

Africa 2100 demographic and climatic trends; a geohydrological challenge

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Inspired by the Panta Rhei approach, a lecture about demographic trends in Africa, held januari at UNESCO-IHE Delft, resulted in the ambition to combine these trends with climatic trends to discuss overall implications for African geohydrology.

Africa is the last continent with a population explosion prognosis till 2100. The outlines of the demographic development from 2030 to 2100 can grossly be predicted now, although continued research remains necessary, for instance about so far unexplained fast declines of birth rates in South-Africa. The overall demographic trend implicates migration towards cities and the coast, multiplying pressures on water and land for housing, food production, infrastructure et cetera.

Firstly education in applied geosciences for a relatively very young population needs to be amplified in unconventional digital ways; an ameliorated, local up to national societal expertise, from politicians, civil servants, journalists to farmers, is a prerequisite to counteract food shortages or malnutrition and land degradation. It seems the only way to prevent further deterioration of living circumstances and unemployment and the destructive social tensions resulting from it.

Fortunately, in African geosciences there is a fast growing number of reliable and useful public domain reports and maps. Knowledge about surface and groundwater resources (e.g. UNEP, IGRAC) and climatic trends (e.g. IPCC) will form the firm basis for an evidence based geohydrological policy.

These datasets can be combined with increasingly sophisticated remote sensing information and processing; the paper will elaborate on improved soil moisture inventarisations (e.g. Vandersat).

These rapidly expanding data sets create the multidisciplinary toolkit to meet the challenges that face Africa coming crucial Anthropocene decades.

From an African continental perspective most geohydrological challenges need a transboundary, interdisciplinary approach, based on regional to global cooperation. Sea level rise and changing weather patterns in addition to demographic shifts will have huge impact on town design, hydrological and other infrastructure, nourishment, pollution, agrohydrology, forestry, animal husbandry and wild life. According to the authors, especially the continental interior should be hydrologically reinforced, with emphasis on seasonally optimal storage and availability of surface water, ground water and soil moisture.

Application of nowadays partly futuristic technologies on desalination and intracontinental water transport by renewable energy sources (solar, wind, geothermal, hydropower, tidal and fresh/salt-reverse-osmosis) must be pursued.

All geohydrological reinforcements of climatic landscape resiliency should be in concordance with African landscape cultural history and public consensus (traditional and/or democratic). The paper tries to contribute to a long term strategy of coordinated action programmes to fulfill the urgent basic needs of its inhabitants, eventually aiming at a globally justified well-being for all creatures.