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Representative meat consumption pathways for sub-Saharan Africa and their local and global energy and environmental implications

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In sub-Saharan Africa (SSA) most people live on plant-dominated diets, with significantly lower levels of per-capita meat consumption than in any other region. Yet, economic development has nearly everywhere spurred a shift to dietary regimes with a greater consumption of meat, albeit with regional heterogeneity for meat-type and magnitude. A growing regional economy, changing cultural attitudes, and a steeply increasing population could thus push the regional demand upward in the coming decades, with significant depletion of regional and global natural resources and environmental repercussions. We study the historical association of the four main meat types with demand drivers in recently developed countries via seemingly unrelated regression (SUR) equation systems. Using the calibrated coefficients, trajectories of meat consumption in SSA to 2050 are projected relying on the SSP scenarios over GDP and population growth. Then, using a Leontiefian environmentally extended input-output (EEIO) framework exploiting the EXIOBASE3 database, we estimate the related energy, land, and water requirements, and the implied greenhouse gas (CO₂, CH₄, N₂O) emissions. We calculate that if production to meet those consumption levels takes place in the continent – compared to the current situation – global greenhouse gas (GHG) emissions would grow by 230 Mt CO₂e (4.4% of today's global agriculture-related emissions), the land required for cropping and grazing would require additional 4.2 · 10⁶ km² (more than half of the total arable land in SSA), total blue water consumption would rise by 10,300 Mm³ (0.89% of the global total), and additional 1.2 EJ of energy (6% of today's total primary energy demand in the region) would be required. Alternative scenarios where SSA is a net importer of final meat products are reported for comparison. The local policy and attitudes towards farming practices and dietary choices will have significant impact on both the regional environment and global GHG emissions.

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