Assessing low-carbon livestock technologies in Costa Rica:

Business case analysis of low-carbon livestock production

Executive Summary

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This summary presents the results of an analysis undertaken to model and assess the viability of sustainable practices for the livestock sector outlined in Costa Rica´s Low Carbon Livestock Strategy and NAMA.

Background – addressing the climate performance while increasing the productivity of the livestock sector in Costa Rica

Livestock is one of the traditional productive activities of Costa Rica. The sector is the third-largest source of GHG emissions in the country, making up around 10.3% of total emissions. Despite this, productivity is relatively low (average animal density of 1.2 AU/ha).

To address this, the government has adopted policy instruments (a Low Carbon Livestock Strategy and a NAMA) that aim to promote a more sustainable climate-smart sector. These instruments foster the adoption of practices and technologies that increase farmer productivity, reduce carbon emissions, and increase their resilience to climate change. A key subset of these practices includes: rational grazing, hedgerows, improved pastures and set-asides for increasing forest cover.

Modelling the performance of sustainable practices

The analysis carried out modelled the potential outcomes from the adoption of these practices on four farms in the country. The four farms selected for this analysis had different levels of management practices and were at different stages of the transition to a climate-smart system. The farms cannot be consired representative of all the farms in the country, but are located in the country's main producing regions, therefore can provide an important opportunity to explore the scope and potential impacts of the proposed technologies in various scenarios.

For the development of the analysis, business as usual and improved/climate smart scenarios for each of the four farms were developed using a stochastic model, with the aim of assessing the costs and benefits accrued to producers from the implementation of climate-smart technology adoption in different contexts. The improved secenario was built based on the technology that best matched the baseline situation and production system on each of the farms and the plausibility of the technologies being adopted by the producers.

The successful implementation of these strategies is assessed by whether they increase levels of productivity and income, reductions in the emissions intensity per unit produced, and in increased capture of GHG emissions, relative to the baseline.

Resutls from the analysis

A summary table with the results is included below. The results show that by adopting technologies and practices outlined in the NAMA, the farms could both increase their financial and climate performance. However, the impact of the adoption of these technologies was highly sensitive to the baseline characteristics of the farm. For instance, the results from the analysis show that impacts may be greater for dual-purpose farms as there are faster returns given the increase in dairy production.

Farm	Results
Dual Purpose Farm in Puerto Viejo de Sara-piqui	The results show that for the dual-purpose farm, increasing the use of improved pastures by 10% per year over a 3-year period, and the release of 10% of pastures for the regeneration of secondary forest resulted in benefits in all variables measured. Emission intensity rates were significantly reduced, and producer cash flows were shown to improve.
Dual purpose farm in Cañas, Guanacaste	The results show that increasing the area dedicated to fodder raises the productivity of the herd and improves the emission intensity per unit produced. This in turn increases profitability and cash flow for the producer.
Cow-Calf Farm - Las Juntas de Abangares, Guanacaste	The results show that introducing rational grazing and expanding the availability of fodder banks contributed to improvements in productivity, reductions in the emissions intensity per unit produced, and profitability.
Cow-calf farm in Cría de La Virgen de Sa-rapiquí, Heredia	The results show that by increasing the area under rotational grazing by 10 hec-tares and releasing 10% of pasture lands as set-asides for natural regeneration of forests, the farm sees an improvement in its carbon balance, cash-flows, and profitability.

The simulations carried out as part of this analysis also show that some technical parameters such as the calving rate, mortality rate (young and adult), daily weight gain for male and females, the Kg/milk/day, and the age at first birth – have a significant impact on the outcome associated with the adoption of a sustainability strategy. It is important that these parameters are identified when assessing the feasibility of implementing the technologies outlined in the NAMA.

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