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Clean artisanal gold mining: a utopian approach?

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Abstract

Artisanal and small-scale mining (ASM) provides an important source of livelihood for rural communities throughout the world. These activities are frequently accompanied by extensive environmental degradation and deplorable socio-economic conditions, both during operations and well after mining activities have ceased. As gold is easily sold and not influenced by the instability of local governments, it is the main mineral extracted by artisanal miners. Mercury (Hg) amalgamation is the preferred gold recovery method employed by artisanal gold miners and its misuse can result in serious health hazards for miners involved in gold extraction, as well as for surrounding community inhabitants, who may be exposed to mercury via the food chain. The rudimentary techniques characteristic of ASM result in a number of occupational hazards, other although most risks are primarily attributed to machinery accidents and ground failure, such as landslides and shaft collapses.

Several technologies and methods commonly utilized by large-scale mining operations

can be downsized to smaller scale operations. However, the likelihood that miners will adopt these large-scale methods, or those developed specifically for ASM, depends upon some key factors. For an artisanal miner, these factors include: (1) increased or comparable simplicity, (2) quick recovery of the economic mineral, and (3) demonstrated financial gain. Other practical aspects, such as the availability of materials (chemicals, steel rods, piping, generators, etc), capital and operating cost requirements and access to technical support, also influence acceptance of new techniques.

This article will review four inter-related areas: first, the limitations and benefits, for ASM, of a number of specific technologies; second, the role of Processing Centers in education, information dissemination and provision of â€œcleanâ€ services; third, benefits and challenges associated with formalization of ASM activities; and fourth, the contribution of ASM to the development of sustainability of communities, primarily through diversification of livelihoods. The appropriate application of technologies, particularly given the diversity of ASM communities around the world, will also be explored.

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Keywords

Artisanal mining; Small-scale mining; Mercury pollution; Mineral processing; Clean technologies; Processing centers

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