GLOBAL
RESEARCH
ALLIANCE

ON AGRICULTURAL GREENHOUSE GASES

Inventory Improvement (making it count) Flagship

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Components

1. Enhancing inventory **structure**

2. Building **Capability**

3. Acquisition and administration of **data**

4. Demonstrating **mitigation** in NDCs

1. 'Best practice' guidelines for incorporation of mitigation into national inventories.

• **Who?** *(Collaboration Process needed)* GRA Members, CGIAR-CCAFS, IPCC TFI and EFDB

• **What?** Develop guidance that identifies how to approach the incorporation of mitigation practices and technologies into agricultural GHG inventories

• **Why?** Practitioners will be assured that methods used to include mitigation practices or technologies in GHG inventories will be accepted to include.

• **How? Dedicated Coordinator + in-kind for:** develop guidance for a suite of indicative mitigation practices and technologies based on country experience.

How to Improve Inventory Methods

2. Guidance on inventory Tiers

a) **Developing guidance for good implementation of higher Tier methods in national inventories**

• **What?** Documents/series of documents for researchers and inventory practitioners familiar with **Tier 1** methods planning to move to **higher Tiers**.

b) **Developing guidance for good implementation of Tier 3 models in national inventories**

• **What?** Documents/series of documents for researchers and inventory practitioners familiar with **Tier 2** methods planning to move **to Tier 3**.

• **Who?** *(Collaboration Process needed)* GRA Members, CGIAR-CCAFS, FAO, IPCC, UNFCCC, IPCC TFI and EFDB

• **Why?** Internationally vetted sound practice is needed to enable countries to be better able to make decisions on how to implement higher Tier models. Reviewers will also be following the same guidance.

• **How? Dedicated Coordinators + in-kind for: :** Describe sound practice for moving to Higher Tiers. Make extensive use of case studies and examples of moving to higher Tiers including advice on activity data gap filling and selection of appropriate emission factors..

3. **Database and Inventory Refinement for GHG Emissions associated with Manure and Nitrogen (N) Management**

Who? *(Collaboration Process needed)* GRA countries, GRA partners, IPCC, FAO, Eurostat, TFRN, GRA-LRG Manure Management (MM) Network, RAMIRAN

What? Develop a central database of emission factors (CH4 and N emissions) for complete MM and N excretion chains associated with different livestock production systems.

Why? Allow countries using Tier 1 emission factors to upgrade inventories by using third party datasets from countries with similar production systems, soils and climate

How? Dedicated Coordinator + in-kind for: Develop database by collecting disaggregated emission data, emission factors and activity data. Statistical relationships between activity and GHG emissions will be determined providing information on climatic, management and other abiotic drivers

4. **Developing guidance for improving emissions from manure management (MM) in national inventories**

Who? *(Collaboration Process needed)* GRA Members, FAO, IPCC TFI and EFDB, GRA-LRG MM Network, RAMIRAN (European manure scientific network), Manure South (Latin American manure network), Latin American network of Inventory Compilers

What? Series of documents describing the key areas to be considered for the improvement, Database of information relevant to estimating MM emissions, scientific papers and scientific projects

Why? improve the estimation of CH4 and N2O emissions from MM, for different animal species and MM practices

How? Workshop and in-kind for: compile available information to improve the estimation of CH4 and N2O emissions from MM, for different animal species and MM practices.

Beef methane emissions and Identifying new data sharing opportunities

5. Towards a national livestock methane database project

Who? *(Collaboration Process needed)* INTA (National Institute of Agricultural Technology, Argentina). Inter-institutional Network of researchers in Greenhouse Gas (GHG) Emission from Livestock (REDGEI).

What? construction of a database template prototype for the beef cow-calf operation in flooding Pampas (expandable)

Why? Improve national inventories and explore regional mitigation options

How? System engineer to develop a Database template with the information from projects and individual experiments on ruminant nutrition and production systems.

6. Identifying emissions and mitigation options by mapping analogous production systems.

Who? *(Collaboration Process needed)* CSIRO, Wageningen University, U. Aberdeen, CG centres

What? Develop spatial dataset identifying emissions and mitigation options for different systems

Why? Reduces the cost of estimation; improve national inventories; develops capability; relevant to multiple countries; utilises and builds on existing resources; tangible product produced, contributes to other international processes (IPCC).

How? Dedicated Coordinator + in-kind for: Data analysed and identify areas where common emission factors or mitigation measures can be used. Extrapolation of emission data and mitigation options from one site to larger areas by identifying the spatial domain of major livestock, crop and paddy rice systems production systems globally**.**

West Africa Livestock Productivity and Emission Hub

7. Establishment of GHG measurement, mitigation, adaptation and inventory Centre in West Africa.

Who? *(Collaboration Process needed)* Department of Animal Science, Ghana

What? Regional teaching and training centre focused on enhancing animal productivity in the sub-region with minimal environmental carbon footprint

Why? Improve national inventories and monitoring, reporting and verification of emissions; develop capability; relevant to multiple countries; utilises and builds on existing resources

How? Centre to be established at the Department of Animal Science, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana. Centre ill carry out: training on GHG measurement; generate country specific data (Tier 2) for the West African sub-region; Mitigation and adaptation activities through forage development and animal breeding, provide training to scientists and policy makers on measurement, mitigation, adaptation and GHG inventory and GHG studies in Africa.

8. Quantification of GHG emissions from growing and fattening systems for beef production in sub-humid central area of Argentina

• **Who?** *(Collaboration Process needed)* INTA, IFASS, IPCVA

• **What?** Quantify GHG emissions from alternative beef production systems

• **Why?** To gather information from different systems for beef production, for regional and national decision-making. Develop local Ym values for national inventories and regional mitigation potential measurements. Evaluate potential impact of mitigation strategies

• **How?** Expansion of an existing project to increase animal numbers and conditions under investigation

9. Validation of SF6 tracer technique modified for longer collection period for grazing animals on extensive

management.

• **Who?** *(Collaboration Process needed)* INTA, IFASS, IPCVA

• **What?** Develop a system to measure methane emissions from cattle grazing in large rangelands

• **Why?** Determine local Ym values for cattle grazing in large rangelands

• **How? Coordinator (LEARN) for:** Modify the original SF6 method by using a different canister and airflow restrictor allowing an extended sample collection period (5 continuous days).

- Focus on synthesis of existing data and knowledge to improve its usefulness
  - Have useful products in 1-2 years,
  - Capability building for improvements to inventory structure, emission data, and reporting of mitigation activities
  - Initial funding requirements are relatively small
  - Coordinator to do organizational, data synthesis, and report development common requirement
  - *In-kind* contributions essential
  - Provide opportunities for involvement and benefits for all countries
  - Most projects will identify gaps that can be filled with further research
- Process to bring together collaborative project needed
  - No obvious funding source
  - Initial effort to organize project could be barrier that prevents its development
  - Need clear signal of support for a project to justify further development