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Scaling sustainable livestock: Adoption and impacts of *Urochloa* hybrids in Latin America (2001–2024)

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Abstract

Sustainable intensification of cattle systems is essential to meet the growing demand for animal-sourced foods while reducing environmental impacts in tropical regions. This study assesses the adoption and multi-dimensional impacts of interspecific *Urochloa* (syn. *Brachiaria*) hybrids across 27 countries in Latin America and the Caribbean (LAC) over the period 2001–2024. Using an innovative mixed methodology, we quantify adoption patterns and evaluate social, economic, and environmental outcomes. Results indicate that *Urochloa* hybrids have been adopted by approximately 1.2 million farmers on 1.9 million hectares, benefiting nearly 9 million people across the region. Adoption is strongly driven by smallholders, who represent about two-thirds of adopters, and generates significant rural employment beyond farm households. Despite rapid growth, adoption remains highly concentrated geographically and represents only a small fraction of total grassland area, highlighting substantial untapped potential. Economically, the hybrids are projected to generate cumulative forage value of US\$9.2–12.2 billion by 2033, reflecting increased forage productivity and cattle performance. Environmental analysis suggests that adoption significantly reduced greenhouse gas emissions – by an estimated 16 to 146 Mt CO₂-eq – and could have potentially spared up to 5.5 million hectares of land, particularly when integrated into silvopastoral systems. These findings underscore the role of improved forages as a key lever for climate mitigation and land-use efficiency in the cattle sector. However, widespread adoption is constrained by systemic barriers, including limited access to quality seed, weak seed systems, insufficient extension services, and policy and regulatory challenges. Addressing these constraints will require coordinated investments in seed supply chains, inclusive financing mechanisms, knowledge dissemination, and supportive policy frameworks. Overall, this study demonstrates that *Urochloa* hybrids offer a scalable, science-based solution to enhance productivity, resilience, and sustainability in tropical cattle systems. Scaling their adoption could play a critical role in aligning cattle development with climate goals, food security, and rural development objectives in LAC and beyond.

Keywords: Greenhouse gas mitigation, impact assessment, improved forages, seed systems, sustainable intensification, technology adoption