

GLOBAL RESEARCH ALLIANCE

ON AGRICULTURAL GREENHOUSE GASES

International Livestock Research Institute Nairobi, Kenya



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Input to 2023 Livestock Research Group Meeting
Lyon, France

Relevant activities (1/2)

GHG Direct Emission Measurements

- Landscape in different land-use systems (EC towers & remote sensing with FloX)
- Animal (chambers)
- Manure, soil, and water (manual and automatic chambers)
- Farm-scale anaerobic digesters (fixed-dome and prefabricated biodigesters)

Carbon sequestration

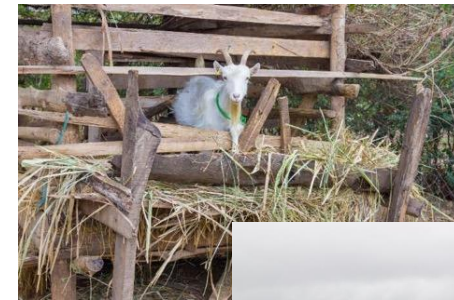
- Pasture restoration in humid systems (highlands)
- Soil carbon storage in & GHG emissions from different land-use systems



Relevant activities (2/2)

GHG Indirect Emission Measurements

- Activity data collection to define farm typologies and estimate enteric and manure emissions
- Economic farm data collection for MACC
- On-farm animal health data for estimating its effect on productivity and emissions
- On-farm data to estimate biogas and biofertilizer production and use, and their socio-economic, health, gender, and environmental co-benefits.

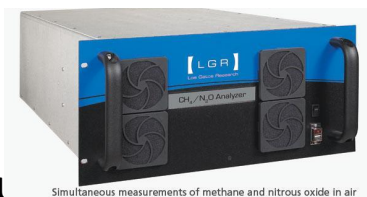


Laboratory Facilities

- GHG measurement lab



6 GCs



1 Los Gatos Research (LGR)
Analyzer (CH₄ and N₂O)



Bomb Calorimeter



Ankom



CN Analyzer



Microplate Reader

Future priorities

GHG Direct Emission Measurements

- Landscape scale in more land-use systems (EC towers)
- Animal (set-up of SF₆ and development of pixies for enteric methane emissions)
- In-vitro digestibility and methane mitigation assays
- Intervention testing to reduce animal and manure GHG emission (intensities)



Carbon sequestration and circular economy (biogas)

- Pasture restoration in dry lands and effects on soil carbon and biodiversity
- Improving MRV systems for soil carbon sequestration
- MRV for GHG emissions and emissions reductions for biogas sector
- Innovate biodigester technologies tailored to the energy needs of farms, various wastes and agro-ecologies



GHG Indirect Emission Measurements

- Validation of IPCC equations for African systems
- Standardized activity data collection (using ODK) and data analysis workflow
- Closer collaboration with CIAT (activity data), FAO (modelling) and national governments
- Evaluation of effects of on-farm interventions

Capability needs

GHG Direct Emission Measurements

- Animal (set-up of SF6)
- Manure (ammonia volatilization)
- Anaerobic biodigesters (on-farm and in-vitro)
- Rumen, biodigester and soil microbiology

Carbon sequestration and circular economy (biogas)

- Biodiversity of vegetation & invertebrates
- Scaling of GHG emissions and soil carbon models in different land-use systems & scenario testing (land conversion)
- Scaling up biodigesters investment through innovative technology, climate financing and public-private partnerships

GHG Indirect Emission Measurements

- MACC analyses
- Modelling (upscaling, mitigation potentials, biogeochemical processes, ...)

Capacity building

- Shared student supervision
- Student, scientist & lab technician exchange

