

Land-use and land-cover dynamics in East and the Horn of Africa: a regional synthesis of trends, drivers, impacts and interconnected transitions

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ABSTRACT

Land-use and land-cover (LULC) change has become one of the most significant drivers of climate change and environmental transformation globally. In East and the Horn of Africa, several factors have accelerated landscape transformation, yet evidence on regional patterns, underlying drivers, and associated impacts remains fragmented. In view of this, we synthesized a total of 56 existing studies aimed at generating evidence on LULC dynamics across East and the Horn of Africa. Specifically, the review identified dominant land-cover transitions, drivers, impacts and emerging research gaps. The review employed a systematic literature review approach guided by the PRISMA 2020 framework. Peer-reviewed studies published between 1980 and 2024 were identified from multiple databases. Studies were screened using predefined inclusion and exclusion criteria. The findings revealed widespread landscape transformation characterized by forest and woodland decline, wetland degradation, grassland conversion, agricultural expansion, and increasing built-up areas. Agricultural expansion emerged as the dominant proximate driver of LULC change, interacting with multiple underlying factors. The review further identified substantial methodological variation among studies. The review concludes that LULC dynamics in the EHoA are driven by interconnected social economic, institutional and environmental forces. The review recommends need for integrated regional approaches that combine sustainable land management processes that guarantee ecological restoration, livelihood realities and improved land-use governance.

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Introduction

Land-use and land-cover (LULC) change represents one of the most significant forms of global environmental and climate transformation, reflecting complex interactions between human activities and ecological processes (Foley et al., 2005; Meyfroidt et al., 2022; Verburg et al., 2013). Changes in land use and land cover influence ecosystem functioning, biodiversity conservation, carbon cycling, hydrological regulation, food production systems, and the provision of ecosystem services for climate modification essential for human well-being (Assede et al., 2023; Ketema et al., 2020). Over recent decades, anthropogenic factors including population growth, agricultural expansion, urbanization, infrastructure development have accelerated landscape transformation across many regions of the world (Lambin et al., 2001; Lambin & Meyfroidt, 2011). These changes have profound implications for climate systems, sustainable development, food security and rural livelihoods (Branca et al., 2013; Bununu et al., 2023; DeFries et al., 2010).

Globally, LULC trajectories vary considerably depending on socio-economic development pathways, governance systems, environmental and technological advancements. In tropical regions of the world (Africa, Asia, and Latin America), land-use change has predominantly been associated with the conversion of ecosystems into agricultural land, urban expansion and settlements due to increasing demand for food, energy, and

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