

Sustainability in the Extractive Industry

Economic, Environmental, and Social Impacts of Mining activities in the Global South

Minerals and metals play increasingly important role in supporting the energy transition and the decarbonisation of the world's energy systems. To produce batteries, renewable generation components, and transmission lines, countries demand growing volumes of copper, cobalt, nickel, lithium, and other elements. To supply those, the mining industry has to grow its operations around the world, especially in the countries of the Global South. The extraction of natural resources, however, comes at significant environmental and social costs.

The aim of this project study is to collect the data and analyze the impact of mining activities in the Global South region. We look for students interested in the topic of sustainability to join the team and work together to:

- Compile a dataset, using the World Bank, UN, Global Data Lab, Afrobarometer, Extractive Industries Transparency Initiative (EITI), and other relevant sources, to quantify the sustainability of the processes (by analogy with the UN Sustainability Goal indicators).
- Apply data mining and machine learning techniques to analyze the economic, environmental, and social impacts of mining, their historical and regional trends.
- Identify champions and falling behind regions and individual mining sites with respect to sustainability.

The expected project deliverables include:

1. Database of attributes, which characterize the decision and outcome variables related to mining activities and their economic/environmental/social impacts in the Global South.
2. A system of KPIs (by analogy with the sustainability indicators) quantifying sustainability in mining, accompanied with the relevant data analysis.
3. A final report presenting the results of the data analytics work and discussing recommendations for mining operators and communities.
4. A presentation summarizing the project findings for the relevant stakeholders.

Requirements:

- Registration in a master's level study program at TUM, any relevant department.
- Interest in fostering sustainable practices in the extractive industries.
- Familiarity with the UNSGs *is a plus*.
- Experience in exploratory data analysis with Python or R *is a plus*.

Application procedure:

You can apply individually or in teams by sending your CV and transcript of grades to CEM@wi.tum.de. Please put "Project Study on Extractive Industries" in the subject line.