

The Regional Universities Forum for Capacity Building in Agriculture with support from the Global Research Alliance on Agricultural Greenhouse Gases have funded eight Graduate Research Grants (GRG) aimed at building the capability of graduate and post-graduate level students in Africa to conduct applied research on agricultural greenhouse gases. Each GRA-GRG supports a Principal Investigator (an individual senior lecturer of a RUFORUM member university) and two Masters Students to undertake research and training on topics related to the measurement and management of greenhouse gas emissions and removals in ruminant farming systems in Sub-Saharan Africa over a two-year period.

Project Coordinator
Maseno University, Kenya

Project ID: RU/2020/
GRG/02

Project duration:
24 months

Start date
16th November 2020

Funding
RUFORUM

Total budget:
US\$70,040.00

Project partners:
County Government of
Busia – Department of
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and Fisheries, County
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County Government
of Vihiga -Department
of Agriculture,
Livestock, Fisheries and

Project title

Capacity Building for Mitigation of GHG Emissions and Improved Ruminant Productivity through Efficient Feeding and Manure Management Strategies in Agro-Pastoral Systems

Summary

Improved livestock management practices offer solutions that increase farm productivity whilst mitigating greenhouse gas (GHG) emissions for realisation of food security and sustainable agricultural development. However, quantified estimates of GHG from practices that can feed into Kenya national greenhouse gas inventory are unavailable. Therefore, there is need to develop capacity to capture data on GHG emission to support formulation of relevant mitigation strategies from ruminant production systems. The hypothesis that provision of detailed Tier 2 data on feeding, animal performance and manure management practices will enhance quantification of emissions across diverse production systems compared to Tier 1 default values, will be tested. Action research using trans-disciplinary, participatory and whole-farm systems approaches in Busia, Kisumu and Vihiga counties of Kenya is envisaged to identify and develop sustainable farm-based productivity and GHG mitigation solutions. Data on three priority areas namely characterization of livestock feeding systems and practices, spatial-temporal availability and nutritional composition of feed resources and crop residue utilization, and manure management strategies in agro-pastoral production systems will be collected. It is envisaged that optimum utilization of available feed resources and low emission manure management strategies including biogas capture will enhance adoption of climate smart livestock production practices for increased productivity, incomes and environmental sustainability.

Objectives

Overall: To contribute to enhanced efficiency in ruminant productivity and mitigation of GHG emissions through capacity building for efficient feeding and manure management strategies in agro-pastoral systems

The specific objectives are to:

1. develop capacity for characterization of feeding systems and practices and their effects on animal behaviour, production and enteric methane emission.
2. develop capacity for the establishment of spatial-temporal variability and nutritional composition of livestock feed resources in relation to mobile livestock systems

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Te Kāwanatanga o Aotearoa



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<https://bit.ly/38OReSv>

3. develop capacity for assessment of effects of crop residues utilisation and livestock manure management strategies on GHG emissions and removal

General planned activities

1. Project management- Project inception, monitoring and evaluation and end of project review
2. Situation analysis to establish feeding systems and practices, feed resource utilisation and effluent management practices
3. Stakeholder fora - Stakeholder analysis of possible options for intervention strategy formulation
4. Case studies - Feed resources/manure sample analysis, Animal behaviour & performance evaluation trials and enteric methane estimations, Energy requirement determination based on livestock mobility, Substrate evaluation and GHG production evaluation
5. Farmer training- Ruminant feeding management and Ruminant system waste management
6. Communication and dissemination - Publicity (Project webpage and weblinks), brochures, newsletters, technical publications, theses, multiplication symposium

Students activities

- Student 1: Evaluate the effect of feeding practices on animal behavior, production and enteric methane emission.
- Student 2: Assess the effects of spatial-temporal and nutritional composition variation of feed resources on ruminants in mobile livestock systems.
- Student 3: Assess the effect of crop residue and effluent management strategies on GHG emissions and their removal.

Expected outcomes

1. Contribution towards national GHG inventory
2. Contribution towards national estimates of available fodder
3. Increased livestock productivity
4. Mitigation of GHG emissions
5. Socio-economic empowerment
6. Increased crop productivity
7. Adoption of green energy solutions and sustainable agricultural practices

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