Earth Observation for Monitoring and Observing Environmental and Societal Impacts of Mineral Resources Exploration and Exploitation

Developing a sustainable "trialogue" between mining industry, regulators and the civil society

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Outline

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Introduction

In 2007, the European Commission Vice President, responsible for Industry policy declared that

"*European industries need predictability in the flow of raw materials and stable prices to remain competitive. We are committed to improve the conditions of access to raw materials, be within Europe or by creating a level playing field in accessing such material from abroad*".

General Context

- ETP SMR Strategic Research Agenda
- EU:
  Raw Materials Initiative,
  Sustainable Development Strategy,
  Thematic Strategy for the Sustainable Use of Natural Resources
- International:
  ICMM Sustainable Development Framework,
  SDIMI,
  African Mining Vision 2050,
  African Mining Partnership (AMP)

Objectives

- Assessment of policy requirements at macro (public) and micro (mining companies) levels
- Definition of environmental, socio-economic, societal and sustainable development criteria and indicators to be possibly dealt using Earth Observation (EO);
- Using existing EO knowledge and carry out new developments on demonstration sites to demonstrate the capabilities of integrated EO-based methods and tools in monitoring, managing and contributing reducing the environmental and societal footprints of the extractive industry during all phases of a mining project and
- Contribute making available reliable and objective information about affected ecosystems, populations and societies, to serve as a basis for a sound “trialogue” between industrialists, governmental organisations and stakeholder

Methodology (1/3)

- Analysis of policies related to environmental and social footprint of mineral industries
- Develop high level EO-based data products applicable to the different stages of mining activities within the life cycle of mining operations, over three demonstration sites
  - Sokolov (CZ), lignite open cast mine
  - Witbank (ZA), coalfield
  - Kumtor (KS), gold mine

Methodology (2/3)

- Collecting different EO data of the three demonstration sites
  - Satellite data
    Conventional optical sensors, very high resolution optical sensors, radar sensors, InSAR applications
  - Airborne data
    Airborne imaging spectroscopy (hyperspectral) survey, airborne geophysics (radiometric, electromagnetic, aeromagnetic)
  - In-situ monitoring methods
    ALERT (time-lapse electrical resistivity tomography), ground monitoring network, in-situ point measurements, field spectroradiometry campaigns, information and/or measurements about/of vegetation, soil, groundwater and dust, chemical model and 3D characterisation of the contaminated soil

Methodology (3/3)

- Contribute to the development of generic EO data integration schemes, in particular in view of characterising affected ecosystems, populations and societies and prepare indisputable documents for target groups
- Feed reliable and objective information about affected ecosystems, populations and societies into the sound “trialogue” between industrialists, governmental organisations and stakeholder

Project Data

- Funding Instrument: **CP-SICA-FP7**
- Total Project Costs: **4.062.877 €**
- EC Contribution: **3.120.837 €**
- Duration: **36 months**
- Consortium: **12 (14) partners from 7 (8)**
- Coordinator: **brgm (France)**
- Start Date: **01 February 2010**
- Web Site: **http://www.eo-miners.eu**

Expected Results

- EO-based tools for helping monitoring and observing the impact on the environment and on the society of the exploration and exploitation of mineral resources.
- Address GEO (Group on Earth Observation) and GEOSS (Global Earth Observation System of Systems) process and tasks, by using project outputs to define core elements of an environmental observing system and examining how this system fits in GEO and contributes to building GEOSS
- Means for a sound "trialogue" (definition: "*An interchange and discussion of ideas among three groups having different origins, philosophies, principles, etc*.") between the three main groups involved, the industry, governmental organisations and other stakeholders (e.g. NGOs)

Work already Done

- Establishment of internal and external communication
- Field trips to Witbank (ZA) and Sokolov (CZ) for data collection and meeting with local stakeholders
- Policy assessments on micro and macro level
- Identification of third test site after withdrawal of Anglo Chile -> Kumtor gold mine, Kyrgyzstan

Conclusions

- Establishing EO methods and tools for environmental and societal impact assessment of mining activities is a promising approach
- Inclusion of the topic “minerals” in the GEO/GEOSS processes is crucial for the sector
- Successful “trialogue” will significantly contribute to sustainability in the minerals sector

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Ladies and gentlemen, thank you very much for your attention

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