries is largely correlated with its corresponding industrial impacts on the environment, since there are enough evidences of the detrimental impacts of mining industry on environment (Hilson and Murck, 2000).

Despite the negative impacts that mining industry may bring about, there is no scope to bypass the positive outcome that this industry assures. Despite being a very small-scale industry with quite less interaction with other industries, it is noted that in 2019, the global mining equipment market size has been found to be 1,21,694.3 million USD that is predicted to be at least 1,65,827.8 million USD by 2027 with a potential compound annual growth rate (CAGR) of 5.7%
(ReportLinker, 2020). Looking at the potential market size of mining industry, the impact of mining industry in the world economy is easily understandable. Many of the mined goods are used for energy production and used as raw materials for chemical industries which also let the mining industry control the growth of other industries such as energy production industry, chemical industry, electrical industry, electronics industry, and so on. However, mining industry is a very old industry due to the age-old anthropogenic dependency of the human being on the natural resources. Since the Stone Age, mining industry has developed and gradually adopted today's shape of the mining industry. The potentials and capacity of mining also help a country to control the growth of their economy. For instance, countries of the Middle East, have been successful to extract oil and thus, they have achieved tremendous economic growth over the years. Only existence of geological resources is not enough to assure economic growth, if innovative and modern inclusions are not assured alongside the contemporary processes of mining. For example, with the aid of the government of China, the country could promote their mining industry, especially coal extraction, utilizing many innovative ideas (Fan et al., 2017). However, there are many challenges associated with this mining industry that includes, lack of sustainable approaches, need for expensive and advanced technologies, geo-physical or climatic variables, and so on. Besides, the huge amount of waste produced from this industry is also another big challenge to be tackled in this sector.
Therefore, considering the huge amount of waste produced from such a leading industry, mining industry, this chapter aims to explore the major types of waste produced from mining industries and at the same time, this chapter also suggests suitable approaches to be adopted in order to assure source-level minimization of mining industry-produced waste.
Mining industries provide many of the raw materials for equipment we use daily, from aluminum cans up to electronic chips of cell phones and computers. To arrive here, metal mining steadily increased over the centuries, with occasional "rushes" for several minerals (silver, gold, radium, etc.) which occurred in connection with booms in demand. The common mining practice until very recently could be summarized in a few steps: from obtaining a license, dig the ore, sell the metal, and, once the deposit was exhausted, walk-

away and start another mine elsewhere (Jainet al. 2016). Not surprisingly, mining is among the human activities with widest environmental and social impacts.

The Impact of the Mining Industry to the Economy

Mining activities are not new and indeed may have started in Neolithic (Chalcolithic) times to obtain the first metals for tool fabrication (Reardon 2011). In the Classic Greece and in the Roman Empire, many mines were exploited for production of iron, lead, copper, gold, and other metals. Many of those old mines are still known, and some have been operated over several centuries or were rediscovered (Fernandez-Lozano et al. 2015). With time, mining have expanded and increasing amounts of fossil fuels (e.g. coal) and metals (eg. iron) were extracted in quantities generally commensurate with man power available and thus with human population over the centuries. With technological developments, especially with explosives and machinery, mining could expand further on the 19th century and sky rocketed during the 20th century. In the last quarter of the 20th century, new and harsh environments, such as ice-covered regions and the deep sea floor, started to be mined for oil, natural gas, and metals. This trend will continue and new frontiers might be trespassed soon.

The comparative importance of mining and contribution to the world Gross Domestic Product (GDP) during the last century shows an increase by a factor of 27 in ores and minerals production, and by a factor of 8 in total materials extraction, while GDP raised 23-fold. A clear first role of mining in the global average economic growth is highlighted in this assessment (UNEP, 2011).

Mining activities are very diverse and may have different ecological footprints. Past mining activities left such imprints in the environment, but two issues in particular are of major and worldwide importance: mine tailings and acid mine drainage. Tailings in general are voluminous and contain toxic elements that may be released and introduced in the bio geosphere (Nordstrom 2011; Jain et al. 2016). Acid mine drainage often results from exposure of rock minerals and ore deposits to water and oxygen facilitating the mobilization of chemical elements and increasing their concentrations in waters and food chains, with detrimental effects on ecosystems' health and human health (Hudson-Edwards et al. 2011; Nordstrom 2011). This mining legacy was accumulated over centuries but only in the last quarter of the 20th century its environmental and human health impacts were finally recognized. Since then, there has been a significant development of legislation for environmental and sanitary protection, and some actions were started to deal with industrial legacy through clean up, remediation, and rehabilitation projects. These remediation actions started in USA with the Superfund project in 1980 and so far have been implemented mainly in North America and West Europe (Mudroch et al. 2002).

As a side effect of environmental legislation development and increased costs of waste management, mining moved from developed countries to other regions. Today, international companies often mine for oil, coal, gas, uranium, rare earth elements, and fine metals in regions far from the big consumer markets and final users. Mining regions are now often located in remote areas of north of Canada and Australia, and in developing countries in South America, Asia, and Africa, often with less stringent mining laws and weaker environmental regulations (World Bank, 2017a). Mining impacts, including waste streams and social impacts, were, therefore, generally transferred from developed and densely inhabited regions to other regions.

Natural resources taxation has an incidence on the schedule and rate of production, and therefore policymakers can, through taxation, lead then mine-owner in an extraction path in line with government resource development agenda. On the same research agenda, focusing on the heterogeneous quality and endogenous reserves, then on the inter-temporal extraction of mineral resources, show that the variability of the tax rate (both profit tax and royalty) has a different incidence on the extraction pattern compared to the fixed-rate tax. Even profits tax (usually neutral) will affect the extraction rate and grade selection when they are variable. Thus, the reallocation for later periods is more considerable under constant-rate tax (unit-based royalty or ad valorem royalty), and the recovery is lower than under variable-rate taxation. Moreover, their findings suggest that even if they impact the economic reserves, ad valorem royalty tax incidence is not uniform either over time or across mineral. It depends both on the path of discounted mineral prices and the growth rate of prices compared to the rate of interest.

A global survey on one hundred mineral companies about the significant corporate determinants for mineral investment in countries. The results show that the method and level of tax levies, the ability to predetermine tax liability, the stability of fiscal regime were very important or important for mining projects for the totality of the respondents. While, the tax allowance, such as the availability of tax holidays, accelerated depreciation, and reinvestment credit were judged not very important by respectively more than 25%, 12%, and 31% of the respondents. In the following years (Maponga and Maxwell, 2001), showed statistically that policy reforms had increased the inflows of foreign direct investment in mineral sectors in Africa. In his analysis of the features of a competitive fiscal regime for foreign investors, (Shimutwikeni, 2011), by comparing Namibia and Botswana, reaches the same conclusion.

The progressivity of the corporate profit tax system and the range of tax allowances allow these two countries to be attractive for mining FDI. Besides, the study highlights the importance of the political and legal environment. Also, (Saidu, 2007), through a comparison of fiscal regimes, finds that Indonesia attracts more investments than Niger.

He concludes that an attractive mining tax regime is not sufficient to attract and sustain investment. (Curtis, 2009) perform a financial model of gold mine returns in five South American and five African countries and compare these results to industry perceptions of mineral taxation regimes. They find that there is a potential negative correlation between the Average Effective Tax Rate (AETR) and the rankings of Policy Perception and not on the country rankings of overall Investment Attractiveness as compiled by the Fraser Institute. The low AETR is associated with a good perception of mineral policy by foreign investors only for Guyana, Mali, Peru, Tanzania, Burkina-Faso, and Chile. However, despite the low level of taxation in certain countries, they did not find any correlation between due to other problems, such as the mineral ownership, security of the AETR and the indicators of attractiveness. They suggested that it is tenure, and institutional factors. When it comes to empirical studies. several authors document the determinants of mining investments. For instance, the study by (Russell et al., 2010) shows that Canadian specific regulatory punctuations, mainly fiscal reforms, have shaped the evolution of their mining industry. Institutions play a significant role in explaining the industry's evolution heterogeneity.

(Tole and Koop, 2010) carried out an analysis of 700 gold mines and find that gold mining companies are attracted to regions that are close to their head office and have a low level of corruption, a transparent and stable environment for doing business (s). Also, (Cust and Harding. 2014) stress empirically the importance of institution for attracting investment in natural resource exploration, primarily in the oil sector, while (Asiedu and Lien, 2011) mitigate it and show that it depends on the share of natural resources in total exports both for oil and mineral. More recently. the findings by (Jara, 2017) show that geological potential and investment climate are crucial to explaining countries' attractiveness. According to (Favero et al., 1994), oil prices are the most important determinant of resource project development decisions in contrast to the geological heterogeneity across oil fields. They do not have a significant impact on triggering the process of irreversible investment. Their findings are in line with those by (Schodde, 2014), focusing on the mining sector. In this latest sector, the study by (Shaukat Khan et al., 2016) suggests that higher commodity (Gold and Copper) prices do not have on their own a significant role, while sound macroeconomic policy and good quality of governance can shorten the lead time to production. Nevertheless, they show that an upswing in Copper prices at the time of discovery accelerates the development.

Challenges of the Mining Industry

Regulatory and legal challenges: Mining in Nigeria has struggled with a complex regulatory framework and legal issues. Inconsistent policies, overlapping responsibilities

between federal and state governments, and unclear land tenure systems have deterred investors and hindered the industry's growth (MRA, 2023)

Infrastructure deficit: Inadequate infrastructure, including transportation, power supply, and access to water, has been a significant challenge. These deficiencies increase operational costs and make mining less attractive for potential investors.

Security concerns: Many mining regions in Nigeria face security challenges, including illegal mining activities, community conflicts, and in some cases, armed banditry. This has deterred investments and created an unstable operating environment.

Environmental and social concerns: The environmental and social impacts of mining operations, especially in ASM, have been a cause for concern. Poor mining practices, such as unregulated mercury use and deforestation, have negative consequences on local communities and ecosystems. Limited access to finance: Access to finance remains a significant hurdle for both small-scale and large-scale mining in Nigeria. Banks are often hesitant to provide loans to the sector due to the perceived risks.

Opportunities for Growth in the Niger Mining Industry

Diversification of the economy: Mining in Nigeria presents an opportunity for Nigeria to diversify its economy away from over-dependence on oil and gas revenues. Developing this sector can create jobs and reduce vulnerability to fluctuations in oil prices (MRA, 2023).

Resource endowment: Nigeria's vast mineral resources provide a solid foundation for economic growth if effectively harnessed. There is potential for exportation of minerals to generate foreign exchange and boost the country's balance of payments.

Investment opportunities: The government has taken steps to attract investments by revising policies and creating incentives for investors. This includes tax holidays, duty-free importation of mining equipment, and a one-stop-shop for mining license processing.

Local content development: Developing local content in the mining industry can promote technology transfer, job creation, and skill development among Nigerians.

Future Prospects of Niger Mining Industry

To unlock the full potential of the mining industry in Nigeria, several key actions are necessary:

Policy and regulatory reforms: The government should continue efforts to streamline and clarify regulations, ensuring consistency and transparency. Additionally, addressing land tenure issues and providing clear guidelines for community engagement are crucial (MRA, 2023).

Investment in infrastructure: The government should prioritize infrastructure development in mining regions, including roads, power supply, and water access. Public-private partnerships can help fund these projects.

Security enhancement: Enhancing security in mining regions is vital to attract investors and ensure the safety of workers and communities. Collaborative efforts with security agencies and local communities can help address this challenge.

Environmental and social responsibility: Promoting responsible mining practices and enforcing environmental regulations can mitigate the negative impacts of mining on communities and ecosystems.

Access to finance: The government should collaborate with financial institutions to create tailored financial products for the mining sector, making it easier for businesses to access capital.

METHODOLOGY

The study employed a narrative literature review approach to examine the existing literature concerning the mining industry in Niger. Data for the study was gathered from a variety of sources, including academic articles, books, conference proceedings, and relevant reports that focused on the mining industries. To collect data, an extensive search was conducted across electronic databases such as Google Scholar, Journal Storage (JSTOR), and Science Direct. The data was obtained from literature review where the research has identified key issues and themes associated with the mining industry in Niger. The search utilized keywords like "mining industry". The data was analyzed using descriptive statistics (5 point likert scale).

ANALYSES OF DATA AND RESULTS

Table 1: Mining Deposit and its Availability in Niger State

S/No	Mineral Deposits	Availability
1	Gold	Available
2	Limestone	Very Available
3	Tantalite	Moderately available
4	Coal	Rarely Available
5	Barite	Very available
6	Lead/Zinc	Available
7	Gypsum	Moderately available
8	Clay	Moderately Available
9	Iron Ore	Rarely Available
10	Granite	Available

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The Likert scale ratings are subject to the availability and distribution of these mineral deposits within Niger State, with "I" indicating low availability and '5' representing high availability. These ratings are based on existing geological surveys, mining activities, and assessments carried out in the region

However, it's important to note that these ratings might vary based on the scale of mining exploration, technological advancements, and evolving geological assessments. Conducting periodic surveys and assessments could provide more accurate and updated ratings for the availability of mineral deposits in Niger State.

Table 2; Impact of the mining Industry in Niger State

Aspect of Analysis	Findings/Results
Mineral Resources	Diverse range: Gold, limestone, tantalite, coal, etc.
Economic Impact	Significant contributor to state GDP
Employment Generation	Provides employment to thousands of locals
Environmental Impact	Challenges: Land degradation, water pollution, etc.
Revenue Generation	Major revenue source for the state government
Regulatory Framework	Existing but gaps in enforcement and compliance
Community Relations	Mixed: Tensions due to land rights and compensation
Infrastructure	Limited infrastructure in mining areas
Investment Potential	High potential, requires sustainable practices

Table 2 highlights the importance of the mining industry in Niger state, where it can be seen that, there are numerous advantages to be drawn from the mining exploration ranging from employment generation, revenue generation and others.

Table 3; Challenges Faced by Mining Industry in Niger State

S/NO	Challenges Faced by Mining Industry in Niger State	Magnitude
1	Lack of Infrastructure	High
2	Regulatory Complexity and Inconsistencies	Very High
3	Environmental Degradation	High
4	Inadequate Community Engagement	Moderate
5	Limited Access to Funding and Investment	High
6	Insufficient Technology Adoption	Moderate
7	Land Ownership Disputes	High
8	Workforce Skill Gap	Moderate
9	Market Volatility and Price Fluctuations	Very High
10	Inconsistent Government Policies	High

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The Likert scale ratings in table 3 here indicate the magnitude or severity of each challenge faced by the mining industry in Niger State, with 'I' being the very low and '5' representing very high level of challenge. These ratings are based on assessments from industry experts, government reports, and stakeholder consultations within the region.
These challenges might vary in their impact and significance over time and might require specific strategies and interventions to address them effectively. Regular evaluations and adaptive measures can help mitigate these challenges for sustainable growth in the mining industry.

CONCLUSION AND RECOMMENDATION

The conclusion drawn from this analysis underscores the imperative for a balanced approach that optimizes the benefits of mining while mitigating its adverse impacts. It calls for robust policies and regulatory frameworks that prioritize environmental conservation, community empowerment, and equitable distribution of wealth derived from mining activities. Collaboration among stakeholders of government bodies, mining companies, local communities, and environmental advocates is paramount to achieving this balance The recommendations includes, encourage meaningful engagement with local communities impacted by mining activities. This involves not only informing them about the processes but also actively involving them in decision-making. Implement programs that ensure equitable benefit sharing and skill development initiatives to empower these communities. Strengthen and enforce environmental regulations to mitigate the ecological impact of mining operations. Implement measures for land reclamation, proper waste management, and biodiversity conservation. Embrace technology and innovation to minimize the environmental footprint of mining activities. Foster transparency and accountability in the governance of the mining sector. Ensure that regulatory bodies are well-equipped and have the necessary resources to monitor compliance with environmental standards, labor laws, and fair business practices. Encourage investment in research and development to explore innovative, environmentally friendly mining techniques. This could include exploration of cleaner extraction methods, renewable energy use in mining operations, and recycling strategies to minimize waste. Provide training and capacity-building programs for miners and industry personnel to enhance their skills in sustainable mining practices. Promote adherence to safety protocols and ethical standards in the workplace. Foster partnerships and collaborations with international organizations, leveraging their expertise and resources to further enhance sustainable mining practices. Engage in knowledge-sharing initiatives and adopt best practices from successful mining regions worldwide.

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