

**GEOLOGICAL CONTROLS ON ENVIRONMENTAL PROBLEMS OF DEVELOPING
COUNTRIES OF THE HUMID TROPICS**

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Developing nations are not scattered haphazardly across the earth's surface but are concentrated mostly in the hot, humid tropics where the land is covered with heavily leached soils. The region's climate and the mineralogic composition of the near-surface rock materials are key elements of the environmental framework of developing nations. A host of problems related to soil fertility, food production, agricultural practices, man and animal nutrition, deforestation, water quality, public health, and erosion, are directly related to this region's geologic weathering environment. The common clay minerals of soils of the humid tropics are rich in aluminum, silica and iron and thus are poor for producing high-protein food. Slash-and-burn agriculture relies on ashes of the burned forest for soil nutrients. The soil's low ion exchange capacity results in the loss of most nutrients to runoff during heavy rains, accelerating eutrophication of surrounding waters. Lack of forest cover promotes erosion and siltation. Food needs for rapidly growing populations has resulted in shorter periods for forest regrowth between burnings. Consequently, soil deterioration increases rapidly while food production decreases. The common assumption that most of these nations can "Pull themselves up by their bootstraps" seems unlikely in light of the mineralogical and geological controls of their environment.