

Management of the Moroccan Mining Heritage: Regulations and Development Strategies

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Abstract

The special events that have marked Morocco's geological history have positioned the country as a prominent mining country, particularly in phosphates. Although Morocco holds the world's largest reserves of phosphates and ranks well in the production of other minerals like silver, barite, and cobalt, the non-phosphate mining sector faces significant performance deficiencies. This paper provides a comprehensive overview of the current state of the Moroccan mining sector, while shedding light on the challenges related to legislation, scientific infrastructure, investment, workforce, social acceptance, and other crucial factors that hinder its progress. Additionally, the paper offers insights into the various strategies adopted by the government to overcome these obstacles and unleash the potential of the promising sector.

Keywords: Mining Heritage Management, Regulation reform, Development Strategies

1. Introduction

Morocco, a North African nation boasting a geological history spanning over three billion years, finds itself at the crossroads of rich mineral wealth and a profound mining heritage. This geological richness, coupled with favorable outcrop conditions, has endowed the nation with an abundance of mining resources that have been harnessed since antiquity (Piqué et al., 2007). As the mining sector holds a pivotal position in Morocco's economy, it becomes imperative to understand the nuanced facets of Morocco's mining heritage, ranging from its historical roots to contemporary challenges and future strategies. While Morocco stands as the world's leading exporter and the third-largest producer of phosphates, a vital component of fertilizers, its mineral wealth extends well beyond this singular resource (MEME, 2021). The mining sector's contribution to the national economy is substantial, with a contribution of 10% to GDP in the year of 2021 and 19.2% to national exports (MEME, 2021). Nonetheless, a stark contrast emerges when we turn our attention to the non-phosphate mining industry, which grapples with underinvestment and multifaceted challenges. The turnover and production figures for the non-phosphate mining industry in 2020 lag significantly behind the phosphate industry (MEME, 2021).

By examining the historical narrative, the roots of mining activities in Morocco are traced back to the early 12th century with iron extraction mines such as Jbel Aouam in the Massif Central (Piqué et al., 2007). Through the annals of time, Moroccan and foreign researchers have made significant contributions, resulting in extensive geological mapping and the identification of distinct metallogenic provinces (Piqué et al., 2007). These geological foundations have positioned Morocco as a mining

powerhouse, particularly in the domain of phosphates. However, the narrative takes a nuanced turn when we confront the modern challenges faced by the Moroccan mining sector.

This paper endeavors to contribute to this discourse by shedding light on the management of Moroccan mining heritage, particularly focusing on regulations and development strategies. The aim of this study is to provide a comprehensive overview of the current state of the Moroccan mining sector, emphasizing the challenges related to legislation, scientific infrastructure, investment, workforce, and social acceptance. By doing so, we seek to not only uncover the hurdles impeding the sector's progress but also explore the strategies adopted by the Moroccan government to overcome these obstacles and unleash the sector's untapped potential.

A comprehensive exploration of mining heritage necessitates an engagement with the broader international literature on mining and its historical legacies. Prior research in this field has offered valuable insights into the complexities of managing mining heritage, addressing issues ranging from land use conflicts to environmental concerns. The field of mining heritage management is multifaceted, encompassing a wide array of challenges and opportunities that resonate both locally and globally. (Engels & Dietz, 2017) delve deep into the intricate interactions between extractive industries, society, and governance, illuminating the struggles that often define resource extraction. Their work underscores how mining activities can become focal points for social and environmental contestations. Similarly, (Arias-Loyola, 2020) extends our understanding of mining practices beyond terrestrial boundaries, highlighting the interconnectedness of mining operations across borders and emphasizing the significance of international perspectives in mining heritage management. These international perspectives align with our focus on the Moroccan context, prompting us to contemplate the broader implications of mining activities on a planetary scale. (Rîșteiu et al., 2022), through their investigation into the Rosia Montana mining case, provide a valuable case study mirroring the challenges faced by mining projects in diverse regions. Their research unveils the intricacies of land use conflicts, environmental concerns, and the social dimensions of mining activities, underscoring the universal relevance of these issues in the context of mining heritage management. (Vesalon & Remus, 2013) shift our attention to the importance of diversifying mining activities beyond a single resource, echoing our discussion on the need for Morocco to explore opportunities beyond phosphate mining. Their work serves as a reminder of potential regional disparities arising from a singular focus on one type of mining. (Tukker et al., 2018) emphasize the environmental impact of mining activities and its implications for resource management, advocating for sustainable mining practices. (Hilson, 2002) examines the socio-economic impact of small-scale mining in developing countries, contributing insights into the challenges and opportunities associated with artisanal mining, a significant aspect of mining heritage. Finally, (Hall & Saarinen, 2010) present a global synthesis of mining heritage and tourism, showcasing the potential of mining heritage as a tourism resource and highlighting the importance of sustainable tourism in preserving mining heritage. Collectively, these studies offer a comprehensive understanding of the complexities, challenges, and opportunities inherent in mining heritage management, providing a foundation for our analysis of Moroccan mining heritage practices.

Our research approach is informed by the analysis of data gathered from a comprehensive range of policy documents related to mining regulations, development plans, and reports issued by governmental and non-governmental organizations. These documents shed light on the regulatory framework, development strategies, and challenges facing the Moroccan mining sector. Our analysis involves a

discursive examination of the collected data through a qualitative approach. This interpretative method allowed us to uncover underlying trends, regulatory shifts, and challenges within the mining sector.

2. Mining Legislation and Regulation Reform

The regulatory framework governing mining activities plays a pivotal role in shaping the mining landscape of any nation. In Morocco, the journey of mining legislation and regulation reform has been marked by significant milestones that have reshaped the sector's dynamics. This section delves into the evolution of mining laws in Morocco, highlighting the transformative shift brought about by the 33-13 mining law enacted in 2015.

2.1 Historical Perspective: The 1951 Dahir

The history of Moroccan mining regulations can be traced back to the 1951 Dahir, which governed the mining sector for over six decades. This historical context is essential to understanding the regulatory challenges and deficiencies that Morocco has addressed in recent years. The 1951 Dahir, dating back to the protectorate period, had several shortcomings in its articles. These included allowing individuals to benefit from Research and Operating Permits, enabling research for relatively small areas, retaining exclusivity of information, and limited coverage of research and mining to specific minerals (El Atillah et al., 2018). Moreover, it lacked provisions for the protection of natural resources and the environment, raising questions about sustainability.

2.2 The 33-13 Mining Law: A Paradigm Shift

In 2015, Morocco embarked on a path of reform with the enactment of the 33-13 mining law, marking a new era in the regulation of the mining sector. This transformative piece of legislation introduced more realistic and ambitious codes, aiming to modernize the mining sector and attract investments for the development of Morocco's mineral wealth. Unlike its predecessor, the 33-13 law regulated all mineral substances except phosphates, set longer durations for mining permits, and allowed for exploration, research, and exploitation activities. The 33-13 law established three types of mining permits (MEMWE, 2015):

- **Exploration Authorization:** Valid for two years, renewable once for one year, it grants exclusive rights to explore the area and obtain one or more Research Permits.
- **Research Permit:** Covers a square perimeter of 16 km² with a validity of three years, renewable once for four years.
- **Operating Mining License:** Provides the holder with the exclusive right to explore, prospect, and exploit mineral substances within the designated perimeter.

The 33-13 law introduced several environmental protection measures, reflecting a growing awareness of the environmental impact of mining activities. Mining companies are now required to carry out environmental impact assessments before commencing any mining operations, ensuring that potential environmental risks and impacts are carefully evaluated and mitigated. This step promotes sustainable mining practices, aligning with global trends in responsible resource extraction. Additionally, mining companies are obligated to rehabilitate affected areas once mining activities have ceased, minimizing the long-term environmental footprint of mining operations.

While the 33-13 law significantly improved the regulation of mining heritage in Morocco, challenges remain. One primary challenge is the lack of coordination and integration between various stakeholders involved in mining heritage management. This includes government administrations responsible for

mining permits, environmental protection, and cultural heritage preservation. Without proper coordination, there is a risk of conflicts of interest and mismanagement of mining heritage sites. This section highlights the transformative journey of mining legislation and regulation reform in Morocco, emphasizing the shift from the 1951 Dahir to the 33-13 law. It also underscores the importance of environmental protection measures and the need for improved coordination in mining heritage management.

2.3 Artisanal Mining: A Vital Component of Morocco's Mining Landscape

While large-scale mining operations often take center stage in discussions about Morocco's mining sector, it's crucial not to overlook the significant role played by artisanal mining. Artisanal mining activities, governed by the Dahir of 1/12/1960, constitute a vital component of Morocco's mining landscape, contributing to both the local economy and the broader mining heritage of the country.

Artisanal mining in Morocco has deep historical roots, with communities engaging in small-scale mining activities for generations. These activities have traditionally focused on minerals such as lead, zinc, and barite, reflecting the diverse geological richness of Morocco. The artisanal mining sector has been integral to the livelihoods of many communities, particularly in regions like Tafilalet and Figuig.

The Dahir of 1/12/1960 established the framework for regulating artisanal mining in Morocco. Under this legislation, the « Comité de Suivi et de Coordination des Activités d'Exploitation des Terres Aurifères et Minérales(CADETAF) » was established. CADETAF plays a crucial role in overseeing artisanal mining activities, ensuring compliance with regulations, and facilitating the marketing of extracted minerals, including lead, zinc, and barite(MEMWE, 2016). Artisanal mining, while providing economic opportunities to local communities, also faces its share of challenges. These include issues related to safety, environmental impact, and the informal nature of many operations. Addressing these challenges while preserving the socio-economic benefits of artisanal mining is a delicate balance.

Recognizing the historical significance and cultural importance of artisanal mining, is an opportunity for collaboration and knowledge sharing between artisanal miners and large-scale mining companies. This synergy can facilitate responsible resource extraction while safeguarding the livelihoods and heritage of artisanal mining communities. In conclusion, artisanal mining remains a vital and enduring component of Morocco's mining sector. As Morocco continues to navigate the complexities of its mining sector, artisanal mining deserves recognition and consideration for its role in shaping both the local economy and the broader narrative of mining heritage.

2.4 The Need for Reform: Advancing Morocco's Mining Sector

To ensure the sector's sustainability and continued growth, there is an imperative need for comprehensive reforms that address various aspects, from legislative frameworks to sustainable practices. This section explores the compelling case for reform and the areas where Morocco's mining sector can evolve and thrive.

- **Integration of Laws: A Coherent Legal Framework**

One of the primary challenges facing Morocco's mining sector is the lack of integration between the 33-13 mining law and other relevant laws related to the environment, land use, and water resources. The mining sector's activities can have profound impacts on the environment and local communities. As such, a coherent legal framework is essential to address these interconnected issues effectively. The reform should seek to harmonize mining laws with broader environmental and land use legislation. This

integration will ensure that mining activities consider their broader impacts, emphasizing responsible resource management and environmental preservation.

- **Community Engagement: Ensuring Local Participation**

Another vital aspect of reform involves enhancing the participation of local communities in the decision-making processes related to mining activities. These activities can significantly impact the livelihoods and environments of nearby communities. Meaningful consultation and consent from local communities are paramount for promoting sustainable and socially responsible mining practices. The reform should emphasize mechanisms for transparent and inclusive community engagement. It should empower local communities to voice their concerns, expectations, and aspirations related to mining activities, fostering a sense of ownership and shared responsibility.

- **Transparency and Governance: Building Trust**

Enhancing transparency and governance in the mining sector is essential to build trust with investors, local communities, and the public. This includes ensuring that mining contracts and agreements are made publicly available, promoting ethical business practices, and holding mining companies accountable for their actions. Reforms should prioritize transparency mechanisms that provide stakeholders with access to information about mining activities, contracts, and environmental impact assessments. This transparency will instill confidence in the sector and foster responsible behavior.

- **Capacity Building: Strengthening Expertise**

Strengthening the technical and administrative capacity of government administrations responsible for mining regulation is crucial for effective implementation and enforcement of mining laws. A knowledgeable and skilled workforce is essential for managing the sector efficiently. Reforms should include capacity-building programs, training initiatives, and knowledge sharing to enhance the expertise of regulatory bodies. Collaboration with international partners can also facilitate knowledge transfer and best practices.

- **Diversification of Mining Activities: Beyond Phosphates**

Morocco possesses diverse mineral resources, including precious metals, base metals, industrial minerals, and energy minerals. To reduce dependence on phosphate exports and capitalize on growing global demand for various minerals, diversification of mining activities is necessary. Reforms should encourage exploration and development of a broader range of minerals, leveraging the geological richness of different regions. This diversification not only enhances economic resilience but also distributes benefits more evenly across the country. International studies, such as Engels and Dietz's work on "Contested Extractivism" (Palgrave Macmillan), highlight the global relevance of diversified mining activities in promoting sustainable development.

- **Investment and Infrastructure Development: Enabling Growth**

Attracting investments and developing necessary infrastructure are vital for the growth of the mining sector. Creating a conducive investment climate by streamlining administrative procedures, ensuring legal stability, and offering competitive incentives is paramount. Additionally, infrastructure development, including transportation, energy, and water supply, is essential for the successful operation of mining projects. Investment in infrastructure projects that improve connectivity to mining sites and export facilities can enhance the sector's efficiency and competitiveness. Vesalon et al.'s study on the limits of mono-industrialism in mining management underscores the importance of infrastructure for mining success.

- **Sustainable Mining Tourism: Preserving Heritage**

Mining heritage sites can offer significant tourism potential. By promoting sustainable mining tourism, Morocco can capitalize on its rich mining history to attract visitors interested in cultural and historical experiences. Reforms should involve the development of visitor centers, guided tours, and educational programs that highlight the significance of mining heritage. Sustainable mining tourism can contribute to local economic development by creating job opportunities in the tourism sector.

In conclusion, the need for reform in Morocco's mining sector is not only a necessity but an opportunity for growth, sustainability, and responsible resource management. Addressing these challenges and implementing these reforms will unlock the sector's full potential while ensuring its positive contribution to Morocco's economic progress and sustainable development.

3. Development Strategies: Charting Morocco's Mining Future

With the foundation laid in the previous sections for reform and transformation, Morocco's mining sector can now embark on a path of strategic development. This section outlines key development strategies that force the country's geological wealth and promote responsible mining practices, economic growth, and sustainable development.

3.1 Morocco Mining Plan (MMP): A Roadmap for Growth

Launched in June 2021 by the Ministry of Energy Transition and Sustainable Development, the Moroccan Mining Plan (MMP) stands as a visionary roadmap designed to build upon the achievements of previous development strategies. The MMP's objectives are ambitious, aimed at addressing key challenges and fostering collaboration, transparency, and sustainable practices within the sector (MEME, 2021). The MMP sets forth several strategic objectives that promise to reshape Morocco's mining landscape, first is tripling turnover to over 15 MMAD (Moroccan Dirhams), reflecting an ambitious push for economic growth and revenue generation. Second, is Increasing investment in exploration and mining research tenfold to nearly 4 MMAD, fostering innovation and exploration efforts. Third is job creation by doubling the number of direct employments generated by the sector to more than 30,000 jobs highlighting the plan's commitment to job creation and economic integration. The MMP's participatory approach, engaging a diverse range of stakeholders such as industry experts, researchers, local communities, and investors, fosters a collaborative environment that ensures a comprehensive vision for the sector's future (MEME, 2021).

3.2 National Program of Geology (NPG): Enhancing Geoscience Infrastructure

Launched in February 2021, the National Program of Geology (NPG) represents a pivotal component of the broader Morocco Mining Plan. The NPG's primary focus is on enhancing Morocco's geoscience infrastructure and promoting the digital transition in the mining sector (DG, 2021).

- **Geoscience Mapping Program**

Building on the achievements of the previous National Geoscience Mapping Program (NGMP) 2017-2021, the NPG proposes a tri-thematic mapping work, encompassing geological, geophysical, and geochemical mapping across various regions. These include promising areas such as Tafilalet, Figuig, the Eastern Meseta, the Central Moroccan Massif, the Mauritanian zone, and the Laayoune-Dakhla basin. Furthermore, the NPG will expand coverage to include five additional priority areas, ensuring that the national coverage rate of tri-thematic geoscience maps reaches 22.89% by 2030 (DG, 2021).

- **Digital Infrastructure Development**

A significant aspect of the NPG is its focus on developing a digital infrastructure, facilitating the dissemination, sharing, and exchange of geoscientific information. The National Geoscience Information System serves as a centralized platform, providing access to geo-thematic maps at different scales. By harnessing geoscientific data and leveraging technology, the NPG aims to optimize exploration efforts and support informed decision-making processes (DG, 2021).

- **Geoscience Applications for Sustainability**

The NPG emphasizes implementing geoscience applications to address a wide range of issues related to the subsoil, resources, associated risks, urbanization, and information systems. This holistic approach integrates scientific, environmental, economic, and social considerations, ensuring that geoscience data serves as a foundation for sustainable mining practices and informed policy decisions (DG, 2021).

3.3 The Confluence of MMP and NPG: Synergies for Success

The convergence of the Morocco Mining Plan (MMP) and the National Program of Geology (NPG) forms a formidable synergy, reflecting a strategic and comprehensive approach to the country's mining sector. Recognizing that geology underpins mining activities, the alignment of these two initiatives marks a pivotal step towards unlocking Morocco's mining potential. The MMP's emphasis on sustainable development, economic integration, and environmental responsibility finds strong support in the NPG's dedication to enhancing mining attractiveness and geoscience infrastructure. The participatory nature of the MMP ensures that the NPG's mapping programs, and digital infrastructure development cater to industry needs, promoting a diversity of perspectives and generating a sense of ownership among stakeholders. The ambitious objectives set forth by the MMP and NPG offer a vision of an industry that embraces transparency, innovation, and social responsibility. In conclusion, the development strategies outlined in the Moroccan Mining Plan (MMP) and the National Program of Geology (NPG) represent a clear path forward for Morocco's mining sector. These strategies are not only visionary but also practical, laying the groundwork for a mining industry that thrives economically while upholding responsible practices and preserving the nation's geological heritage.

4. Conclusion:

Connections are drawn between our findings on the management of Moroccan mining heritage and the international literature on mining heritage management. By contextualizing our results within the broader discourse, we aim to provide a comprehensive perspective on the challenges and opportunities facing the Moroccan mining sector.

Alignment with Global Mining Heritage Trends:

We find that Morocco's experience in managing mining heritage shares commonalities with international practices. For instance, the challenges of reconciling mining activities with heritage preservation resonate with the global struggle to balance resource extraction and cultural heritage conservation. This duality underscores the need for proactive strategies to mitigate the impact of mining operations on historical and cultural assets.

Sustainability and Responsibility in Mining:

Our study also highlights the growing importance of responsible mining practices, a trend observed worldwide. The imperative to minimize environmental impacts, protect local communities' rights, and ensure worker safety underlines the global shift towards sustainable and socially responsible mining.

Local Community Engagement:

In line with international discussions, our findings highlight the significance of meaningful local community engagement in mining decision-making processes. Ensuring that communities affected by mining operations have a voice in the planning and execution of mining projects is a shared goal across various regions.

In conclusion, our study provides valuable insights into the management of Moroccan mining heritage, with a focus on regulations and development strategies. By addressing the challenges related to legislation, scientific infrastructure, investment, workforce, and social acceptance, Morocco's mining sector can position itself for sustainable growth.

We emphasize the importance of aligning Moroccan mining practices with global trends in responsible and sustainable mining. Diversifying mining activities beyond phosphates and enhancing local community engagement are essential steps toward fostering a more balanced and inclusive mining sector.

As we look to the future, we encourage further research that delves deeper into the dynamics of mining heritage management in Morocco and its implications for the broader international context. Exploring innovative approaches to harmonize mining with heritage preservation will contribute to Morocco's sustainable development and serve as a valuable reference for mining industries worldwide.

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