Tropentag, September 11-13, 2024, hybrid conference

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Advancing cattle genetics: A comparative exploration of innovation systems in Kenya and Uganda

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Abstract

Enhancing livestock production, disease resistance, and environmental resilience in developing countries is pivotal to meeting the increasing demand for animal-based foods amid urbanisation, rising incomes, and climate change impacts. Livestock development in developing countries is characterised by a complex interplay of challenges including limited access to resources, inadequate infrastructure, and the need for sustainable practices to meet growing demands for food security and economic growth. Improving livestock breeds is a key strategy to bolster productivity and resilience. This study employed the Functional-structural analysis within the Agricultural Innovation Systems framework to conduct a comparative examination of the evolution, current status, key actors, challenges, opportunities, and critical complementary activities within the cattle genetic innovation systems of Kenya and Uganda. The current state of cattle genetics in Uganda and Kenya is marked by ongoing efforts to improve breeding initiatives, despite variations in progress and infrastructure between the two countries. Data collection methods included document reviews, expert interviews, focus group discussions, and net-maps. Findings indicate the initiation of genetic improvement initiatives in the early 20^{th} century in Kenya and the mid-20^{th} century in Uganda and show that, to date, there is substantial public sector involvement in the cattle genetics sector. Common challenges across both countries include limited farmer knowledge, inadequately regulated genetics policies, stakeholder collaboration constraints, and technical capacity limitations. The other major challenges faced in Kenya are a focus on high-potential areas (highland areas) and the dairy sector. Similarly, Uganda grapples with expensive resource limitations and weak national breeding programs. Identified critical complementary activities encompass nutrition and pasture management, animal housing and general care, and veterinary care services. The study recommends increasing investment and funding for the cattle genetics sector and services, streamlining policy reform and implementation, fostering stakeholder collaboration, strengthening farmer education, promoting cultural sensitivity and awareness, and increasing investment and engagement in complementary activities. These insights help identify crucial areas for genetic improvement within cattle genetic innovation systems in Kenya and Uganda, with potential applicability to countries sharing similar socio-economic factors.

Keywords: Agricultural innovation systems, cattle genetics, comparative study, functional-structural analysis, Kenya, Uganda

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