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MODELLING THE IMPACT OF PANASQUEIRA MINE ON THE ECOSYSTEMS AND HUMAN HEALTH: A MULTIDISCIPLINARY APPROACH**Candeias, C.¹, Ferreira da Silva, E.¹, Salgueiro, A.R.¹, Ávila, P.F.², Coelho, P.³, Teixeira, J.P.³**

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Mining despite being vital for the national economy is one of the most dangerous industries, both in terms of environmental and occupational health. This activity has problems associated not only by short term damage but also by long term impacts, such as the existence of huge volumes of toxic wastes that affect soils, sediments and waters. Those, therefore, encompass impacts on the health of the surrounding populations by direct or indirect exposure through the food chain, dusts and superficial and/or ground waters.

This study developed on the context of Medical Geology employs the source-pathway-receptor approach and aims to assess human health problems emerging from the contamination of soils, sediments, waters, dusts and plants on the vicinity of Panasqueira mine area (Sn-W). This mine, labouring since the beginning of the XX Century, is responsible for a huge volume of wastes deposited in tailings and dams. The exposure of those materials to the atmospheric conditions for long periods of time resulted in their weathering. As disclosed in previous studies the percolation of rain waters through the tailings materials forms acid mine drainage which contaminates the local streams sediments, waters and soils in the vicinity of Aldeia de S. Francisco de Assis. Also this contamination could affect the Zêzere River who feeds the Castelo de Bode dam (the main water supply of Lisbon).

The geochemical characterization carried out by the University of Aveiro (UA) will combine the geochemical results with geostatistical tools and epidemiological models in order to establish a link between contamination inputs and their consequences on human health. From an human health point of view, preliminary studies were carried out by INSA - Instituto Nacional de Saúde Dr. Ricardo Jorge (Porto). Urine and blood sample analysis already performed to a restrict number of persons revealed abnormal levels of metals and highlighted the need of further studies. In parallel a characterization of the local populations through a series of questionnaires will provide additional information about the natural and anthropogenic factors that might affect their health.

The combination of environmental and human biomonitoring studies may synergistically increase the knowledge about the bioavailability and bioaccessibility of toxic elements, which is essential to assess the potential risks to human health.

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