Artisanal and small-scale mining in Africa: Occupational health and safety challenges

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INTRODUCTION

Artisanal and small-scale mining (ASM) is defined by the World Bank as mining carried out by individuals, families, groups, or cooperatives, using minimal mechanisation and labour-intensive methods.[1] The International Labour Organization characterises the sector in similar terms: low capital investment, labour-intensive extraction, limited technology, informal employment, and generally poor occupational health and safety (OHS) practices.[2] Artisanal and small-scale mining is predominantly a poverty-driven trade with a multiplicity of hazards.[3] Although often associated with rudimentary tools and informal arrangements, ASM is far from marginal – it is a major source of livelihood across the developing world, and nowhere more so than in Africa.[4]

SCALE OF THE SECTOR

Globally, an estimated 45–50 million people work directly in ASM, while more than 150 million people depend on ASM-related livelihoods.[4] The activity spans over 80 countries and accounts for roughly one-fifth of the world's gold production, alongside significant shares of cobalt, diamonds, tin, tantalum, tungsten, and gemstones.[4] Africa hosts one of the largest ASM populations in the world, with an estimated 10–15 million direct workers and 70–90 million dependants relying on the sector.[4] Women make up 30–50% of the workforce, and an estimated 1–2 million children are involved.[4] Most workers are aged 18–45 years, have predominantly primary-level education, and work within the informal economy.[3,5]

DISTRIBUTION ACROSS THE CONTINENT

Artisanal and small-scale mining activity and its associated workforce vary considerably by country.[4] Gold is a major focus of ASM across Ghana, Zimbabwe, Tanzania, Sudan, and the Democratic Republic of the Congo, while other important commodities include chrome, tanzanite, diamonds, cobalt, tin, tantalum, tungsten, gemstones, lithium, and manganese.[4] Artisanal and small-scale mining is driven largely by poverty, unemployment, and dependence on rural livelihoods, with high mineral prices and climate-related pressures on agriculture providing additional incentives.[3,6]

OCCUPATIONAL HEALTH AND SAFETY RISKS

Occupational health and safety is a central concern in ASM because of the informal nature of the work, weak regulatory oversight, unsafe mining methods, inadequate personal protective equipment (PPE), limited access to occupational health services, poor health surveillance, exposure to hazardous chemicals, and a general lack of safety training.[2,4] These conditions give rise to hazards across several categories.[2]

Prof. Dingani Moyo *Photograph: Prof. Dingani Moyo*

Dingani Moyo qualified as a medical doctor in 1994. He recently received two international awards in Manchester, UK for his outstanding contribution to the global development of occupational health and outstanding contribution to occupational health research. He has worked for ZIMASCO Pvt Ltd, DEBSWANA Diamond Mining Company, Tati Nickel Mining Company (Botswana), Botswana Metal Refinery, and Sino Zimbabwe Cement Company, among others. He has led regional multi-country occupational health and safety projects in southern Africa under the Global Fund, World Bank, United States Agency for International Development (USAID), African Union, and International Commission on Occupational Health. He has been an executive committee member of the American College of Occupational and Environmental Medicine, the South African Society of Occupational Medicine, and the International Commission on Occupational Health.

These exposures translate into a heavy health and safety burden: high injury rates, a range of occupational diseases, premature mortality, environmental degradation, reduced productivity and, ultimately, the perpetuation of poverty.[2,4] Notable examples include neurotoxicity from mercury exposure (used widely in artisanal gold processing), musculoskeletal disorders from ergonomic strain, and the health effects of chronic silica dust inhalation.[2,7] In southern Africa in particular, silicosis, HIV, and tuberculosis interact as a mutually reinforcing 'triple epidemic' among miners, compounding individual and population-level health risk.[2]

CONCLUSION

Artisanal and small-scale mining underpins the livelihoods of tens of millions of people across Africa, yet it remains one of the least regulated and most hazardous informal sectors on the continent.[3,4] The OHS picture described here – inadequate PPE, limited occupational health services, poor health surveillance, and significant chemical, biological, ergonomic, and psychosocial hazards – points to a sector in need of sustained attention.[2,4] Sustained, evidence-based interventions are needed to improve OHS while protecting the livelihoods of communities that depend on ASM.[4,8]

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