

The impact of mining on the environment in Morocco

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Summary. The mining sector is one of the pillars of economic growth, although it still has a negative impact on the environment. Mines have a significant impact on the environment in Morocco, both ecologically and socially. Mining as a source of income and economic development also has crucial consequences. In environmental terms. The opening of mines often leads to the destruction of local ecosystems. From this, deforestation, biodiversity loss and habitat fragmentation are frequent consequences of mining. In addition, mineral extraction can result in air, water and soil pollution due to the use of toxic chemicals and the release of fine particles. This has disastrous effects on water quality, the health of local populations and aquatic ecosystems. Mines also have significant social impacts. Local communities may be displaced from their ancestral lands, losing their livelihoods and their connection to their natural environment. Mine workers may be exposed to hazardous working conditions and high health risks. The Moroccan government has taken measures to mitigate the environmental impacts of mines, such as adopting stricter environmental regulations and promoting more sustainable mining practices.

Keywords: Environment, environmental protection, mining sector, mining impact, sustainable development.

1. Introduction

The Moroccan territory, characterized by a varied geology and particularly renowned for its wealth of mineral substances, has known, for several decades, a mining activity in the various regions of the Kingdom. Thus, the mining sector is still considered among the pillars of the national economy (Official site of the Ministry of Mines). The importance of this sector goes beyond the investments it drains through its contribution to gross domestic

product, its share in national exports and its beneficial effects on regional development in terms of infrastructure development of all kinds, wealth creation and jobs.

It is in this context that the Moroccan legislator carried out a reform of Law 33-13 on mines promulgated by Dahir 1-15-76 of 2015 and published in the Official Bulletin on January 2016. It was supplemented by the environmental assessment scheme, which is governed by the Environmental Impact Assessment Act 12-03 and reinforced by the Environmental Assessment Act 2020. The latter has placed on the shoulders of the mining operators several environmental measures that they must implement and respect in order to ensure a sustainable mining operation that preserves the environment, with the aim of minimizing the impact rate and the consequences of the mining sector on the environment. (S. TALBI ALAMI, 2018).

The purpose of the Moroccan Mining Act is to extend its scope to all mining products with industrial use. The legal arsenal intended for the regulation of the Moroccan mining sector tends to make this field more open and accessible to several actors, notably, by introducing other mineral substances, new mining titles and new authorizations, expanding the areas subject to mining and the duration of the operating licence and the introduction of environmental conservation provisions.

the problem that arises is the following : What is the impact of mines on the environment in Morocco?

Therefore, this research aims to contribute to the reflection on appropriate measures to protect the environment and reduce its dysfunction.

In order to achieve the above objectives, we will begin a methodology by sending forms to plant and mine managers as well as conducting field studies.

2. Article Maps

At this level of the article, we started with a brief overview and progressed to a presentation discussing the general research themes of the research being conducted. Shortly thereafter, we were able to outline the methodology that was approved and followed, discuss the results obtained, and directly discuss any recommendations or suggestions that could be adopted. Let us end the article with general conclusions and an inventory of all the articles and studies that we have adopted as a reference to enhance research.

3. Methodology

The method we have chosen to carry out this work is the positivist method and Interpretativism. Positivism is the method that starts from theory (phenomena, concepts, laws...) to discover reality. As for Interpretativism, it is the method that starts from the perception of the actors (opinions, opinions, text, meaning ...) to interpret reality (the field).

3.1: Data collection:

We opted for this choice of methodology because our work is based on an already existing law and therefore we interpret these applications in the field. Then we discuss these gaps and loopholes. This work targets a specific population, which is the companies that govern the mining sector on Moroccan territory.

The method we chose to conduct this study is a questionnaire distributed to mining companies in Morocco.

Based on the methodology used and the questionnaires disseminated, we processed the results using the SPSS tool.

3.2: Data Analysis:

We started our questionnaire to find out the type of mines that companies govern in Morocco. We find 50% in the field of phosphates, 25% in the field of rocks and industrial minerals as well as 25% in the field of ornamental rocks and precious stones.

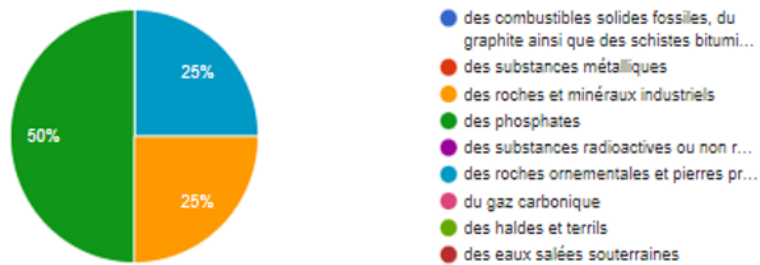


Figure 1. Types of mines controlled by enterprises in Morocco (%)

According to the figure above, we find that the preservation of the environment is very important for 75% of the companies governing the mining sector while 25% consider it important.

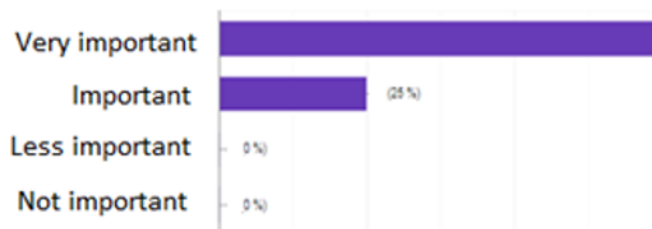


Figure 2. Importance of environmental preservation in the mining sector in Morocco (%)

Subsequently, Figure 3 shows 100% that it is the government that is responsible for preserving the environment in the mining sector.



Figure 3. Responsibility for environmental preservation in the mining sector in Morocco (%)

Mining companies responded positively by a percentage of 100% that waste from the mining sector has a very dangerous impact on the environment and human health.



Figure 4. Danger of waste on the environment, according to companies of the mining sector in Morocco (%)

Then, we find that for some companies, 50%, recognize that the law that governs the mining sector is very important, while for the 50% it is important.

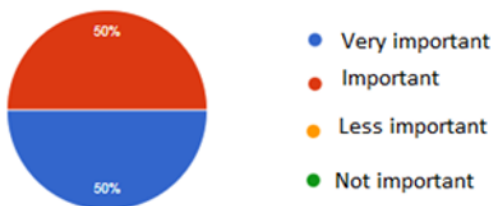


Figure 5. Importance of the law governing the mining sector by enterprises operating in Morocco (%)

Subsequently, we see that the expectations expected by companies in the mining sector are 100% logical.



Figure 6. Expected expectations of mining companies in Morocco (%)

Finally, we find that three-quarters (75%) are in favour of an EIA prior to any mining project, while 25% responded with an unfavourable opinion.

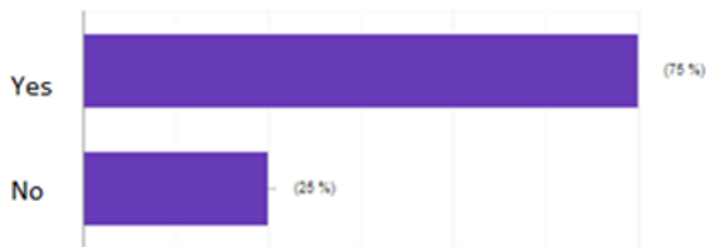


Figure 7. The *Pros* and *Cons* of EIA by Mining Companies in Morocco (%)

4. Results

There are different stages of mining activity, each with associated impacts: exploration of mineral deposits, construction and preparation of mines, processing of extracted minerals for their development and production of raw materials.

Mines are often located in areas where resources are greatest. Mining is a short-term economic activity and its closure has significant socio-economic consequences. Therefore, we must think about the closure and rehabilitation after the use of the mining area, mentioning that according to the results obtained, it is the government that is 100% responsible for preserving the environment and think about solutions for closing and rehabilitating the mining area.

Mining produces many types of waste that can contaminate the air, soil, water, flora and fauna. Mining can also have negative environmental impacts due to dust, noise and vibration, which occur mainly during excavation and blasting, but also during transportation activities. Exposure to radioactivity can also occur in certain types of operations, as shown by the results obtained on waste and its impact on the environment.

We are seeing various responses from companies in the field. Due to the favorable geological environment, mining is an important factor for Morocco's economic and social development (B. NADIR, 2017). The mine is characterized by a preponderance of phosphates, and the kingdom is the world's largest exporter with three-quarters of its reserves, base metals (e.g. copper, lead, zinc), precious metals (e.g. gold, silver), useful substance (e.g. barite, gypsum) and other products often exposed.

An environmental impact study identifies the environmental changes expected by the completion of a project. So it is very important to have a prior environmental impact study of any project, in order to minimize the danger rate on the environment as well as on human health. This is why 75% consider it a very important preliminary step before any mining project.

5. Discussion

A mine is considered abandoned when development ceases and the owner cannot be located, or when the owner refuses or is unable to restore the mining area.

Various scenarios can lead to an isolated and abandoned mine.

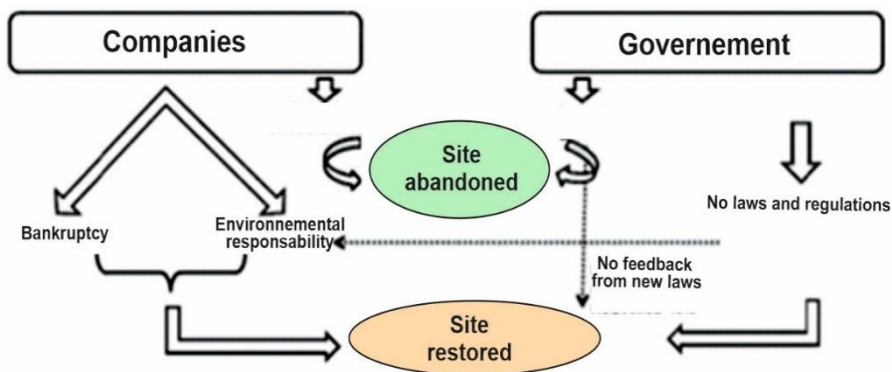


Figure 8. Scenarios that could lead to the abandonment of a mine site

Abandoned mines affect the state of the environment on many levels. These mainly have a visual impact on the landscape. These mines also pose a threat to human health and environmental quality: toxic chemicals and acid mixtures from past mining activities can contaminate surface and groundwater, flora and fauna. Therefore, knowing the laws that regulate the mining sector is considered important.

Sustainable development has three pillars and seeks a balance between these pillars: respect for the environment, social progress and economic efficiency. Working from a sustainable development perspective means systematically considering these three dimensions at each stage of a project's decision or development.

Companies must reduce the environmental impact of their activities and ensure that they respect it. They must also conserve resources as much as possible to ensure their availability for future generations. Finally, the report of the World Commission on Environment and Development considers the economic pillar of sustainable development to be fundamental: "*You must maximize your growth potential to meet your basic needs*". It is clear that sustainable development requires economic growth where these needs are not met.

Mining faces more challenges than any other major industrial sector on the road to sustainable development. Great efforts have been made to take into account the environment in the mining sector. These efforts have included the adoption of policies and strategies for the mining sector and the development of regulatory documents that take into account the needs of the environment and local communities.

6. Conclusion

Our work has been based on the impact of mines on the environment. The preservation of the latter in this sector is very important. It is up to the government to protect the environment and it is up to companies to comply with the laws and regulations in force to ensure this protection.

To conclude, an environmental impact study before any mining project is necessary, without forgetting that it is necessary to respect what the law stipulates. Then, and after use of the mining area, a closure and rehabilitation plan must be initiated in order to minimize the waste hazard rate and the environmental impact rate as well as guarantee resources for future generations. The challenge, therefore, is to ensure that current and future generations share in the benefits.

The plans consider the most appropriate ways to plan for and manage environmental changes and socio-economic impacts associated with decommissioning. Closure plans must be planned in advance and follow operational progress.

The mining sector must be mobilized to address the challenges it faces, engage diverse stakeholders and work in ways that bring direct economic, social and environmental benefits to local communities. The problem can be summarized as follows: How can we generate profits during and after mining operations while maintaining the quality of the environment and contributing to community development?

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