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promoting climate resilient futures”

Climate resilience through sustainable rangeland management catalysed by effective early warning: Cross-border region within IGAD

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Abstract

Karamoja Cluster (Kenya–Uganda cross-border area, extending to Ethiopia and South Sudan) is a hotspot of climate-induced hazards including droughts, rangeland degradation and resource conflicts affecting pastoral and agro-pastoral communities. The BMZ-funded SCIDA III project (Strengthening IGAD’s Capacity to Increase Drought Resilience in the Horn of Africa) implemented by GIZ strengthens IGAD’s regional role through transhumance development plans and cross-border resilience measures.

This contribution demonstrates how Earth Observation (EO) technologies are applied to support sustainable rangeland management (Thematic Area 1), climate-change adaptation and mitigation (Thematic Area 2), and technology/data/knowledge systems (Thematic Area 6). Using multi-sensor satellite data (vegetation indices, soil moisture, land-cover change) from the East Africa Drought Watch platform, combined with participatory ground-truthing and indigenous knowledge, the project characterised and mapped transboundary rangelands, identified grazing capacities, and quantified degradation hotspots.

A tailored multi-hazard early warning system was co-developed for the Karamoja Cluster, integrating EO-derived drought risk profiles, seasonal forecasts, and community indicators into actionable cross-border bulletins. These tools inform timely livestock mobility decisions, early destocking alerts and nature-based restoration planning under the Transhumance Development Plan. Cognizant that most early warning systems usually do not reach the intended beneficiaries in hard to reach areas and in the appropriate medium (localised language), SCIDA III has supported in ensuring the effectiveness of early warning system is implemented within the Karamoja cluster through a multi-layered information management system called Husika.

Results show improved rangeland monitoring accuracy (>85 % agreement with field data), earlier drought detection (up to 4–6 weeks lead time), and enhanced cross-border coordination among IGAD member states. Women and youth pastoralists reported higher preparedness and reduced livestock losses during the 2023–2025 dry seasons.

The SCIDA III approach proves that EO-driven, participatory systems, can transform vulnerability into resilience in dryland agro-ecosystems. Scalable lessons for other IGAD clusters and tropical rangelands are discussed.

Keywords: Drought resilience, earth observation, IGAD, Karamoja cluster, multi-hazard early warning, rangeland management, remote sensing, transhumance

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