



## **Small-Scale Gold Mines in Andean region of Bolivia: Mercury in soils and plants from burning areas**

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Since historical times, mining activities have been one of the most important causes of environmental pollution in Bolivia. In the National Area of Apolobamba Integrated Management (ANMIN Apolobamba) there are many high elevation artisanal and small-scale gold mines (ASGM) where intense mining activities have been carried out, and the mercury is still being used in the amalgamation processes what involve the use of incineration facilities to vaporize Hg and further separation of Au from the amalgam. Facilities at these incinerators (or burning areas) range from crude open flame burners in the yard or inside the house of individual miners to a dedicated facility intended for use by group (or cooperative) of miners. The vaporized Hg is known to condense and settle on plant leaves, soils and water bodies and impact on the the main food sources - meats from llama, alpaca and sheep. We collected surface soil and plant samples and total Hg were determined. Mean contents of Hg in soils were between 0.5 and 48.6 mg Hg kg<sup>-1</sup> soil and were at least 5 to 60 times more compared to Hg in control sites, and exceeded the soil Hg threshold levels in some European countries. Also our data revealed that Hg in all plant samples have > 0.1 mg Hg kg<sup>-1</sup> plant limit for any desirable animal feed established by the European Community. The high level of plant Hg may elevate the bioaccumulation risk into the food chain because the camelids, that are entirely dependent on limited forage with high Hg, are the major providers of meat - the main food source for the miners in these high altitude areas. In addition, erosion of soils with high total Hg from many ASGM point sources is significant potential Hg contributor to the contamination of the lower reaches of the Amazon basin. In this overall context, the first actions could be aimed to organize and manage its proper practice, offering cleaner technical alternatives and making local people aware of mining contamination and its risks.