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Mapping the Suitability of Tropical Forages – Now and in the Future

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Abstract

Livestock makes multiple contributions to the economic and social wellbeing of more than a billion livestock keepers across the globe: it provides income and highly nutritious food, it plays an important social role and is an asset for financial insurance. It also contributes to environmental resilience and sustainability through providing soil health and energy and in some cases protecting biodiversity. Key environmental footprints of concern, however, include nutrient loads, food-feed competition, GHG emissions, water use, and land-use conversion. Due to rising demand for livestock products, livestock's pressure on land and other resources continues to grow. It is thus imperative for the livestock sector to support a process of sustainable intensification. Improved forages and feeding strategies have been identified as one of the most promising entry-points for simultaneously enhancing livestock productivity and eco-efficiency.

In the face of climate change and its expected negative impacts on livestock systems, adaptation and increasing the resilience of livestock production systems should equally be a priority. Regions identified as the most vulnerable to climate change, such as Sub-Saharan Africa and South Asia, are also regions where farmers and rural communities rely the most on livestock for food, income and livelihoods, and where livestock is expected to contribute increasingly to food security and better nutrition. Arguably the most important climate change impacts are those mediated through the climate's impact on what the animals eat.

This paper describes the application of a suitability mapping tool to the case of tropical forages. The GIS tool is web-based, well documented and easy to use. It is packaged together with a spatial database and ideal for use by students, educators and development practitioners. Suitability maps for a wide array of tropical forages were produced, using both current and potential future climate conditions. Smallholder dairy farmers in Kenya, Tanzania, Rwanda and Ethiopia used these maps for selecting context-specific no-regret forage species and varieties. The maps also point to the gaps and opportunities for improving and expanding the choice of adapted forage options. This can, finally, be translated into breeding objectives for forage breeding programs.

Keywords: Eco-efficiency, forages, GIS, suitability

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