



Federal Institute
for Geosciences and
Natural Resources

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From Potential Assessment to Local Value Creation in Mauritania

Support of the non-metallic mining sector in Mauretania, Project Lead

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Outline



1. Introduction

Initial situation

Issue

Idea

2. Project

Conditions

Set up

Technical approach

Practical work and activities

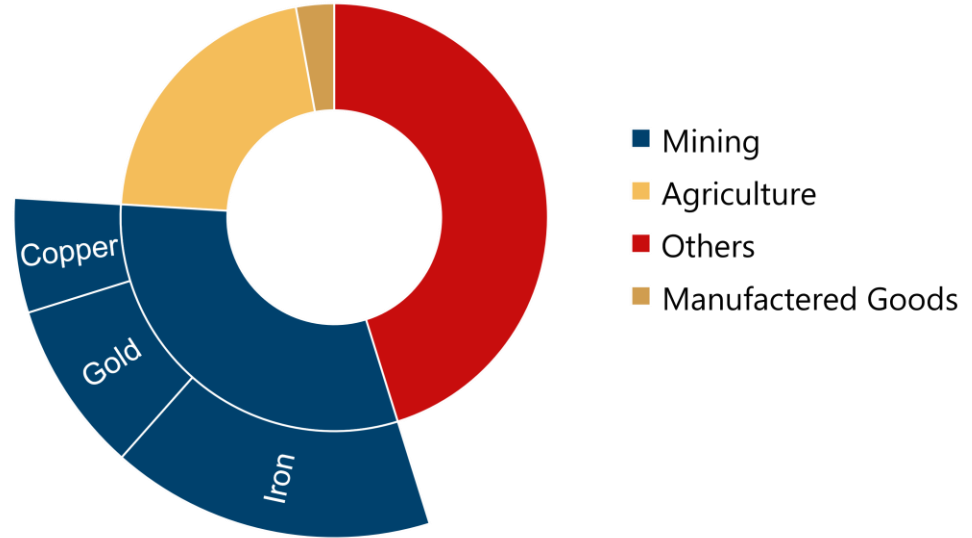
3. Example and results

Initial Situation

Raw materials sector

- Mining's contribution to GDP 23%
- Focused in metal production
- Focused on ROM Production

Contribution to GDP



Issue

- No Diversification
- No self supply
- High prices of imported goods
- Vulnerable to extern shocks
- No domestic processing
- No added value



Sharp drop in iron prices in 2008 and 2021, significantly lowering Mauritania's GDP

Idea of promoting the non metallic resources

- Diversify the export mining sector
- Help to absorb external shocks
- Can be used for self supply
- Easier processing techniques required
- Lower investment costs
- Domestic processing is possible
- Added value in the region is possible



Non-metallic resources have a very wide range of applications

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Project

The data situation on non-metallic resources in Mauritania is not yet sufficient. The data still need to be created or processed.

This is exactly where the project comes in



Project Conditions



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<i>Project:</i>	<i>Promoting the non-metallic resource sector in Mauritania</i>
<i>Original title:</i>	<i>Promotion du Secteur Extractif non-métallique en Mauritanie (PSENMM)</i>
<i>Budget:</i>	<i>2.5 Million €</i>
<i>Implementation period:</i>	<i>01.04.2020-31.03.24 (incl. 1 year KNV)</i>
<i>Partner organisation</i>	<i>Agence Nationale de Recherches Géologiques et du Patrimoine Minier (ANARPAM)</i>

Project set up

- BGR office in the partner's building
- The partner provides two offices
- Two BGR employees permanently on site

The overall goal is, that the partner (ANARPAM) is able to create and publish non –metallic resources data on its own.



Technical approach

The Upstream Value Chain of raw Materials

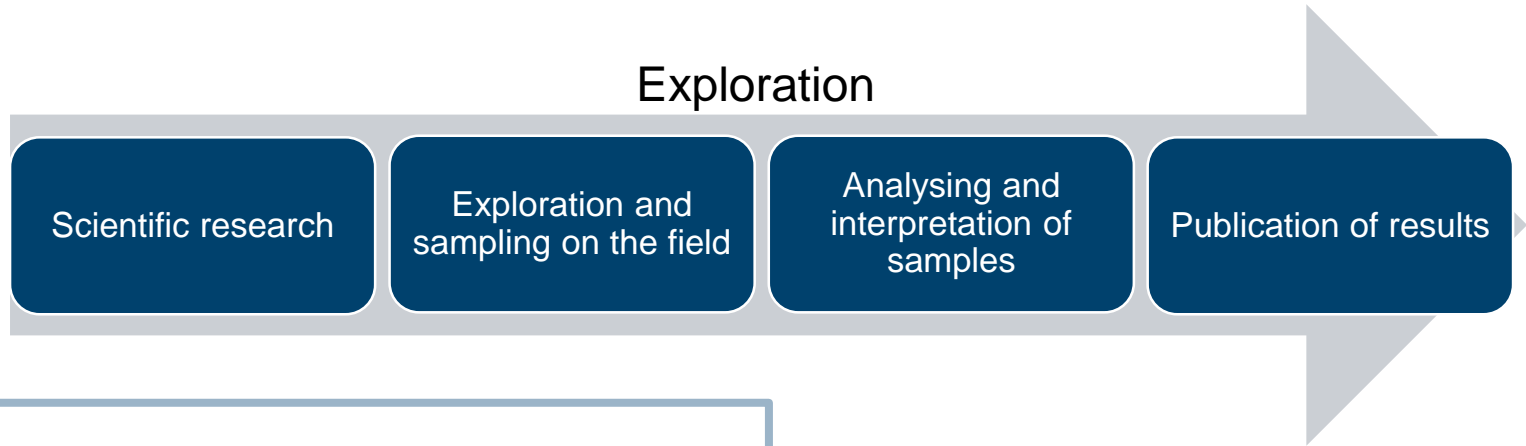


Our focus is on the steps that need to be taken before any mining can take place.

(Exploration)

Technical approach

The Exploration can be broken down into further sub-steps:



On every of these sub-steps our activities and trainings are planned.

Practical work and activities



Scientific Research

Training Greenfield Exploration



Mapping and Sampling on the Field

Training Field Maps



Drilling on the Field

Handling of the drilling rig and
Sampling

Practical work and activities



Training of Sampling



Analysing and interpretation of samples



Modelling of geological maps

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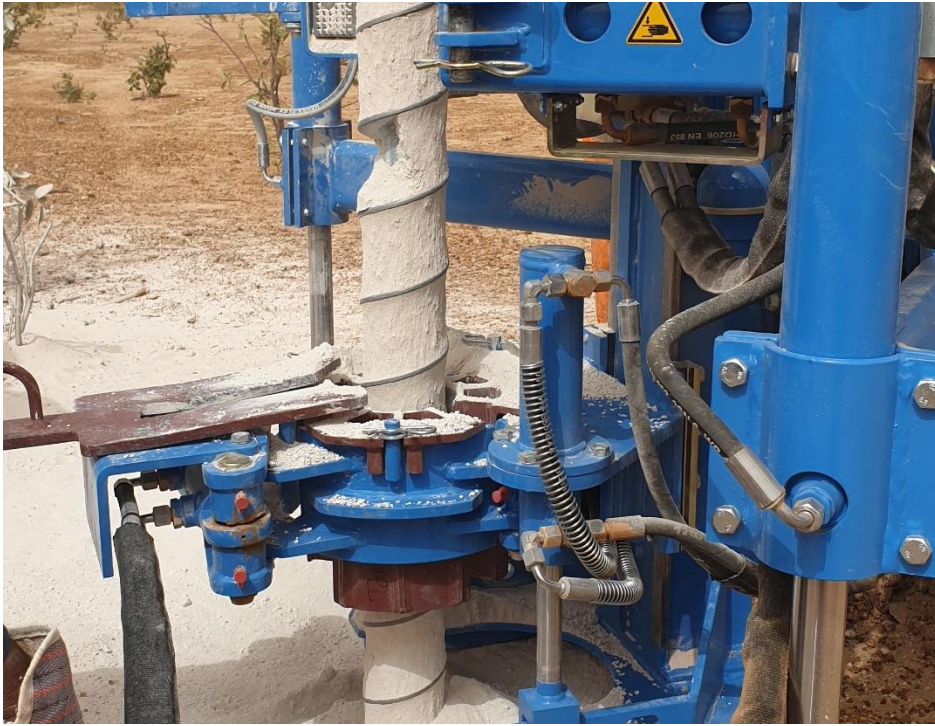
Set up

Technical approach

Practical work and activities

3. Example and results

Example Kaolin - Sampling



Sampling and Drilling in the kaolin occurrence

Example Kaolin - Analysing



Analysing the Kaolin samples

Example Kaolin - Interpretation




After evaluating the results, the information was converted into different products that can be used by investors.

Interpretation and evaluation of the laboratory results

Example Kaolin - Publication

ADVERTISEMENT FEATURE

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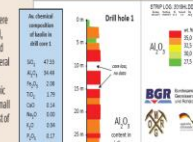
Mauritanian kaolin


A new and undeveloped kaolin deposit was evaluated in Mauritania during the course of a cooperation project between the German Federal Institute for Geosciences and Natural Resources (BGR) and the Mauritanian State Office for Geological Research (DMRG)

Up to the present, geological and mineralogical information on kaolin occurrences in Mauritania was virtually non-existent. The country has no history or record of kaolin mining. However, during the course of a recently conducted, German government-funded cooperation project between BGR and DMRG, an extensive kaolin deposit was discovered in southern Mauritania. The deposit at Hassi Abyad is situated about 200 km north of the Senegal River, and 50 km east of the district capital Niakhar. It is the first indication of a potential for kaolin mining in the country.

Occurrence
The kaolin at Hassi Abyad outcrops over several square kilometers in a slightly inclined and poorly vegetated peninsula. The kaolin is 85 % determined by XRD. Minor components were quartz (3%), goethite (2%), hematite (0.5%), rutile and anatase (< 1%), and a mineral from the scandiite group (0.7 %). Electron microscopic studies revealed a rather small primary particle size of most of the kaolinites (< 0.5 μm).

Geochemical composition
The Hassi Abyad deposit was explored in a first approach by drilling two auger drill holes in the northern part of the deposit (surface area of 800 m x 100 m with depths between 1 and 2 m). The Al₂O₃ content and average chemical composition in drill core from Hassi Abyad kaolin, and 31.6 % (arithmetical mean of analytical results). These figures correspond to mean



BGR 

DMRG/SGR
Niakhar
Mauritania

Publication of an article in the metal market magazine

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Article

Investigation of unexplored kaolin occurrences in southern Mauritania and preliminary assessment of possible applications

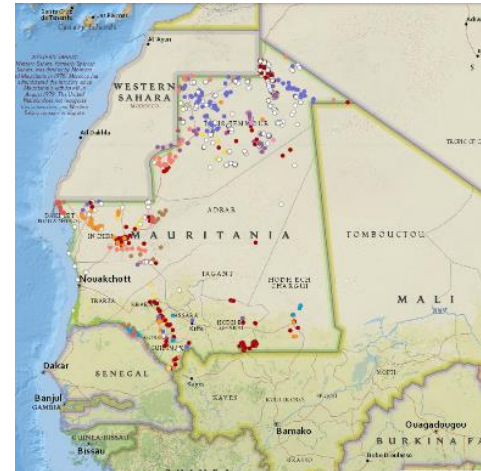
D. Küster¹, Stephan Kaufhold², Emanetoullah Limam³, Omar Jatoufi⁴, Oumar Ba⁴, Abdellahi Maham Zein Mohamed⁵, M. Pohmann-Lortz², M. Ranneberg¹ and K. Ufer¹

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Abstract
Non-metallic raw materials are largely unexplored in many African countries. In an attempt to reduce this knowledge gap, kaolin occurrences in three promising regions of southern Mauritania were examined. The aim of the paper is to describe the occurrences and characterize the material in terms of mineralogy and potential technical use in the ceramics industry. The kaolin is geologically associated with various sedimentary rock units in either the Coastal Basin (Kaedi), the Mauritanide Belt (Hassi Abyad) or the Taoudeni Basin (Niéma). Geochemical data show Al₂O₃ contents of between 9% and 38% (corresponding to 23–96% kaolinite). Samples from the Hassi Abyad and Kaedi regions have greater kaolinite contents on average and were further investigated mineralogically. The kaolin from the Niéma region contained less kaolinite (<50 mass%). The region is also less accessible and hence is not considered further in this study. X-ray diffraction, X-ray fluorescence and infrared spectroscopy confirmed the geochemically calculated kaolinite contents of the kaolins and identified quartz, anatase and goethite as the remaining major mineral constituents. The degree of structural disorder of the kaolinites (determined by infrared spectroscopy) is generally greater in the Kaedi occurrence than at Hassi Abyad. Ceramic tests proved that all of these kaolin raw materials might be used for the production of ceramics, and some may even be used for fine ceramics. From an economic point of view, the Hassi Abyad deposit is interesting in terms of its quality and reserves, aspects that will be addressed in detail in a follow-up study.

Keywords: clay mineralogical characterization, deposit, kaolin, Mauritania, non-metallic raw material
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Publication of an article in the Clay Minerals Magazine

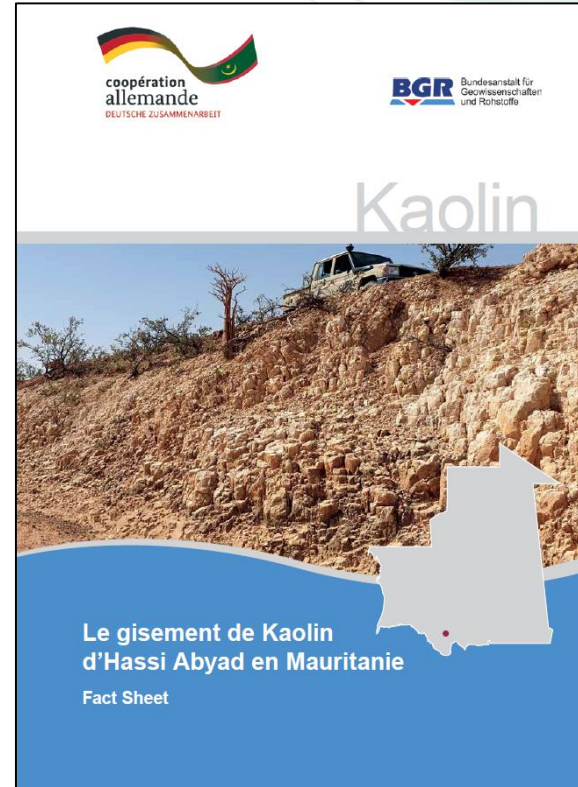


Publication of the results on an interactive Map on a project website

Example Kaolin - Publication

A factsheet was prepared in French, English and German and distributed and handed out in digital and paper form on different events.

Front page of the fact sheet in French



Example Kaolin - Publication



Exhibition stand at the Mining INDABA in Cape Town (ZA)



Example Kaolin - Result



"Implementing Responsible Mining for the Just Transition"

Example Kaolin - Result



SMB MINING-Sarl

- Will Employ up to 300 people
 - Will Produce 100 Mt/a
 - Low to no Mine Wastes
 - Paved a road to the deposit (45km)
 - Construction of a Stockpile at the River (Rosso)
 - Delivery to Dakar
 - Unique Kaolin for large tiles (1-1.5 m)
- Employs already 800 People
 - Produces 58,000 m² tiles /d
 - Create more jobs by increasing production
 - Export Tiles to Whole West- and Nord Africa.



Example Kaolin - Result

SMB is considering building its own plant in Mauritania in parallel.

They already have a JV with a Spanish partner for financing.

SMB is currently in contact with the AKW (Amberger Kaolinwerke).

500 kg of Kaolin were sent to Germany to dimension a potential processing plant.

- The industry of non-metallic raw materials has the potential to develop independently and thus to grow on its own.
- Unique dynamics can show up in the raw materials sector.
- Precise thoughts about the use of capacities has to be made in advance.
- The possible impacts of activities must be evaluated by experts.