GHG Nexus

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1st FACCE ERA-GAS Research Programme Meeting
Wageningen, 10 - 11 October 2017

FACCE ERA-GAS
MONITORING & MITIGATION OF GREENHOUSE GASES FROM AGRI- AND SILVI-CULTURE

GLOBAL RESEARCH ALLIANCE
ON AGRICULTURAL GREENHOUSE GASES

The project receives funding from the European Union's Horizon2020 Research & Innovation Programme under grant agreement No 696356.

Global Research Alliance on Agricultural Greenhouse Gases (GRA)

- Brings countries together to find ways to grow more food without growing GHG emissions
- Launched in 2009
- Now has 49 member countries from all regions of the world

FACCEJPI

Background

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- FACCE-JPI became a partner of the Global Research Alliance on Agricultural Greenhouse Gases (GRA) in Dec 2016
- GRA represented on the FACCE StAB

Aim

- To ensure maximum efficiency of the global research effort
- Identify opportunities for coordination and collaboration

GHG Nexus

- a new joint initiative between FACCE ERA-GAS and the GRA

Aim: *to enhance the outputs and impact of the funded FACCE ERA-GAS projects by opening them up to participation from GRA member countries,* where there is mutual interest and benefit.

- Participation is voluntary!
- Resourced separately
- Existing contractual arrangements unchanged

GHG Nexus - Benefits

For researchers:

- New or enhanced collaborative links not just in Europe but globally
- Expanded datasets for more powerful modelling
- Research results that extend beyond the European context
- Access to specialised expertise, analysis or equipment

GHG Nexus - Benefits

For FACCE ERA-GAS, the GRA and beyond:

- Aligns FACCE ERA-GAS with the aim of making H2020 “open to the world”
- Address grand societal challenge more effectively
- Greater impact from R&I investment
- Better coordination and alignment of research globally

GHG Nexus - Mechanism

1. Interested GRA members identified
2. Available resources defined and communicated to FACCE ERA-GAS project partners
3. ~ 2 months to develop a proposal with partners from GRA countries
4. Peer-review evaluation by international experts to ensure quality standard
5. Approval given for the enlargement actions to be advanced

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GRA Flagships and ERA-GAS

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ERA-GAS Kick-off meeting
Wageningen, 10 October, 2017

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AT A GLANCE

49 member countries

4 Research Groups

- Paddy Rice Research Group
- Livestock Research Group
- Croplands Research Group
- Integrative Research Group

20 Science Networks

14 partner organisations

Over **3000** scientists involved in activities of the GRA

44 international collaborative projects supporting the GRA

50 fellowships awarded to recipients from **25** countries

19 technical training workshops held

12 technical guidelines, resource materials and databases produced








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@GRA_GHG

October 2017

GRA Flagships – guiding principles

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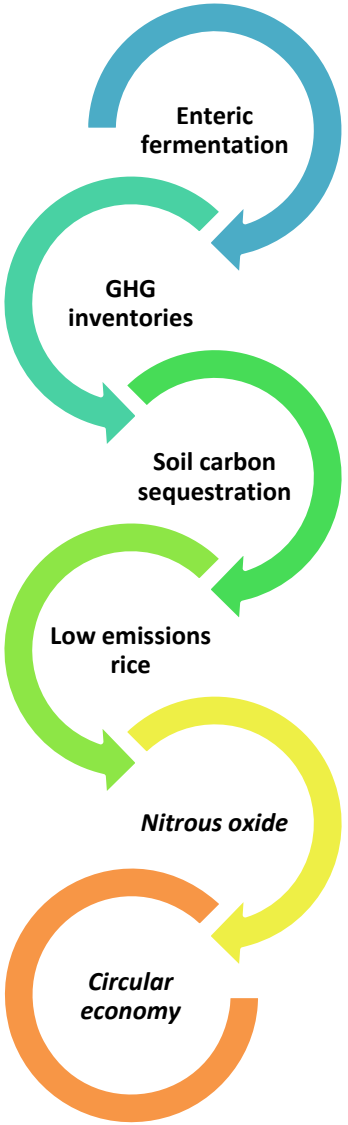
- GRA added value
- Inclusive
- Relevant
- Solution focused
- Multifaceted
- Increasing capacity/capability



Enteric fermentation

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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_4 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 (Ym) in temperate, tropical, rangelands/semi arid feeding systems and in by-product dominated diets
- **Improved activity data - l**ow cost innovative generation of data on animal performance, populations, feeding systems
- **Livestock Tier 2 i**nventory 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

GHG inventories

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Enhancing *inventory structure*

Regional and source-specific **guidance** for the development of advanced inventories

Tier 2 **inventory development** – utilise expertise and experience of GRA Members

Guidance for development and adoption of **modelling approaches** (i.e. Tier 3) for specific sources within inventories.

Building *capability*

Analyses of current methodologies for estimating GHG emissions adopted in national GHG inventories by source, **barriers to adoption** of advanced methods and **experiences of countries** in adopting advanced methods (networks and reports from international workshops, technical and summary papers)

Identification of **training needs**; country-specific guidance and training needs developed jointly with countries.

Delivery of **targeted technical training** to improve emission factors and design inventories that work with existing national and regional data sources.

Acquisition and administration of *data*

Incorporation of **improved emission estimates** in emissions databases (e.g. IPCC-EFDB, GRAMP, SAMPLES, MAGGnet) and activity databases.

National and regional **research projects** that validate existing measurements and identify and validate approaches (measurements and modelling methodologies) to reduce the emissions intensity of food production and ensuring that those gains can be captured in inventories.

Dissemination of improved estimates of GHG emissions developed from regional and national projects to inform the **development and verification of methodologies** by the IPCC and other inventory support mechanisms

Demonstrating *mitigation* in NDCs

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

Soil Carbon Sequestration

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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
  - N_2O and CH_4 emissions, energy use
- Costs and benefits of transitioning to SCS practices

Monitoring solutions

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 stakeholder 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

Capacity building, knowledge transfer and training

Low emissions rice

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Developing *solutions*	Improving *quantification*	*Adopting* solutions	Building *capabilities*
• **Water management** – conducting multi-country experiments on commercial size farms to assess the effects of AWD as a mitigation solution • **Organic matter management** – identification, testing & quantification of improved management of crop residue and manure as a mitigation solution • **Cultivar selection** – identification, testing & quantification of high yielding rice cultivars with low CH_4 emission	• **Database compilation** – sharing experimental information and emission data among members • **Improved 'emission factors'** – improving emission and scaling factors for CH_4/N_2O emissions and soil C stock changes in country/region by analysing emission monitoring data • **Modelling** – development and inter-comparison of process-based models to simulate CH_4/N_2O emissions soil C stock changes	• **Identification** – of areas where AWD can be applied and optimized to reduce yield loss risks, water and carbon footprints of rice systems • **MRV guidelines** – measurement, reporting, and verification (MRV) guidelines for implementing the solutions to GHG mitigation actions • **Promotion** of solutions – by communication of tested mitigation solutions with stakeholders to support NAMAs and NDC	• **Workshops** – to enhance the technical and institutional capacity to conduct relevant GHG research in the Group • **Coordinated networks** – of scientists and extensionists, private-sector, and farmers for accelerating the wide-scale adoption of best-fit management options

Figure 1: Mapping ERAGAS and SusAn to GRA Flagship research topics

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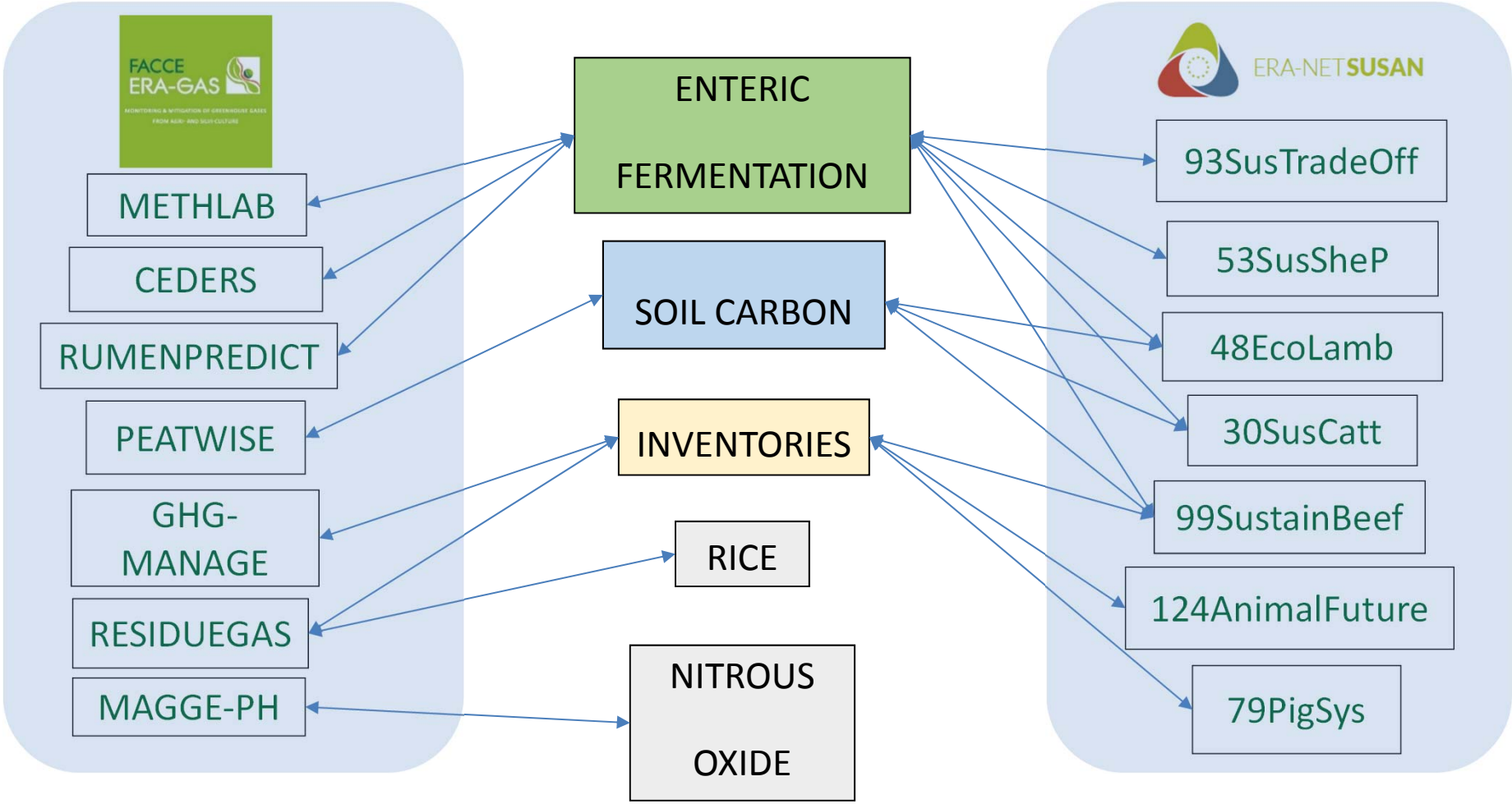

What is the opportunity?

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- The opportunity exists to link ERA-GAS projects to the GRA Flagships and/or research activities, by inviting GRA members' to participate as additional project partners in order to extend the outputs and impacts of the project.

- Any additional activities undertaken as part of a project enlargement will be funded/resourced separately from the existing arrangements in place between the FACCE ERA-GAS project partners and consortium members.

- Enlargement could be through any/all of the following:

    - Expanding geographic coverage – e.g. more data from different regions
    - Expanding system coverage – e.g. rice residues as part of more general crop residue project, or additional animal species
    - Expanding research focus, e.g. other feed additives beyond antimicrobials

Initial GRA member interest in ERA-GAS

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- METHLAB – Uruguay (INIA),
- CEDERS – Uruguay (INIA), NZ (support a post-doc, support developing countries to collect data through the capability building plan of the LRG – work planned during 2018),
- PEATWISE –
- MAGGE-PH – Uruguay (INIA), Ghana (CSIR)
- RUMENPREDICT – Uruguay (INIA), Ghana (CSIR), NZ (support a post-doc),
- GHG-MANAGE – Uruguay (INIA), Ghana (CSIR)
- RESIDUEGAS – Uruguay (INIA), Ghana (CSIR)
- Other possible interest:
  - Spain
  - Procisur/Fontagro/Arg/Br/Ch/Uy/Py/Ni/Ec/DR (legumes in pastoral livestock systems)

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Thank you