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PanAfGeo Project: Environmental management of mines

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PanAfGeo “Geological knowledge and skills in African Geological Surveys” is a Pan-African project designed by EuroGeoSurveys (EGS) and the Organisation of African Geological Surveys (OAGS) with the support of several partners i.e. European Commission and African Union Commission. A feasibility study was launched 2013 aimed at proposing a pan-African project to strengthen the capacity of OAGS members as well as the OAGS organisation itself. This study was conducted under the leadership of EGS jointly with OAGS.

The world’s growing demand for raw materials has led to an increasing interest in the exploitation of mineral resources on the African continent. For developing nations struggling against poverty, the disadvantages of mining may outweigh the advantages, due to issues with institutional stability, economic management and overall management of the sector itself. Without doubt, mining has a significant, and quite often severe, impact on the surroundings. Local communities often suffer from the detrimental effects of contamination arising from mining, and when the European Union turns to Africa for its supply of raw materials, mining’s environmental impacts ought to be of great concern. The environmental impacts of mining and mineral processing often include air pollution, soil contamination, water pollution and siltation, geotechnical hazards, dam safety, land degradation and more. Many of these impacts have relevance to geosciences, and adequate handling of mining-related environmental problems often requires the help of skilled people with knowledge in geology, geohydrology and geochemistry.

The specific objective of this component of the PanAfGeo project is increased awareness and knowledge among the staff of African Geological Survey organisations on how geosciences can be used to understand, evaluate, predict and prevent negative impacts caused by mining activities followed by established advice to responsible authorities in:

- (1) acid rock drainage prediction and prevention;
- (2) radiation hazards of radioactive waste;
- (3) use of cyanide in gold extraction;
- (4) mine waste and mine water management;
- (5) methods for mine closure;
- (6) environmental monitoring of mines.

The questionnaires in the pre-study show that knowledge on how mining and quarrying effects the environment is low for some African Geological Surveys. Almost half of the surveys that have participated state that they do not know about environmental problems associated with mining in their country. The other half reports that mining operations in their country mainly lead to release of toxic substances (to both air and water) and health issues for the surrounding population. Geotechnical stability problems such as dam failure and erosion are also frequent, as well as biodiversity and spillage of acid drainage waters.

Specific recommendations are to:

- (1) increase the capacity to perform geochemical mapping and apply it for environmental assessments;
- (2) build capacity in subjects such as hydrogeology, mine water geochemistry and mine waste management;
- (3) strengthen the cooperation with responsible environmental and mining authorities;
- (4) assist responsible authorities in improving the quality of Environmental Impact Assessments and Management Plans.

