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The effects of economic and environmental strategies on typical dairy farms performance in Western Kenya

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Abstract

Dairy farming makes a substantial contribution to economic and social development. Globally, milk production employs around 150 million people. The dairy industry, predominantly smallholder in East Africa, is the most developed of the livestock sub-sectors. Increased demand for animal-source food might support smallholder crop-livestock farmers in engaging in market-oriented economic activities by expanding livestock production practices. But it also significantly contributes to global warming contributing about 30 % of the greenhouse gas emissions in the country. and expected production growth will come along with increasing emissions. The study region is Western Kenya. This region's rainfall is bimodal, with long rains from March to June and short rains from September to December. As a result, each year has two full cropping seasons. The majority of farms are mixed crop-livestock farms, with a focus of the main economic activities on sugarcane, corn, sorghum and dairy. Rainfall, on the other hand, is exceedingly variable and unpredictable, resulting in crop losses and food insecurity. Based on a farm survey among 160 mixed dairy farms in the four counties Vihiga, Siaya, Kakamega and Homabay typical farm data sets are set up for the purpose of determining the effects of greenhouse gas mitigation on typical dairy farms performance. These data sets include the herd structure, the animal performance, feeding strategies and land use. The criteria of selecting typical farms is based on: number of dairy cows, animal production systems, breed and crop production. Greenhouse gas emissions estimation for the dairy enterprise and related crop and forage production will be applying IPCC methodology tier 2 following 2019 IPCC guidelines. The ongoing study aims at assessing the effects of greenhouse gas mitigation strategies on herd performance, farm economics and greenhouse gas emissions. The results will be able to inform stakeholders on potential side effects and co-benefits of the mitigation strategies. The study will also contribute to a flagship project of the global research alliance on agricultural greenhouse gases (GRA) called Economics of GHG mitigation at farm level in global cattle production systems.

Keywords: Climate change, dairy farms, greenhouse gas emissions