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Numerical Modeling of Artisanal and Small Scale Mining of Coltan in the African Great Lakes Region

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Abstract : Coltan Artisanal and Small-Scale Mining (ASM) production from Africa's Great Lakes region has previously been addressed at large scales, notably from regional to country levels. The current findings address the unresolved issue of a production model of ASM of coltan ore by an average Democratic Republic of Congo (DRC) mineworker, which can be used as a reference for a similar characterization of the daily labor of counterparts from other countries in the region. To that end, the Fundamental Equation of Mineral Production has been applied, considering a miner's average daily output of coltan, estimated in the base of gross statistical data gathered from reputable sources. Results indicate daily yields of individual miners in the order of 300 g of coltan ore, with hourly peaks of production in the range of 30 to 40 g of the mineral. Yields are expected to be in the order of 5 g or less during the least productive hours. These outputs are expected to be achieved during the halves of the eight to ten hours of daily working sessions that these artisanal laborers can attend during the mining season.

Keywords : coltan, mineral production, production to reserve ratio, artisanal mining, small-scale mining, ASM, human work, Great Lakes region, Democratic Republic of Congo
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