Global Webinar on Geospatial and Other Data Sources for Environment Statistics:
Assessing the Impact of the Economy on the Environment

Detection of mining activities and its impacts on the environment

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Context
Artisanal and small-scale gold mining is an important economic activity in developing countries with gold resources.
Artisanal gold mining: an activity motivated by poverty

Employment: 8 million people (direct employment) and 46 million people (dependent)
Artisanal gold mining: a threat to the environment, health and society

Child labor, deforestation, insecurity, water pollution, DMA, soil degradation etc.
Efforts to regulate artisanal gold mining

Over the past several years, governments such as Ghana, Côte d'Ivoire, and Senegal have embarked on the process of promoting legal artisanal and small-scale gold mining with best practices, and to control and monitor illegal expansion of mining sites.

Thus, new reforms on gold panning have been decided. These laws consist, among other things, of creating official perimeters for artisanal gold mining within which the activity of gold panning would be declared and legal.

- In Senegal Order No. 009249 of June 14, 2013 appointing: "Ministerial Order on the organization of artisanal gold mining".


Current challenges for the implementation of these reforms

A constant evolution of gold panning activities driven by the discovery of new mining sites and the abandonment of less profitable sites. This reality is sometimes incompatible with the definition of official perimeters.

Because of the distance and lack of objective information, it is difficult to regularly monitor ongoing activity and to verify if/when activities take place outside these corridors.

Need to make frequent field campaigns which can be very costly for the institutions in charge of the regulation of the activity.

Contribution of space technologies
Monitoring of artisanal gold mining sites from space

Photo: Vue du ciel d’un sentier de cyanuration à Kokumbo, Côte d’Ivoire © MINERWA2021, Universciences
Observations from space can be used to detect mine sites and assess their impact on the environment.
Remote sensing and artisanal mining: the different applications


- **Deforestation** (Rahm et al. 2014; Schueler et al. 2011; Poudori et al. 2001; Caballero Espejo et al. 2018; Diringer et al. 2020; Asner et Tupayachi 2016; Asner 2009; Swenson et al. 2011)

- **Soil degradation and acid mine drainage** (Almeida-Filho 2002; Telmer et Stapper 2007b; Lobo et al. 2016; Abass Saley et al. 2021; Seifi et al. 2019; Shahriari et al. 2013; Mielke et al. 2014)

- **Water pollution** (Lobo 2015; Gallay et al. 2018; Linares 2019; Lobo et al. 2018; Robert et al. 2016)

Identification, detection and mapping of artisanal gold mining sites
Development of artisanal gold mining along the Bandama River (Côte d'Ivoire)
Ngom et al. (2022)
Recent expansion of artisanal gold along the Bandama River (Côte d'Ivoire)
Ngom et al. (2022)

Expansion de l’orpaillage entre 2018 et 2021
Identification and mapping artisanal gold mining sites in Senegal
Ngom et al. (2020)
Development of a real-time monitoring tool for gold mining sites in Senegal

ASGM Watch

Surveillance des activités d’orpaillage au Sénégal


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Liste des couloirs d’orpaillage officiels du Sénégal

- BANTAKOKOUTA
- BALANKONKO
- BAQATA
- BONDALAL
- DAOROLA
- DIABOUSSO

Décembre 2015
Governance of gold panning informed by remote sensing observations: social and ethical aspects

For the governance of the mining sector, it is true that remote sensing will certainly not answer questions related to gender issues, labor relations, insecurity on mining sites and migration, which are all inclusive parts of the process....

- Using remote sensing in a reflexive manner that captures the social and political implications of gold mining governance
- Promote access to information and improve knowledge across levels of government.

Remote sensing now allows for the identification of gold panning sites, the mapping of soil degradation, deforestation, the characterization of sediment discharges into rivers, and the short- or long-term mapping of the expansion of artisanal gold mines and their waste.
Thanks for your attention