

Impact of Gold Mining on Crop Production, Livelihood and Environmental Sustainability in West Africa in the Context of Water-Energy-Food Nexus

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Abstract : The Volta River Basin (VRB) is a transboundary resource shared by Six (6) the West African States. It's utilization spans across irrigation, hydropower generation, domestic/household water use, transportation, industrial processing, among others. Simultaneously, mineral resources such as gold are mined within the VRB catchment. Typically, the extraction/mining operation is earth-surface excavation; known as Artisanal and Small-scale mining. We developed a conceptual framework in the context of Water-Energy-Food (WEF) Nexus to delineate the trade-offs and synergies between the mineral extractive operation's impact on Agricultural systems, specifically, cereal crops (e.g. Maize, Millet, and Rice) and the environment (water and soil quality, deforestation, etc.) on the VRB. Thus, the study examined the trade-offs and synergies through the WEF nexus lens to explore the extent of an eventual overarching mining preference for gold exploration with high economic returns as opposed to the presumably low yearly harvest and household income from food crops production to inform intervention prioritization. Field survey (household, expert, and stakeholder consultation), bibliometric analysis/literature review, scenario, and simulation models, including land-use land cover (LULC) analyses, were conducted. The selected study area(s) in Ghana was the location where the mineral extractive operation's presence and impact are widespread co-exist with the Agricultural systems. Overall, the study proposes mechanisms of the virtuous cycle through FEW Nexus instead of the presumably existing vicious cycle to inform decision making and policy implementation.

Keywords : agriculture, environmental sustainability, gold Mining, synergies, trade-off, water-energy-food nexus

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