

## **Assessment of the environmental impact of an abandoned Pb-Zn mine on surrounding soil-crop system in Southwest China**

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Abandoned mining wastes are generally leading contributors to severe metal accumulation in surrounding soil and crop, these metals can pose hazards to human health due to their nondegradability and persistence in the environment as well as the potential to enter the food chain. In order to investigate how and to what extent the abandoned metal mines impact the surrounding soil-crop system, maize and corresponding soil samples were collected from an abandoned Pb-Zn mine in Southwest China and analyzed for heavy metal (Cd, Hg, Pb, As, Cu, Zn, Ni, Cr) total contents and chemical speciations.

The soils nearby the abandoned mines still contain high amounts of various heavy metals, 90.63%, 43.75% and 15.63% of samples with Cd, Pb and As concentrations exceeded the China risk control values, respectively, suggesting a high risk to agricultural production and human health. The chemical speciations of heavy metals indicated that metals Cd and Pb were mainly bounded to non-residual fractions while As, Hg and Zn were associated with residual fraction. All maize grain samples in the study area had relatively low heavy metal (except Pb) concentrations. As for Pb, five samples (approximately 16%) surpassed the national guidance limit for foods (CFDA, 2017), suggested that long-term consumption of these Pb over standard food may pose risks and hazards to local people nearby the abandoned Pb-Zn mine[1]. Hence, efficient managerial strategies should be adopted to protect food safety and human health.

[1] Bi, X., Feng, X., Yang, Y., Qiu, G., Li, G., Li, F., Liu, T., Fu, Z., Jin, Z., 2006. Environmental contamination of heavy metals from zinc smelting areas in Hezhang County, western Guizhou, China. *Environment international* 32, 883-890.