

# GLOBAL RESEARCH ALLIANCE

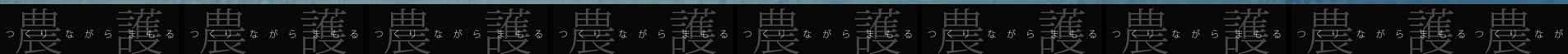
ON AGRICULTURAL GREENHOUSE GASES

## GRA Flagships

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# GRA Flagships – Strategic Plan 2016-2020



- GRA Council adopted its first Strategic Plan, which included as part of its priority actions:

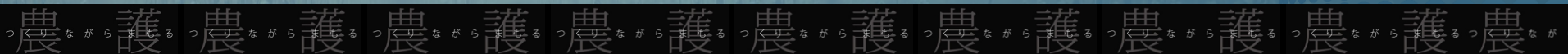
*“Identify possible GRA Flagship Research Projects for presentation to and review by the Council for potential adoption on an annual basis. ”*

- Flagships will make a major contribution to the GRA:
  - Reducing greenhouse gas emissions while supporting food security
  - Advancing global knowledge through collaboration
  - Supporting countries in their developing and implementing solutions
  - Promote synergies between mitigation and adaptation
- Flagships are thematic areas that will be advanced through specific actions and can include research, capacity building, guidance and transfer.
- Excellent opportunity to align Council members' domestic research programmes and Partner activity to the Flagships and to utilise upcoming research calls, both of the GRA and of GRA Partners

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- GRA Council endorsed development of four GRA Flagships:
    - Enteric Fermentation
    - Agricultural GHG Inventories
    - Soil Carbon Sequestration
    - Water Management in Rice Production
- ...and Nitrous Oxide to be developed.
- Task Forces comprising lead authors, contributing authors and review authors, were established.
  - Task Forces prepared Flagship project proposals that outline work to be done, the resources available, and the resources needed (including types of resources, e.g. research funding, post-doc, etc.).

# GRA Flagships - fundamentals



- The flagship should offer unique **GRA added value** by utilising the knowledge and expertise across the GRA member countries and Partners.
- The flagship must be **inclusive** and provide opportunities for all GRA members and partners to be engaged in some way. Lack of new funding to allocate to flagship projects by individual countries should not be or remain a major barrier to those countries engaging in activities to which they could add value, and from which they could gain benefit.
- The range of projects should be **relevant**: all GRA members need to have benefit from some or all of the flagship. It is unlikely that every individual project will provide benefit to everybody, but the collection of projects and activities should provide benefits to all GRA members.



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# Enteric fermentation flagship

## Development of **solutions**

- **Animal selection** – data sharing & analysis to facilitate development of genetic/genomic markers (microbial & animal) for low emission traits
- **Feeding** – identification, testing & improved quantification of low emitting feeds suitable for incorporation into the diverse range of animal husbandry systems found in GRA member countries
- **Microbiome** – Improved understanding of the processes involved in enteric CH<sub>4</sub> formation, characterisation and direct manipulation of the microbial populations
- **Animal health** – improved understanding how animal health has an impact on the enteric microbiome functioning in relation to methane production
- **Manure management** – exploring the options to improve the quality of manure from a fertilizer or energy source by fostering the enteric microbiome

## Improved **quantification** of livestock emissions

- **Improved 'emissions factors'** – the determination of methane yield (Y<sub>m</sub>) in temperate, tropical, rangelands/semi arid feeding systems and in by-product dominated diets
- **Improved activity data** - low cost innovative generation of data on animal performance, populations, feeding systems
- **Livestock Tier 2** inventory development – utilise expertise and experience of GRA Members

## Identification, testing and **implementation** of mitigation solutions to support NDC/INDC

- **Identification** of locally appropriate mitigation actions – e.g. feeding, breeding, animal health, reproductive performance
- **Pilot testing** of solutions – impact on mitigation, economics, food security, adaptation-mitigation synergies
- **Implementation** at scale – communication & promotion of tested mitigations, mainstreaming mitigation actions into existing development projects, support for NAMA development

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**Cultivar selection –**  
identification, testing &  
quantification of high  
yielding rice cultivars with  
low CH<sub>4</sub> emission.

**Modelling** – development and inter-comparison of process-based models to simulate CH<sub>4</sub>/N<sub>2</sub>O emissions soil C stock changes.

**Promotion** of solutions – by communication of tested mitigation solutions with stakeholders to support NAMAs and NDC.

**Coordinated networks** – of scientists and extensionists, private-sector, and farmers for accelerating the wide-scale adoption of best-fit management options.

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Online collaborative knowledge hub

## **Developing** solutions

- Decision support toolbox
- Maps of SCS **potential** (e.g. to reach the 4 per 1000 aspirational target)
- Maps of **crop and pasture practices** suited to reach SCS targets
- Implications** of SCS practices for - yields, - drought tolerance and climate change adaptation - N2O and CH4 emissions, energy use
- Costs and benefits** of transitioning to SCS practices

## **Monitoring** solutions

- Enabling methods to certify SCS
- Tiered **methodologies** for monitoring, reporting and verifying (MRV) soil organic carbon (SOC) stocks in crop and pasture systems
- Handbooks and guidelines** for project scale MRV adapted to regional contexts and agricultural systems
- Technologies for rapid SOC **stock verification**
- Modelling** of SOC stock change in crop and pasture systems

## **Adopting** solutions

Enabling environment

- Regional stakeholders **workshops** on SCS
- **Criteria** for sustainable SCS projects supporting livelihoods
- **Assessment of barriers** to the adoption of SCS practices
- Value chains, business models and policy **options**
- Research funding **strategy** and international research cooperation

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| Capacity building and training |
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Provide **targeted support** for countries for designing agricultural **monitoring, reporting and verification (MRV)** within NAMAs or Low Emissions Development pathways based on improved inventories

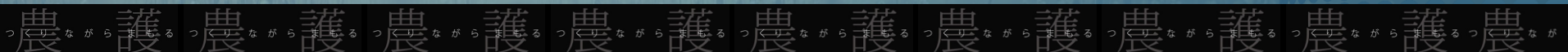
- Adaptation in ruminants for increased productivity and lowered environmental impact
- Improved quantification of the effects of feed and nutrition on enteric methane emissions from cattle managed under a wide range of production conditions and environments
- Relating ruminant diet, methane output and animal production to the rumen microbiome
- Grazing livestock systems

- On farm assessment of multi-beneficial improved water management techniques, reducing costs, water use and gas emissions in America's rice systems.
- Multi-country on-farm assessment of multi-beneficial integrated management techniques in the rice sector of Asia
- Identification of high yielding rice cultivars as related to low methane (CH<sub>4</sub>) emissions

# GRA Flagship projects - list

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## Inventory

- 'Best practice' guidelines for incorporation of mitigation into national inventories.
- Guidance on Inventory Tiers
- Developing guidance for good implementation of higher Tier methods in national inventories
- Developing guidance for good implementation of Tier 3 models in national inventories
- Database and Inventory Refinement for GHG Emissions associated with Manure and Nitrogen Management
- Developing guidance for improving emissions from manure management in national inventories
- Towards a national livestock methane database project
- Identifying emissions and mitigation options by mapping analogous production systems
- Establishment of GHG measurement, mitigation, adaptation and inventory Centre in West Africa.

## Soil Carbon Sequestration

- Crop and pasture practices for SCS: potential and agronomic implications
- MRV for strategies for SCS
- Adoption of practices and socio-economic barriers

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## GRA Joint Programming

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- GRA Council adopted its first Strategic Plan, which included in its priority actions:
  - ❖ to undertake GRA **joint programming** on an annual basis, beginning no later than August 2017, to support collaborative research, including GRA Flagships.
- GRA Council formed a working group to advance the development of joint programming to identify suite of different mechanisms that could be utilised by GRA to align and mobilise resources.
- Intention is to have more deliberate and well planned coordination within the GRA and between the GRA and its partners.
- Specific outputs/activities identified by Flagship Task Forces and GRA Research Groups that require resourcing will be used as the basis for calls, Fellowships, and other mechanisms to be developed through GRA joint programming.



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- Working group prepared a working paper to outline a series of possible GRA ‘joint programing’ mechanisms that could be adopted by the GRA members for resourcing and coordinating collaborative research and capability building.
- Mechanisms identified include:
  - **GRA Fellowship Fund (priority topics, research fellows)**
  - **Bilateral funding arrangements (topics aligned with GRA priorities)**
  - **GRA Thematic Annual Programing (alignment of existing programmes, sharing data)**
  - **Multi-partner research call (common topics, coordinated timing, intra-national funding)**
  - **Fund for International consortia (common topic, coordinated timing, inter-national funding)**
- GRA Council Members were consulted on the above mechanisms and feedback sought on their interest in being involved.

# Some examples of joint programming opportunities

- FACCE-JPI ERAGAS project on improved estimation and mitigation of nitrous oxide emissions and soil carbon storage from crop residues
- GRA-CCAFS Scholarships – NZ funded, but opportunities for others and for hosting 30-40 PhD research visits (4-6 months) linked to GRA and CCAFS research projects
- AfricaRice GRA Workshop – September 2017 – opportunity to plan GRA activities in sub-regions of Africa.
- N<sub>2</sub>O – Asia Pacific Regional Network for GHGs – Australia + 100 partners
- Other....?

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ありがとうございます  
Arigatou gozaimasu