Federal Institute for Geosciences and Natural Resources

“Holistic geoscientific capacity building for responsible local value creation”

BGR/BMZ-Project experiences from Namibia and Mauritania

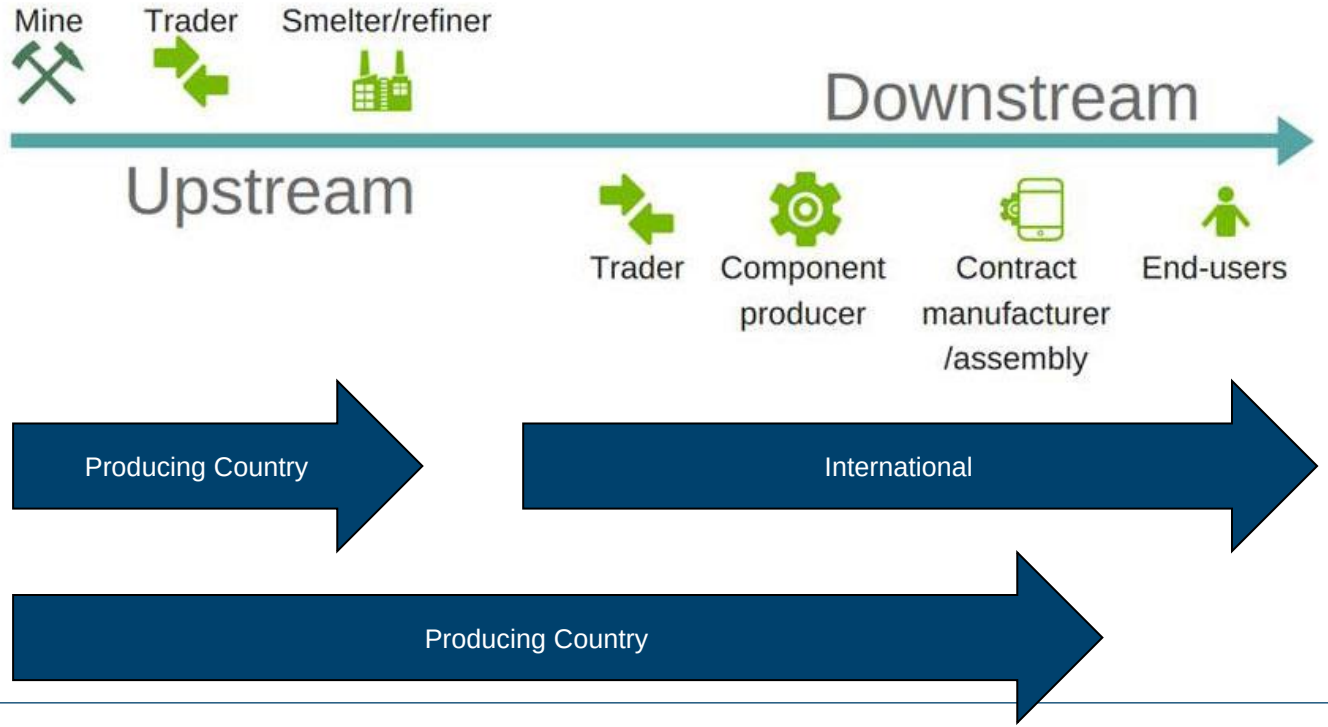
Federal Institute for Geosciences and Natural Resources

Dr. Wibke Crewett

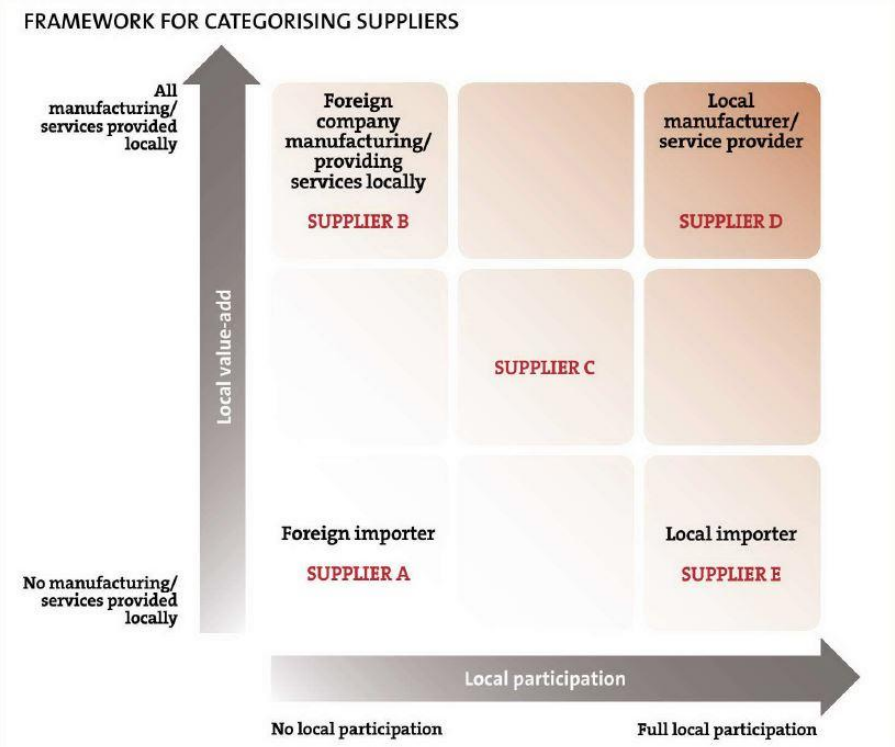
Improving benefit sharing – how to assess local income opportunities from mining?

Sectoral Progamme Raw Materials and Development

Contact: wibke.crewett@bgr.de


Mine
Trader
Smelter/refiner
Downstream
Upstream
Trader
Component producer
Contract manufacturer /assembly
End-users
Producing Country
International
Producing Country

Local Content and Local Procurement



The **value** brought to the local, regional or national economy from an extraction project is referred to as the **local content.**

NRGI Reader – Local Content, 2015

⇒ Procurement is often the biggest single expense category of the mining industry in order to create local content

Source: Kaiser EDP, 2014

LION tool – an instrument for policy advise

- LION tool = Local Investment Opportunities on Natural Resource Projects
- Western Africa = Gold
- Copperbelt (DR Congo and Zambia) = Cobalt/Cupper

What does it do?

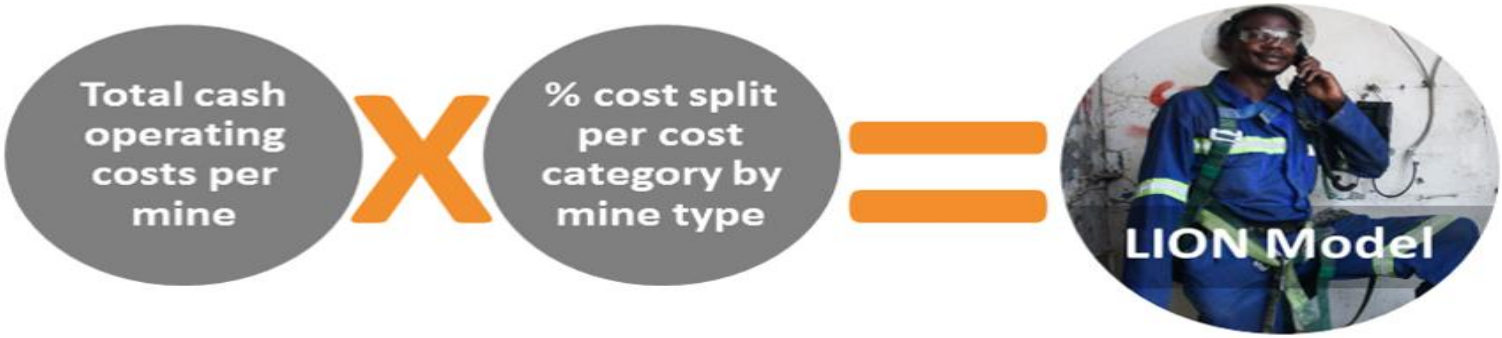
- Models the **procurement expenditure** of mining companies
- **Divides these expenses into various supplying categories**

What is it's purpose?

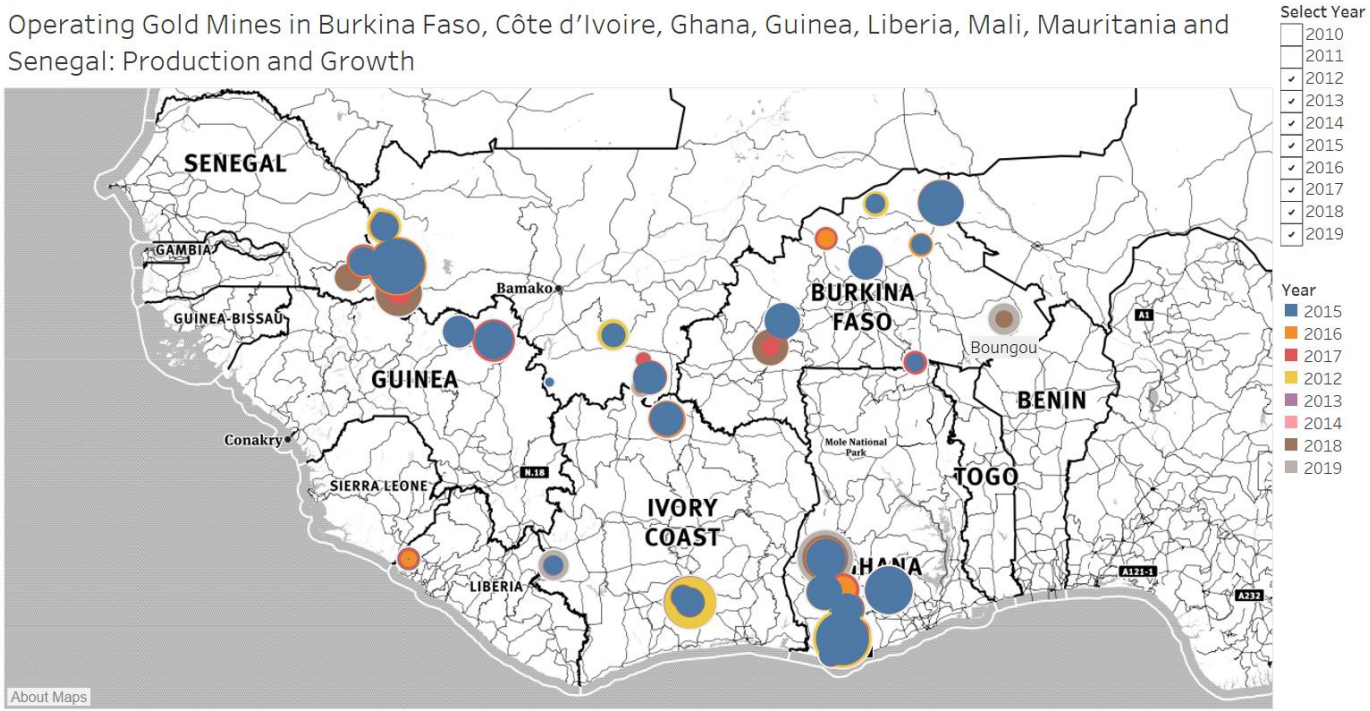
- Inform local suppliers and policy makers on local procurement in the mining sector
- Make specific investment opportunities visible for local mining suppliers
- Support local governments in their approach towards local content policies
- Support the local economy in diversifying the economy

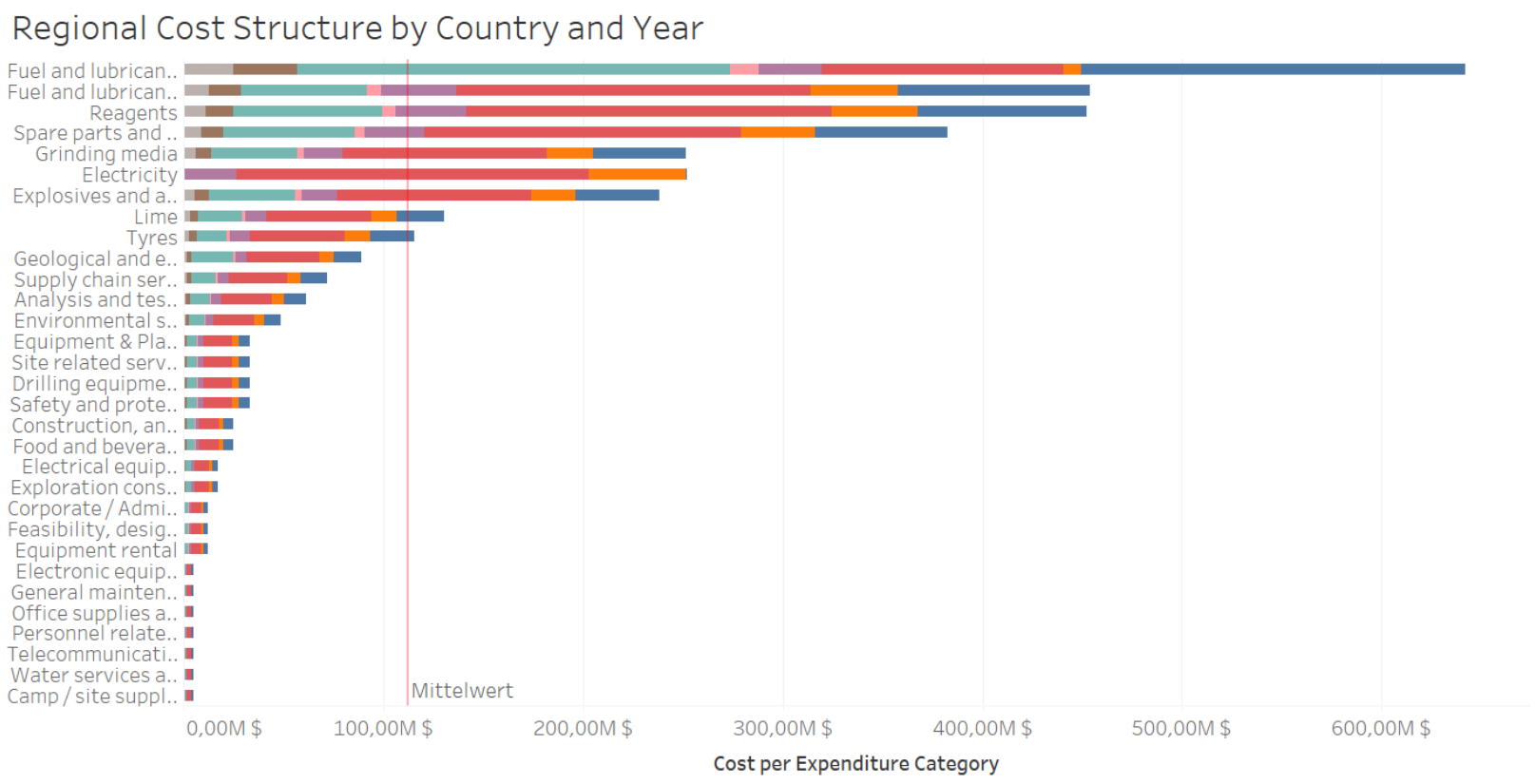
The LION Model

How does it work?



Operating Gold Mines in Burkina Faso, Côte d'Ivoire, Ghana, Guinea, Liberia, Mali, Mauritania and Senegal: Production and Growth




Regional Cost Structure by Country and Year
Fuel and lubrican..
Fuel and lubrican..
Reagents
Spare parts and ..
Grinding media
Electricity
Explosives and a..
Lime
Tyres
Geological and e..
Supply chain ser..
Analysis and tes..
Environmental s..
Equipment & Pla..
Site related serv..
Drilling equipme..
Safety and prote..
Construction, an..
Food and bevera..
Electrical equip..
Exploration cons..
Corporate / Admi..
Feasibility, desig..
Equipment rental
Electronic equip..
General mainten..
Office supplies a..
Personnel relate..
Telecommunicati..
Water services a..
Camp / site suppl..
Mittelwert
0,00M $
100,00M $
200,00M $
300,00M $
400,00M $
500,00M $
600,00M $
Cost per Expenditure Category
Select Country
Burkina Faso
Côte d'Ivoire
Ghana
Guinea
Liberia
Mali
Mauritania
Senegal
Select Year
2010
2011
2012
2013
2014
2015
2016
2017
Country
Burkina Faso
Côte d'Ivoire
Ghana
Guinea
Liberia
Mali
Mauritania
Senegal

Next steps

1. LION Updates – Production data (international data bases) + procurement cost split data (field reserach)
2. Practitioners‘ evaluation and verification of policy makers‘ information demand
3. Explore procurement policy environments
4. LION extension: Explore income opportunities/ Gendered disaggregation
5. Get engaged in policy dialogue on procurement and local content policies

Federal Institute for Geosciences and Natural Resources

Martin Quinger

Capacity Building and Digitalization: Raw Material Sector Potential Assessment in Namibia

GSN-BGR-Project Sustainable Use of Namibias' Mineral Potential, Project Lead

Contact: martin.quinger@bgr.de

How can technical cooperation foster investments in responsible, local value addition? - The role of information, communication and explanation.




Martin Quinger

GSN-BGR-Project “Sustainable Use of Namibia’s Mineral Potential”

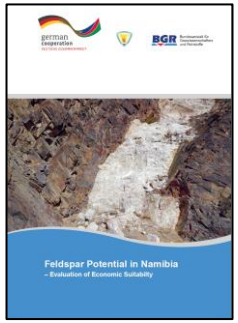
Federal Institute for Geosciences and Natural Resources (BGR)

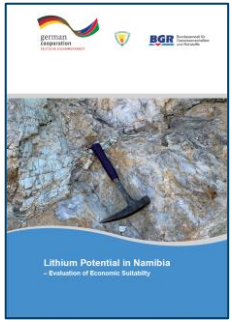
What is needed to make investors invest? (…in raw materials, responsibly, local…)

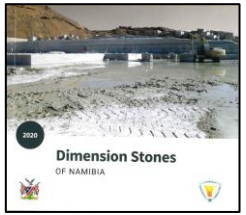
- For two geological surveys, no real question: As much geoscientific information for different commodities as possible.
- Easy, digital access to it.
- Information on adminstrative and legal framework
- Information on economical aspects, infrastructue, energy etc.
- Focus on Critical Raw Materials (CRM) and Industrial Minerals

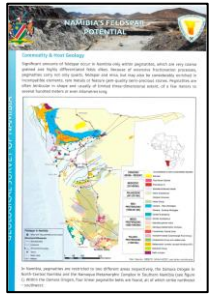
Project Activities

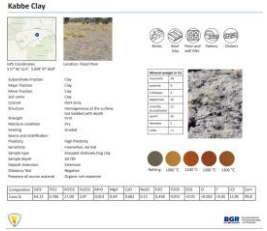
- Preparation of mineral potential (value-addition) studies for lithium, feldspar and other commodities as well as downstream study for the glass industry.
- Development of prospectivity maps in the Kunene Region.
- Completion of promotional material for investors (e.g. Clay Catalogue, Dimension Stone Catalogue, Mineral Commodity Handouts).
- Capacity development training for EGD staff including economic assessment of mineral deposits



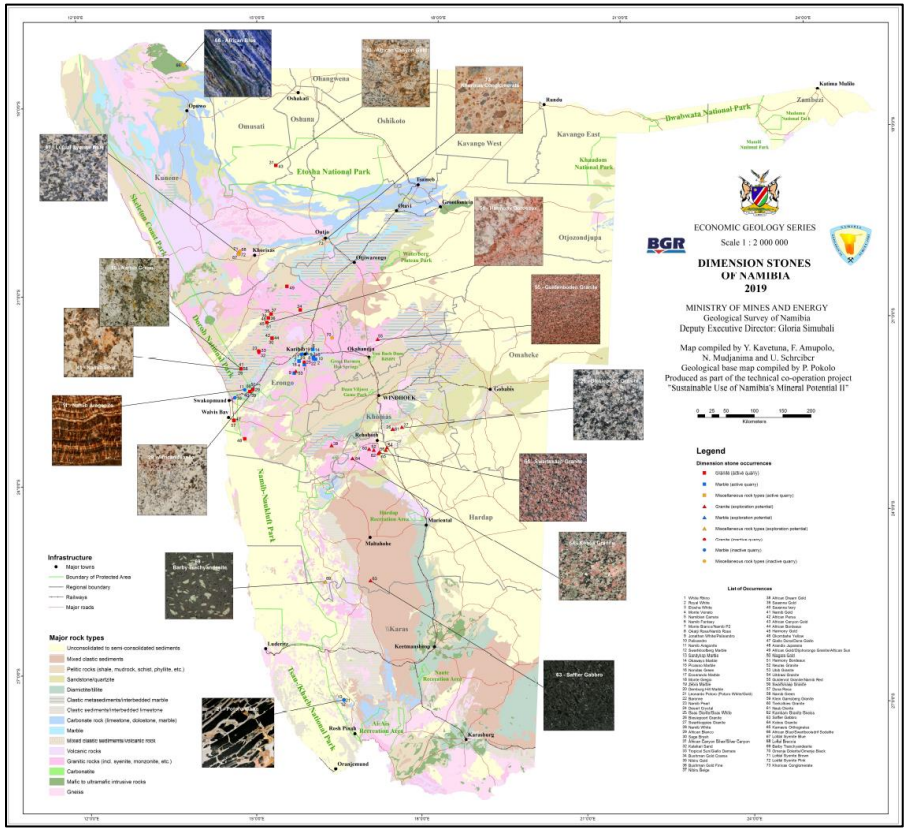








Thematic maps

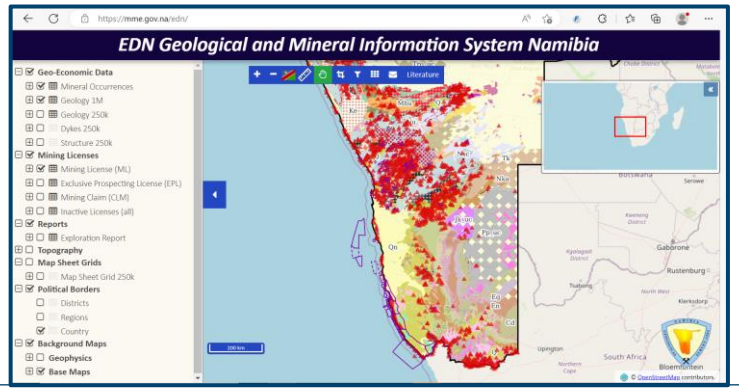


Dimension Stones of Namibia

Project Activities cont.

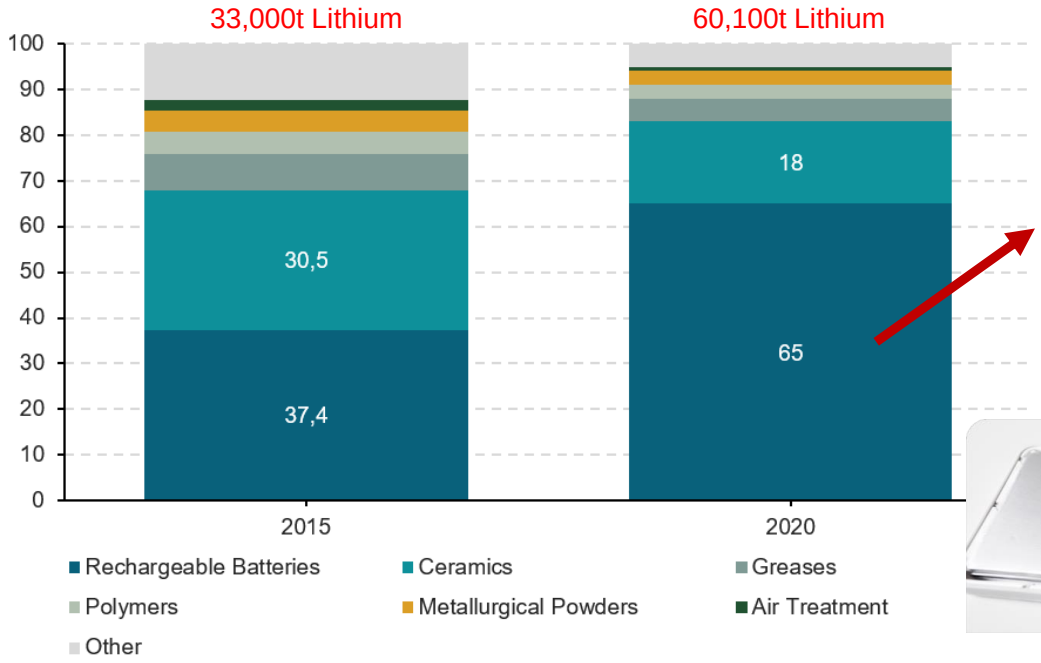
Improving Access to (digital) economic geoscientific information:

- Digitizing e.g. EPL Reports.
- Development of an integrated digital strategy
- Implementing an improved web-host for freely available data.



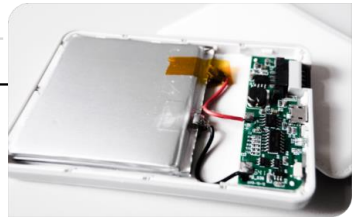
Lithium demand 2015 vs 2020 and beyond…

IT IS ALL ABOUT LITHIUM-ION-BATTERIES



Demand
> 350,000t
Lithium in 2030

Up to 90 %
In 2025

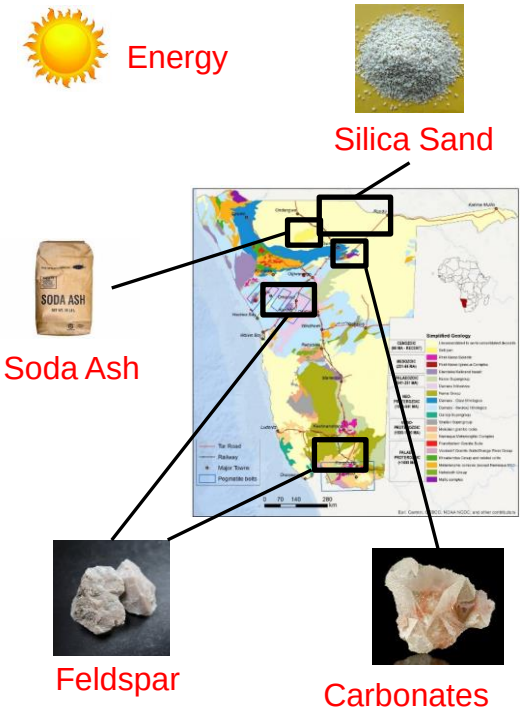


Feasibility Study Namibian Glass Industrie

- In cooperation with NUST.
- Assessment of raw material availability
- Description of Infrastructure requirements and availability with focus on energy.
- Marketanalysis national and regional.

Preliminary Results:

- ✓ Namibia has all major raw materials in suitable quality and quantity
- ✓ Currently, all glass products are imported. Future demand is increasing. Good potential for export.
- ✓ Possible synergies with renewable energy development.
- ✓ Positive economic evaluation with very positive socio-economic impact.



Is just providing information sufficient?

- **Who is the primary receiver of the various?**
  Education, age group, social context etc.

- **How is the information delivered/accessible?**
  Actively/passively? Receiver oriented language and format?

- **To whom is the information forwarded? In which way?**
  News are spreading out. Are we in control?

- **What did each member in this information chain understand?**
  “This is not what I meant or said!”

Examples of misconceptions from the project

The Politician

Does not get the facts right, but sets the direction for action on it…

The Admin

Tries to mitigate budget cuts with short term solutions.

The Community

Wants and needs to participate, but gets hooked on wrong promises and hopes.

The Journalist

Creates unintentional „fake news“, while being the most important multiplicator

The Investor

If they fail once because of inadequate or wrong information, they never come back!

Thank you for your attention!

Martin Quinger

Projectmanager GSN-BGR-Project

Federal Institute for Geosciences and Natural Resources (BGR)

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Omar Jatlaoui

From Potential Assessment to Local Value Creation in Mauritania

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

Contact: omar.jatlaoui@bgr.de

Outline

1. Introduction
    - Initial situation
    - Issue
    - Idea

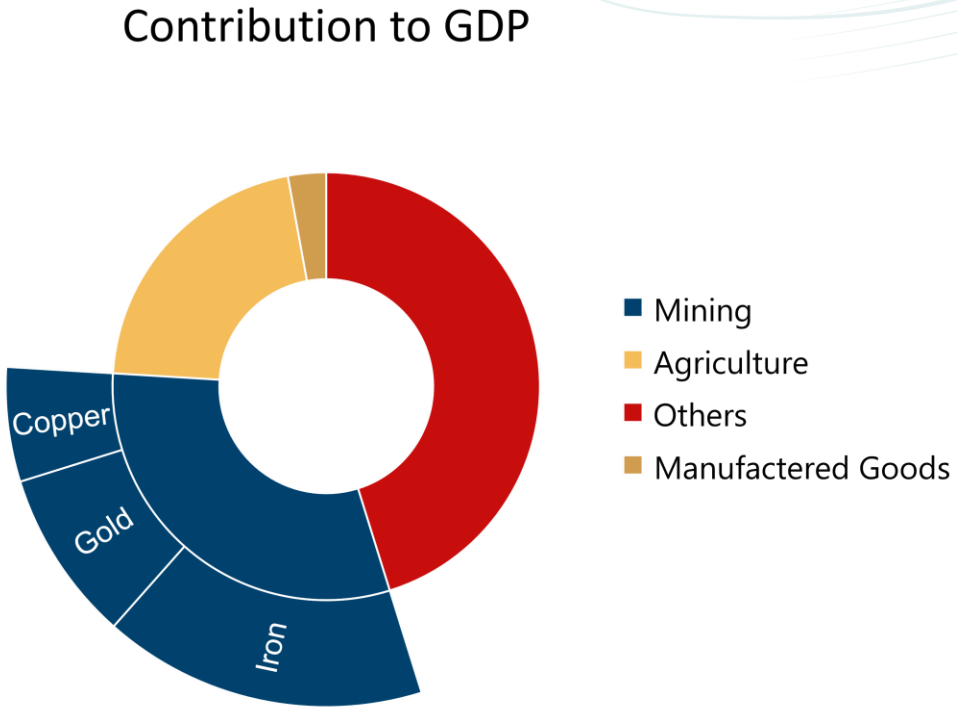
2. Project
    - Conditions
    - Set up
    - Technical approach
    - Practical work and activities

3.Example and results

Initial Situation

Raw materials sector

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



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

Outline

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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

Federal Institute for Geosciences and Natural Resources

Agence Nationale de Recherches Géologiques et du Patrimoine Minier

coopération allemande
DEUTSCHE ZUSAMMENARBEIT

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

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

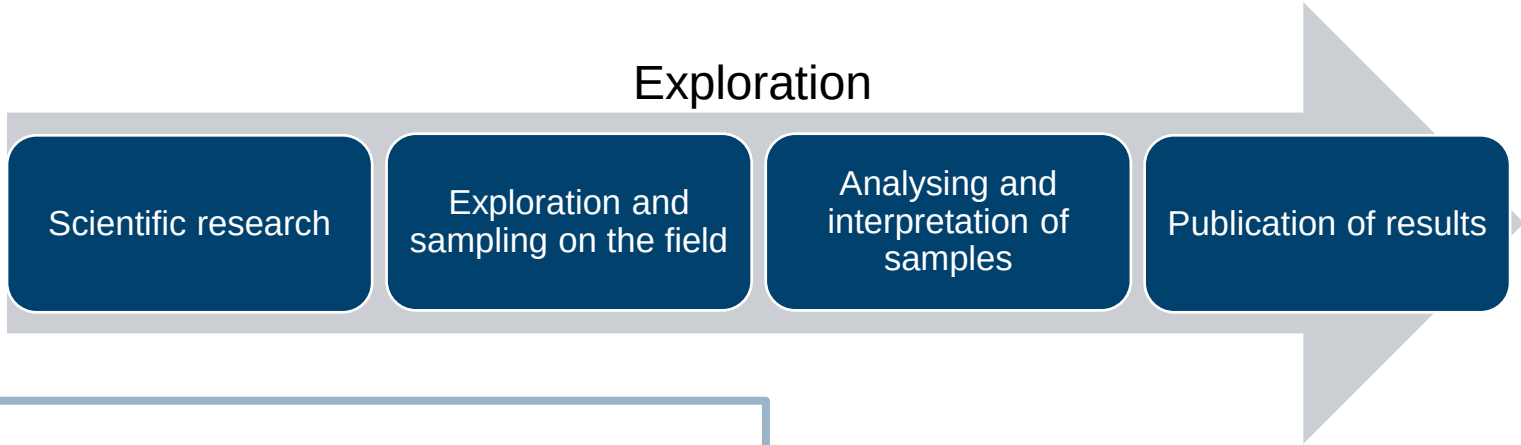
The Upstream Value Chain of raw Materials

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

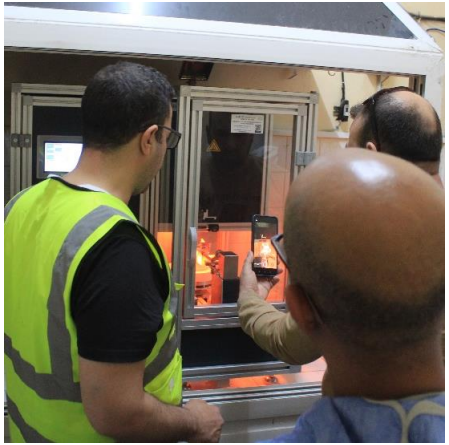
Training Field Maps

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

Outline

1. Introduction
    - Initial situation
    - Issue
    - Idea

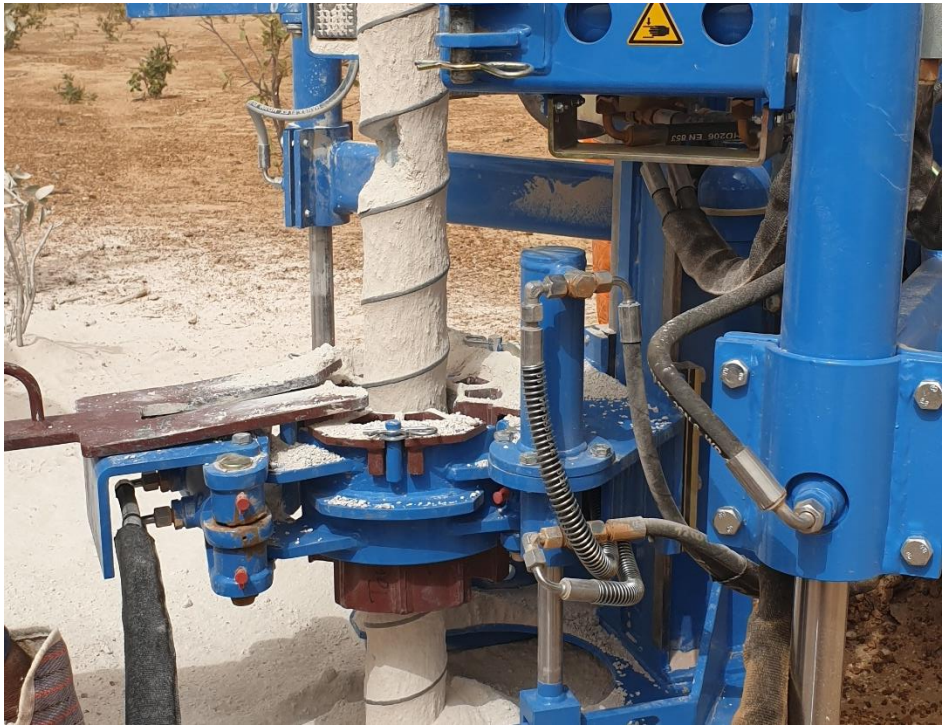
2. Project
    - Conditions
    - Set up
    - Technical approach
    - Practical work and activities

3.Example and results

Example Kaolin - Sampling

Sampling and Drilling in the kaolin occurrence

Example Kaolin - Sampling



Sampling and Drilling in the kaolin occurrence

Example Kaolin - Analysing

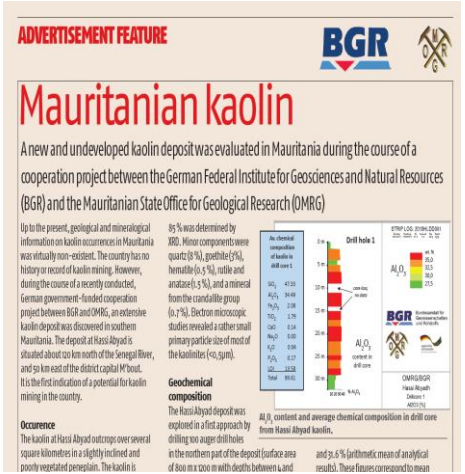
Analysing the Kaolin samples

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

BGR

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 (OMRG)

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 OMRG, an extensive kaolin deposit was discovered in southern Mauritania. The deposit at Hassi Abyad is situated about 120 km north of the Senegal River, and 50 km east of the district capital M'bout. It is the first indication of a potential for kaolin mining in the country.

Occurence

The kaolin at Hassi Abyad outcrops over several square kilometres in a slightly inclined and poorly vegetated peneplain. The kaolin is

85 % was determined by XRD. Minor components were quartz (8 %), goethite (5 %), hematite (0.5 %), rutile and anatase (1.5 %), and a mineral from the crandallite group (0.7 %). Electron microscopic studies revealed a rather small primary particle size of most of the kaolinites (<0.5µm).

Geochemical composition

The Hassi Abyad deposit was explored in a first approach by drilling 100 auger drill holes in the northern part of the deposit (surface area of 800 m x 1200 m with depths between 4 and

Drill hole 1

OMRG/BGR Hassi Abyad Deltion 1

Al_2O_3 content and average chemical composition in drill core from Hassi Abyad kaolin.

and 31.6 % (arithmetic mean of analytical results). These figures correspond to mean

Publication of an article in the metal market magazine

Clay Minerals (2021), 1–14
doi:10.1180/clm.2021.26

CAMBRIDGE UNIVERSITY PRESS

Article

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

D. Küster[1], Stephan Kaufhold[1]*, Emanetoullah Limam[2], Omar Jatlaoui[2], Oumar Ba[2], Abdellahi Maham Zein Mohamed[2], M. Pohlmann-Lortz[3], M. Ranneberg[1] and K. Ufer[1]

[1]BGR, Stilleweg 2, D-30655 Hannover, Germany; [2]Agence Nationale de Recherches Géologiques et du Patrimoine Minier (ANARPAM), Nouakchott, Mauritania and [3]Forschungsinstitut für Anorganische Werkstoffe – Glas/Keramik – GmbH (FGK), Heinrich-Meister-Straße 2, D-56203 Höhr-Grenzhausen, Germany

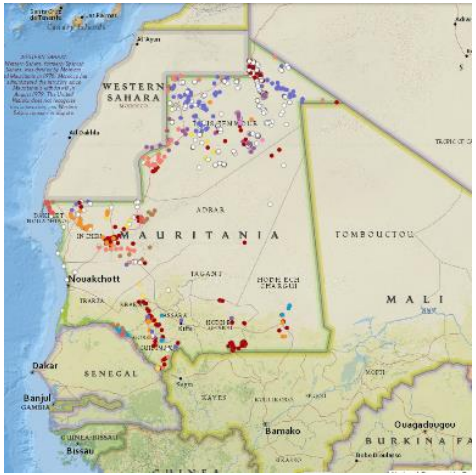
Abstract

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 characterise the material in terms of mineralogy and potential technical use in the ceramics industry. The kaolins are geologically associated with various sedimentary rock units in either the Coastal Basin (Kaédi), the Mauritanide Belt (Hassi Abyad) or the Taoudeni Basin (Néma). Geochemical data show Al_2O_3 contents of between 9% and 38% (corresponding to 23–96% kaolinite). Samples from the Hassi Abyad and Kaédi regions have greater kaolinite contents on average and were further investigated mineralogically. The kaolin from the Néma 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 Kaédi occurrences 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

(Received 20 May 2021; revised 21 July 2021; Accepted Manuscript online: 11 August 2021; Associate Editor: Javier Huertas)

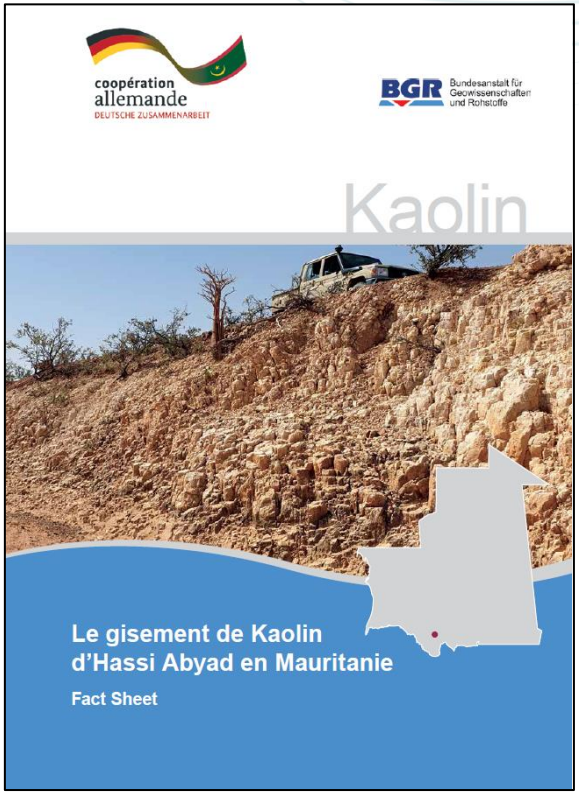
Publication of an article in the Clay Minerals Magazine



Publication of the results on an interactice 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

Example Kaolin - Result

SMB MINING-Sarl

- Will Employ up to 300 people
- Will Produce 100 Mt/a
- Low to no Mine Wastes
- construct 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)

Twyford
Better tiles, Better life

- 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.