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"Management of land use systems for enhanced food security: conflicts, controversies and resolutions"

Potential of African Indigenous Vegetables to Contribute to Climate-Smart Food Systems

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Abstract

Kenya has committed to reduce greenhouse gas (GHG) emissions from all sectors including agriculture being the major source accounting for about 34.6 % as outlined in the Kenya National Climate Change Action Plan of 2013–2017. This is in recognition to the serious threats posed by climate change on the country's efforts to alleviate poverty, achieve food security for all and enhance sustainable development. However, Kenya's growing population coupled with urbanisation have the potential to increase GHG emissions due to increasing demand for food and changing dietary patterns. Consequently, there is a need for the Kenyan government to promote high nutrition sensitive agricultural value chains in order to sustainably feed the growing population with low carbon food. African Indigenous Vegetables (AIVs) provide an opportunity to realise this climate-smart agricultural (CSA) development pathway. They are more profitable, adaptable to local climate variability, productive under low input systems and more popular among the growing number of urban dwellers in Kenya when compared to exotic vegetables. All arguments fit well to the three principles of CSA of sustainably increasing agricultural productivity and income, adapting and building resilience to climate change and GHG reduction. However, there is little data on GHG emissions and carbon footprints (CF) in AIVs smallholder production systems. Therefore, the first objective of this contribution is to fill this knowledge gap by showing results from existing literature on GHG emissions from African horticultural systems. Secondly, a comprehensive field research methodology on the measurement of on-farm N_2O fluxes using static chambers systems in smallholder AIV production systems will be presented. Lastly an estimation of CF per unit product of vitamin A, iron and protein per unit product of AIVs compared with exotic vegetables using Cool Farm Tool will be shown. This tool integrates several empirical models mainly derived from IPCC default values in a GHG calculator. The default values will be replaced by input parameters derived from activity data collected at farm level. The methods are essential for assessing current hotspots of GHG emissions in AIV smallholder practices and showing potentials for mitigation.

Keywords: African indigenous vegetables, carbon footprint, climate-smart agriculture, greenhouse gas emission

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