

GLOBAL RESEARCH ALLIANCE

ON AGRICULTURAL GREENHOUSE GASES

GRA Council Meeting, Dublin, Ireland

3-4 June 2025

Research Group Co-Chairs' Report

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ON AGRICULTURAL GREENHOUSE GASES

GRA Council meeting, Dublin

Dublin 2025

CRG Report

María Rosa Mosquera-Losada

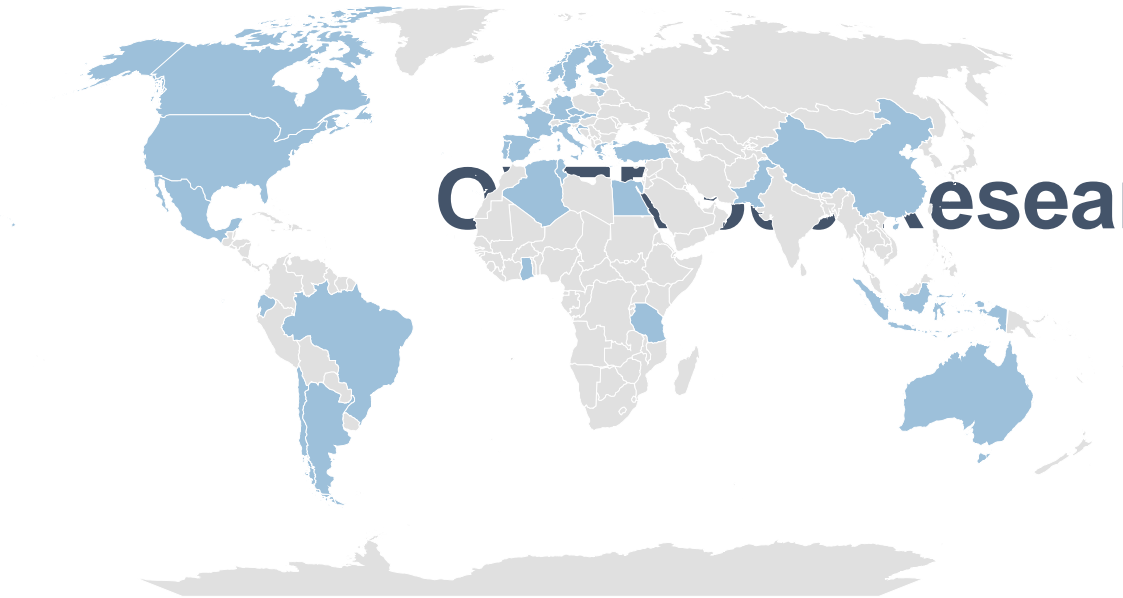
Ladislau Neto

Cropland Research Partners Group

Series1

1

Qatar researchers



- Projects
- Papers
- Relevant conferences and courses
- PhDs
- Others

- **Projects**
- Papers
- Relevant conferences and courses
- PhDs
- Others

Forestry



Agroecology



Pyric herbivorism



PYRICLABS

Ecosystem Services



SAWA-WATER

Bioeconomy



Cooperativism upscaling

GREENCOOP

Agroforestry



AFCLIMA-DEMO



Land use and soils

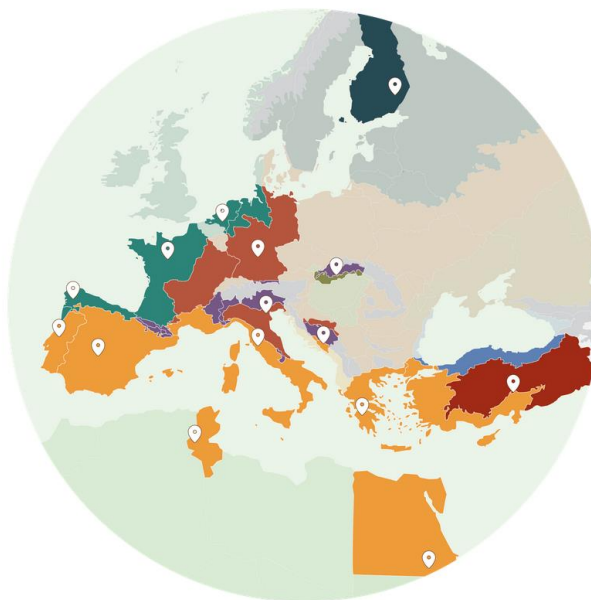


25000000 euros

Consortium & Living Labs

22 Partners
from 13
Countries

15 Living Labs



Boreal

Atlantic

Continental

Alpine

Pannonian

Mediterranean

Black Sea

Anatolian

Land use and carbon sequestration



LUCAS DATABASE

Biochar Testing!

GRASS-ROOT PROJECTS

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CLIMALACT: Development of sustainability indicators linked to livestock grazing and forage practices extensive, semi-intensive and intensive guaranteeing sustainability and climate neutrality of the farms and their value chains in collaboration with the Milk companies delivering the 60% of the milk in Spain



ASH4SOIL: Development of fertilizers coming from the forest biomass industry residues linked to the production of electric energy and manure

Services to support the development of the Global FRA Study on Agroforestry Monitoring USC-FAO

- Centre of America
- West Africa
- Asia



- Projects
- **Papers**
- Relevant conferences and courses
- PhDs
- Others

CC-Adaptation: ECUADOR Chalampunte-Flores, D.; Mosquera-Losada, M.R.; Ron, A.M.D.; Tapia Bastidas, C.; Sørensen, M. Morphological and Ecogeographical Diversity of the Andean Lupine (*Lupinus mutabilis* Sweet) in the High Andean Region of Ecuador. *Agronomy* 2023, 13, 2064. <https://doi.org/10.3390/agronomy13082064>

CC-Mitigation: PORTUGAL: Santos M, Mosquera-Losada MR and Gonçalves B. Can the trees save the crops? Predicting the services provided by traditional and novel agroforests in changing Mediterranean landscapes. Ref. revista/Libro: Front. Ecol. Evol. Clave: A Volume: 11:1168247. Páginas, inicial: 01 final: 03 Data: 2023 doi: 10.3389/fevo.2023.1168247

GLOBAL: Mosquera-Losada MR Título: Inaugural editorial of Discover Agriculture. Discover Agriculture Data: 2023 <https://doi.org/10.1007/s44279-023-00002-1>

* 3 special issues

- Projects
- Papers
- **Relevant conferences and courses**
- PhDs
- Others

European Commission invitation:

Maria Rosa Mosquera Losada, *EUROPEAN CAP NETWORK CONFERENCE 'EIP - AGRICULTURAL OPERATIONAL GROUPS: INNOVATION IN PRACTICE'* Reflecting on the role of grassroot innovations for the future of agriculture, forestry and rural Areas

Conference Fire in the Earth System:

- *Forest fire risk environment analysis in contrasted biogeographic regions of Spain.*
- *Economic analysis of the pyric herbivorism in Spain.*

International agroecology conference

- *European perception on agroecological weed management and herbicides*

International Oak Symposium

- *Round table on forest fire prevention*

REFRESCAR

Maria Rosa Mosquera Losada, AF4EU: Agroforestry Business Model Innovation Network, 'Agroforestry in Europe', jointly organised by RefreSCAR and actors of the EU CAP Network (National Rural Network) which took place in Coruche, Portugal, on September 25th 2024.

INTERNATIONAL COURSES:

- *Climate change emergency, land use and food production: sustainable management and food security*

- Projects
- Papers
- Relevant conferences and courses
- **PhDs**
- Others

Spain: Darío Arias Martínez: Analysis of agricultural and forestry innovation in the European Union Thematic Networks and the innovative use of sewage sludge in silvopastoral systems soil.

Palestine: Subhi Salman. Biochar: woody perennials source and process impact on crop production

Ireland: Rachel Irwin An investigation of Irish dairy and drystock farmers' perceptions of, and attitudes toward, adopting agroforestry practices; and the barriers they face when doing so.

PORTUGAL: Ana Carolina Farias de Oliveira. Global change and pastoralism in Montesinho Natural Park: a multi-scale approach

PORTUGAL: Júlio Henrique Germano de Souza. Assessment of the contribution of grazing services to climate change mitigation along three Atlantic-Mediterranean gradients, Portugal

ARGENTINA: Mariana Jimena Ferreyra. Agromorphological, genotypic and ecogeographical characterization of *Phaseolus vulgaris* L,

ECUADOR: Angel Eduardo Rengel Santin. Strategies for forest hydrological regeneration in water supplying micro-basins in the Loja canton

SPAIN: Diego Vázquez Miramontes. Developing new models of managed grazing for environmental purposes

SPAIN: María del Carmen Mosquera Losada. Land use impact on soil health

ECUADOR: Leider Tinoco Tamarillo. Agroforestry coffee and cacao biodiversity characterization in Ecuador

- Projects
- Papers
- Relevant conferences and courses
- PhDs
- **Others**

Newsletter has been produced, the next one scheduled in December

Meetings with European policy makers included those to develop better policies (Civil Dialogue Groups), monitoring exercises for the next CAP

FAO agreement to develop a monitoring methodology for AF at FRA scale (over 200 countries): Monitoring!

European Parliament meeting, next November

EU Committee of Regions Meeting next November

Thank you very much for your
attention!

mrosa.mosquera.losada@usc.es

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GRA Council Meeting, Dublin

June 2025

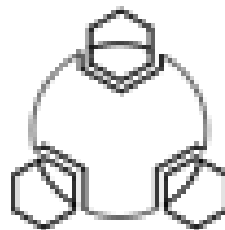
Integrative Research Group Report

INTEGRATIVE RESEARCH GROUP

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Research Group Aim

To foster collaboration across all Research Groups to reduce greenhouse gas emissions intensity while improving the overall production efficiency within agricultural systems



Co-Chairs

Jean-François Soussana

INRAE—National Research Institute for Agriculture, Food and Environment, France

Pamela Joosse

Agriculture and Agri-Food Canada

Heather McGilvray

Department of Agriculture, Fisheries and Forestry, Australia

INTEGRATIVE RESEARCH GROUP RESEARCH NETWORKS

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NETWORKS	COORDINATORS
Inventory and Nationally Determined Contributions (NDC) Network	Andrea Pickering, (New Zealand) Ngonidzashe Chirinda, (Morocco) Mai Van Trinh, Vietnam) Natalie Doran-Browne, (Australia)
Indigenous Research Network	Simon McDonald (NZ) Shiloh Babbington (NZ) Angelika Tugaga (Samoa)
Farm To Regional Scale Integration Network	Claudia Heidecke (Germany),
Soil Carbon International Research Consortium	Dr Suzanne Reynders (France)
Circular Food Systems	Mirjam Spoelstra (WUR) Flavia Casu (FAO)



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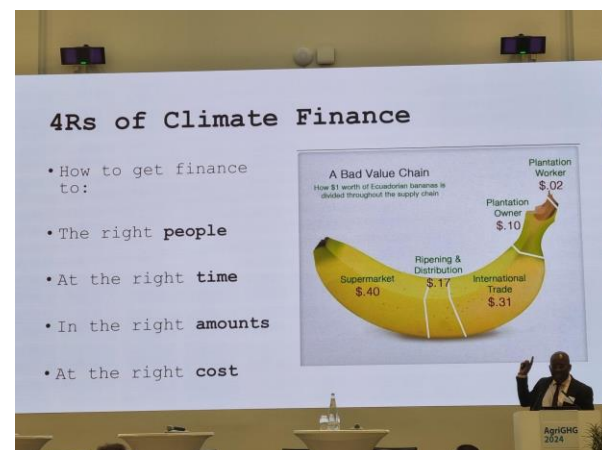


Inventories and NDC Network

Inventories and NDC Network

Inventories and NDC network meeting (24 Oct 2024, Berlin)

- Held in the margins of the AgriGHG Symposium
- Focus on the science to policy interface
- Presentations from:
 - Dr Andrea Pickering (Network Co-Lead)
 - Professor Rowena Maguire (Queensland University of Technology)
 - Koen Deconink (OECD)
 - Paolo Medei (FAO LEAP)
 - Ben Morrow (Network Support)
- Subsequent discussion session facilitated by Dr Ngonidzashe Chirinda (Network Co-Lead).
- The facilitated session identified several important comments for the Network to take on board:
 - Dissemination of information and linking people/projects with finance options
 - Capacity building and investing in people
 - Guidance documentation on common problems such as data i.e., what is needed, where to find it, and what to do in its absence.



Inventories and NDC Network

Activities undertaken under the Global Research Alliance Agriculture Inventory Training Programme (GRAIT) <https://graindc.org/grait/>

- Presented on the importance of Science to Policy, provided training on the IPCC software and promoted GRAIT at the Pacific Regional Workshop on the Enhanced Transparency Framework, Fiji (May 2025).
- Presented at the Enhanced Transparency Framework workshop for Polynesian countries in the Cook Islands (Mar 2025).
- Study tour to New Zealand for 4 participants from the Philippines, 7 from Fiji and 3 from Samoa to help build agricultural Inventory and NDC capacity in these countries (March 2025).
- Technical training workshops held on agricultural inventory capability building with Samoa (Sept 2024, and Feb 2025).
- Presented at First National Training of Trainers Seminar on Development of a PNG Comprehensive GHG Emission Inventory Framework to Support First BRT Submission (Oct 2024).



Inventories and NDC Network

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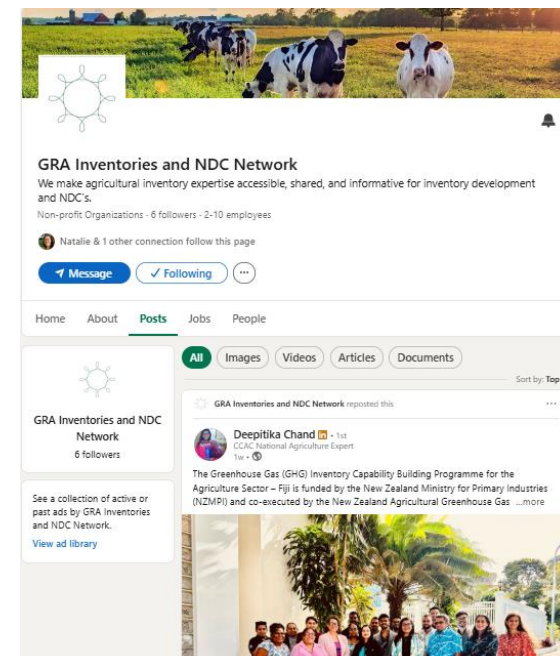
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Key updates

- LinkedIn account opened
<https://www.linkedin.com/company/gra-inventories-and-ndc-network/>
- I&NDC website updates
- Quarterly Who's Counting newsletter (August 2024, November 2024)
<https://graindc.org/resources/newsletters/>
- I&NDC Network will be involved in the project on incorporating Animal Health metrics into national agriculture inventories (Harry Clark leading)
- LEAP proposal submitted and accepted on Guidance on incorporating mitigation technologies into National inventories
- Involved in project developing a protocol for including mitigation actions in Agricultural Lifecycle Analysis for Dairy (MiLCA)

Upcoming opportunities

- Project on reducing enteric fermentation emissions through feeding papaya seeds and mango (skin and seeds) to cattle is investigating avenues for support



I&NDC
Network.



Issue 13 - August 2024

Who's Counting is the quarterly newsletter of the **Inventories and Nationally Determined Contributions Network (I&NDC Network)**. We summarise scientific progress, opportunities, resources and events related to national agriculture inventory development, national agriculture climate targets, and international inventory capability-building activities.

If members have a particular region or issue they would like to be the focus of future Newsletters, we welcome you to get in touch (indc_gra@gmail.com).

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Indigenous Research Network

Indigenous Research Network

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APEC workshop series - **The Power of Inclusivity**

- Lead of the IRN, Shiloh Babbington travelled to Peru to carry out the second workshop focused on empowering indigenous youth in climate decisions and actions. Overall, this series included 41 different countries from across APEC and GRA.
- This APEC workshop series gained the IRN an additional 17 member countries.



Indigenous Research Network

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Connections

- New Zealand and Peru connecting through ancestral food pathways to a more sustainable future.
- IRN in The United States gaining connections with Indigenous research institutes and policymakers.
- IRN hosting international delegations from Malaysia and the Philippines in New Zealand discussing potential membership and priorities.
- IRN and Australian First Nations Ambassador establishing a relationship and goal toward COP 31.





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Farm to Regional Scale Network

Farm to Regional Scale Network

AgriGHG Symposium (Oct 2024, Berlin)

- Excellent keynote presentations
- 60 talks and 80 posters
- Panel discussions
- Lively exchange and exchange

Finalizing paper on "Opportunities and challenges of farm-level GHG accounting" lead
D. Bretscher

MACSUR SciPoINet project started 2025

Current network lead: Claudia Heidecke, GER

Who wants to team up as network lead?





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Soil Carbon International Research Consortium

Some background context...





A unique & long lasting Consortium



EU funding

But...



**Own financing
Independent from EU funding**



**International Consortium
Worldwide & expanding !**



**International project
Worldwide !
Cf our Regional Ambassadors**



Independent science driven network !

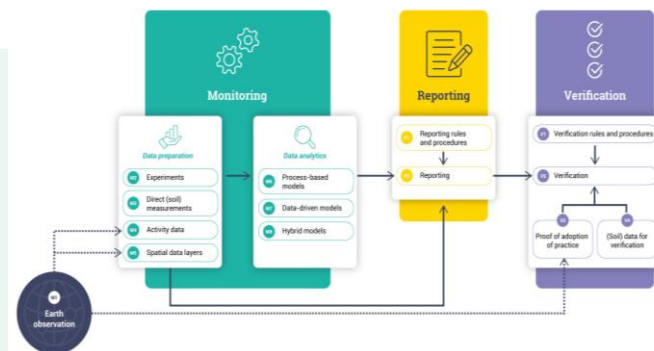
Our Regional Nodes Ambassadors



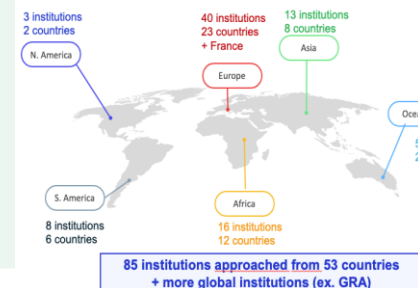
An internationally harmonized MRV framework to raise awareness and develop scientific knowledge and methods on how to Measure, Report and Verify soil carbon stock changes in various contexts of application (Offsetting, Insetting, NDC's, CAP...)

The Impact4Soil platform to drive cooperation and knowledge sharing on soil carbon at international level.
5 modules: maps (visualization of carbon stock and evolution over time), scientific evidence (from metanalysis), practices (from verified sources), data (from scientific repositories), network of initiatives and stakeholders.

A Research alignment and calls program through an aligned Strategic Research and Innovation Agenda considering all types of land use in each region; and through Knowledge hub and Thematic Annual Programming activities to facilitate international collaboration between projects for the Soil Carbon IRC members.



Approached institutions and countries



Past Workshops

- African Node Workshop (26-29 May 2025, Nairobi Kenya)
- Second South East Asia Node workshop (May 22nd 2025)
- US node Workshop dedicated to Monitoring Reporting and Verification (14-16 May 2025, Colorado State University)
- Online webinar with European expert group CRCF [Carbon removals of the European commission](#) EU Directive CRCF May 7th 2025
- Australian and Pacific Island (FIJI) Workshops (20 March-April 3rd 2025)
- [Policy Workshop on International Carbon Certification Schemes](#) (26 September 2024, Brussels/Belgium)
- Soil Carbon for African agriculture - ORCaSa side event (30 July 2024, Rwanda)
- First South East Asia regional node workshop (Vietnam, Cambodia, Thailand, Laos)(27-31 May 2024, Hanoi Vietnam)
- Monitoring Cropland Soil Organic Carbon (SOC) stock changes - Joint workshops ORCaSa/MARVIC (24 and 25 April 2024 - Online)

Future Workshops

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- Online webinar Datasets and Data papers on Soils in Africa (Online June 11th 2025)
- **Soil Carbon Research symposium** (Rio de Janeiro 25-28 june 2025)
- Soil Carbon International Research Consortium Steering committee and Scientific and Technical Committee meetings (Rio de Janeiro 23-24 june 2025)
- France-Quebec Cooperation meetings (Montreal Canada 15-19 September 2025 + Toulouse France 29 Sept -3rd October)

LATIN AMERICAN & CARIBBEAN

Soil Carbon Research Symposium

Save the date – **June 25-28, 2025**



Documents

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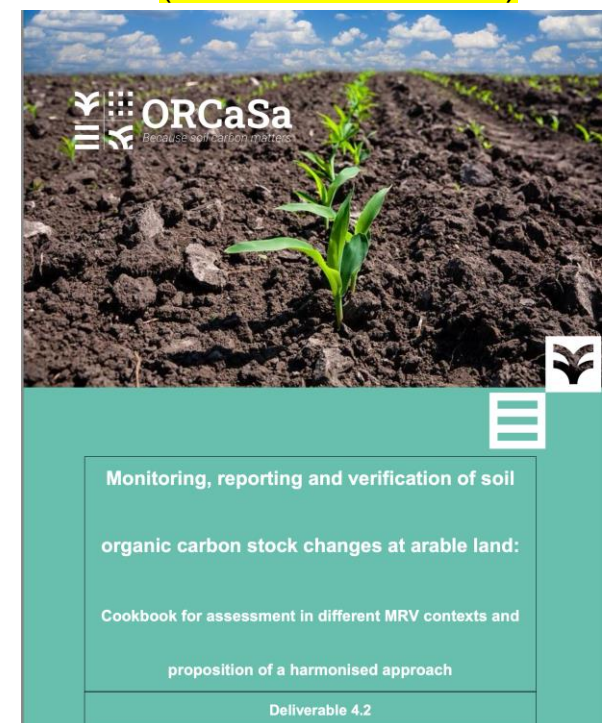
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IMPACT4SOIL PLATFORM



MRV COOKBOOK
(available at demand)



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Circular Food Systems Network

Circular Food Systems Network

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Activities for this year:

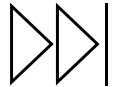
- Organisation of a webinar series on the Principles of Circular Food Systems.
- The CFS Network is funding a research project for the topic: *Surfacing the Value of Circularity: Making the Benefits Visible Beyond Measurement*.
- Planning a side event at International Farming System Design Conference in France in August 2025.
- The CFS Network funded three research projects on measuring circularity in agri-food systems:
 - AgResearch NZ: A holistic framework for circular food system assessment
 - Wageningen Environmental Research: Circularity in integrated systems : resource recovery for feed, fuel and (organic) fertiliser self-sufficiency in Ethiopia
 - Wageningen Plant Sciences: Circularity in integrated systems: resource recovery for feed, fuel and (organic) fertiliser self-sufficiency in Ethiopia

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IRG next steps



Next steps

- **Research Group Restructuring:**
 - Discussions are ongoing about potential reorganisation of the CRG and IRG, considering the role of existing networks within these groups.
 - The next steps of the group dependant on outcome and proceeding discussions of this council session
- **Engaging with IRG members** on the outcome of restructure to ensure community of researchers remain connected
- **Continue progressing the work underway in the networks**, including linking research to knowledge transfer and policy connections
- **Continuing to work with the other Research Groups** on the opportunities presented by a restructure

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GRA Council meeting, Dublin

June 2025

Livestock Research Group report

LIVESTOCK RESEARCH GROUP

RECENT ACHIEVEMENTS

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The **16th annual meeting of the Livestock Research Group (LRG)** was held in Berlin, Germany on 24th October 2024 – just after the 2024 Agri-GHG Symposium.

Co-Chairs:

Tommy Boland (Ireland),
Richard Dewhurst (United Kingdom)
and Sinead Leahy (New Zealand)

Participants:

46 participants, including both in-person and online attendees, representing at least 21 member countries.

GRA Partners attending:

CCAC, European Commission,
CGIAR, FAO, Environmental Defense
Fund, Global Methane Hub, World
Bank

Key outcomes/priorities for 2025:

- Explore opportunities for **broader dissemination of the Feed Additive Flagship outputs** to wider stakeholders (both academic and industry).
- Identify **key messages for presentation to the GMH**, working through Co-Chairs and Network Leads.
- Consider additional actions the GRA or LRG can take to **enhance science-to-policy engagement** as part of the wider GRA Council-led initiative.
- **Skill development and capacity building**, including a shortage of early-career researchers. This is particularly evident in LMICs and in relation to policy and practice change.

LIVESTOCK RESEARCH GROUP

RECENT ACHIEVEMENTS

Delivery from Networks

Animal Selection Genetics and Genomics Network

Exploring the impact of genetics technologies for managing livestock GHG emissions.

- Lead: Suzanne Rowe
- Over 200 members, in 40 countries; few in Africa & Southeast Asia
- The network organised webinars and publications and has support from CLIFF-GRADS alumni to help with website and communications
- Enteric Flagship: more than 1,000 samples collected over five countries. This is an on-going projects and samples can be sent for analysis.
- Methane Predicts: Project funded by New Zealand and Ireland - developing and validating high throughput predictors for large capacity screening of methane emitting ruminant at individual and system level.
- Grass to Gas (FACCE ERA-GAS project): sharing protocols and technology

LIVESTOCK RESEARCH GROUP

RECENT ACHIEVEMENTS

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Delivery from Networks

Rumen Microbial Genomics Network

- New larger leadership team – Milka Popova, Jana Seifert, Yanfen Cheng
- Funded collaborative projects – **MASTER** and **HoloRuminant**.
- Building GRA Flagship ‘culturomics’ project – funding from Global Methane hub and Schmidt Futures.
- 2025 In-person Workshop, Clermont-Ferrand June 2nd:
<https://globalresearchalliance.org/event/rumen-microbial-genomics-network-rmg-2025-in-person-workshop/>
- 2025 Webinar Nagoya Protocol: what does it mean in practice?
<https://globalresearchalliance.org/updates/?search=nagoya>
- Online workshop : Rumen Microbes: Back to the roots of culture
<https://globalresearchalliance.org/n/recording-available-rmg-webinars-rumen-microbes-back-to-the-roots-of-culture/>



LIVESTOCK RESEARCH GROUP

RECENT ACHIEVEMENTS

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Delivery from Networks

Animal Health Network

- Co-Leads Nick Wheelhouse and Şeyda Özkan
- Nick Wheelhouse authored the Livestock 4 Data decisions brief “The climate investment case for the livestock sector”
- Co-leads involved in a Frontiers in Sustainable Food Systems paper entitled “Environmental and food security implications of livestock abortions and calf mortality: a case study in Kenya and Tanzania”
- Co-lead Şeyda Özkan authored a technical report and a policy brief on the role of digital extension services for livestock on tackling methane emissions
- Co-leads are actively participating in the project Animal Health and Climate Phase 1 funded by Global Methane Hub and coordinated by Environmental Defense Fund, including organising online and in-person workshops and leading writing of sections

LIVESTOCK RESEARCH GROUP

RECENT ACHIEVEMENTS

Delivery from Networks

Feed and Nutrition Network

- Co-Leads: David Yanez-Ruiz and Andre Bannink
- Membership of the network increased to 102 in the last year
- The main activity of the network has been completing the flagship project on feed additives, which included: publishing 6 scientific papers; organising webinars to present and discuss the content; and preparing a dissemination material toolkit available to all authors, GRA and the Global Dairy Platform (GDP)
- We have strongly engaged and interacted with the GDP, who provided funding for a 2-year postdoctoral contract).
- The special issue will be also presented in special workshop at ADSA 2025 (June) and EAAP 2025 (September)
- ERANET project 'INTEGRITY' (coordinated by INTA Argentina) completed (2021-2025)

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RECENT ACHIEVEMENTS

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Delivery from Networks

Manure Management Network

- New Network Co-Lead Sven G. Sommer, alongside Hongmin Dong
- New leadership is actively organising webinars:
 - “B0 for IPCC inventories and biogas production”, 6 May 2025
 - “Manure management and GHG emissions in sub-Saharan Africa”, 16 June 2025
- Conference presentation specifically promoting the network:
 - RAMIRAN: “The GRA Manure Management Network: presenting research priorities for manure management in a changing world.” Presented by Dr. Sven G. Sommer
 - GGAA: “The GRA Manure Management Network: presenting research priorities for manure management in a changing world” Presented by Dr. David Pelster

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MAIN AMBITIONS

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Continued Support of networks

Significant support to help networks – especially those without major core projects.

Links with policy

Working closely with Council to develop this aspect, for example through producing briefs.

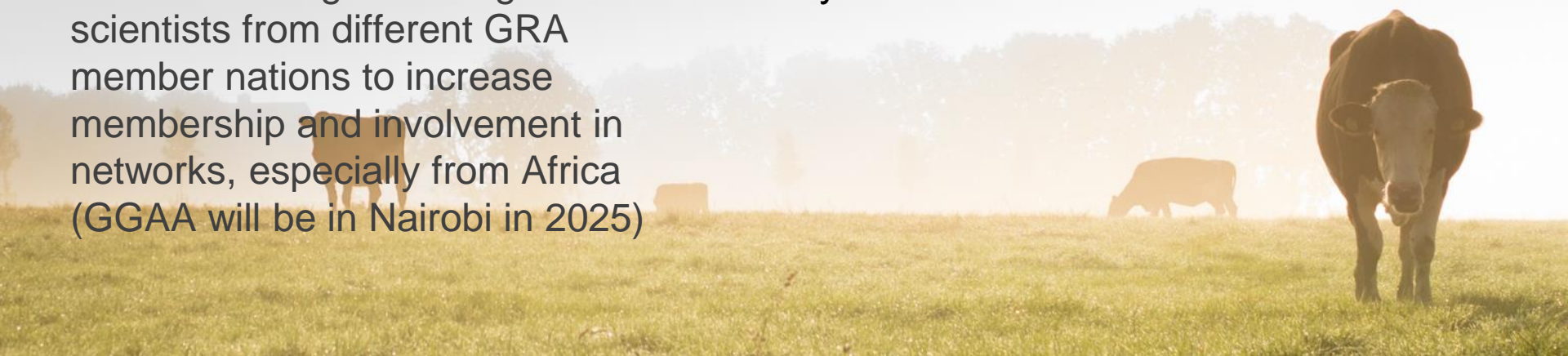
Network Activity

Facilitate dialogue among scientists from different GRA member nations to increase membership and involvement in networks, especially from Africa (GGAA will be in Nairobi in 2025)

Funding

Build on success of the NZ-IE calls to encourage more collaborative calls across groups of member countries.

Co-Chairs and Network Leads working to help develop concepts, consortia and proposals for the Global Methane Hub – for example by inputting to (and often leading) discussions on rumen physiology, GreenFeed methodology, early life nutrition etc...



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GRA Council meeting, Dublin

3 June 2025

Paddy Rice Research Group

Co-Chairs:

Alvaro Roel (INIA, Uruguay)

Omar Ndaw FAYE (ISRA, Senegal)

Yasuhito Shirato (NARO, Japan)

Summary of activity:

- No group meeting this year
- A project in Asia sub-group and Three projects in America subgroup (two from south America, one from the USA)
- A workshop in Taiwan, and a workshop in the Philippines.

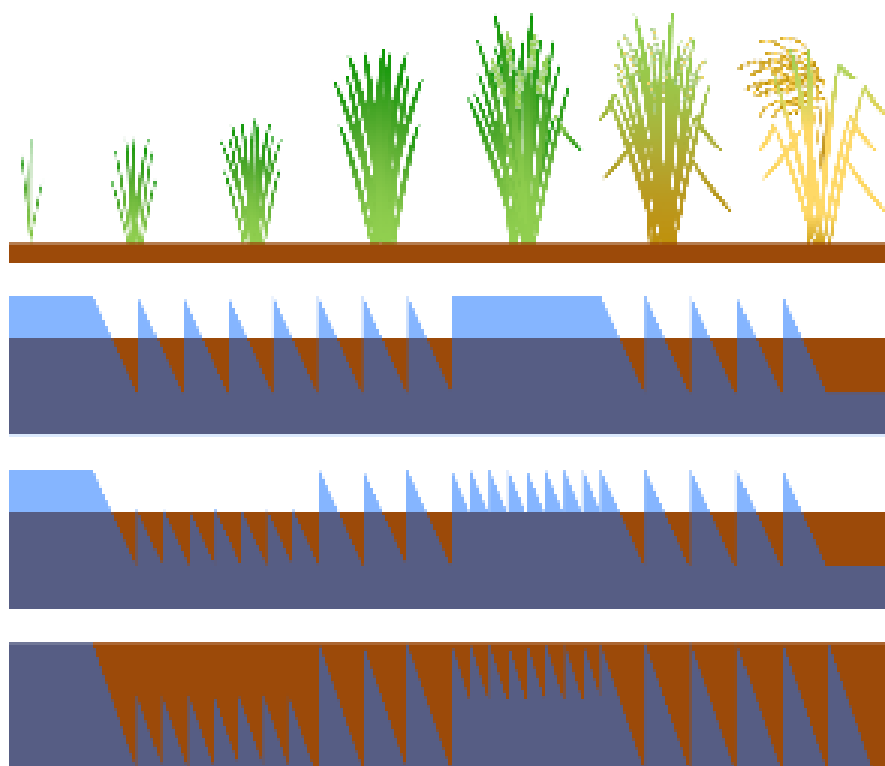
A project in Asia sub-group

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Mitigation in Irrigated Rice Systems in Asia (MIRSA) -4 project (2023~: Japan, The Philippines, Vietnam)

MAFF
Ministry of Agriculture, Forestry and Fisheries



Continuous flooding (conventional)



AWD: GHG -30%



More oxidative
condition

Target: GHG -60%

More oxidative water management with drought-tolerant rice variety to achieve more GHG reduction without yield penalty.

Asia sub-group

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A workshop on Regional Landscape of Sustainable Rice Production: Integrated Low-Carbon Technologies and Business Innovations (21-23 Oct. @Taiwan)

Organizer: Food and Fertilizer Technology Center (FFTC), Taiwan Agriculture Research Institute (TARI), Taiwan International Cooperation and Development Fund (ICDF), Vietnam Academy of Agricultural Sciences (VAAS), National Agriculture and Food Research Organization (NARO, JAPAN), Japan International Research Center for Agricultural Sciences (JIRCAS)

Objectives: Identify scalable low-carbon practices, tailor solutions to regional contexts, promote business and economic opportunities, develop actionable recommendations.

SOUTH AMERICA: Two Global Methane Hub funded Project.

- Developing Remote Sensing Capabilities for Rice Methane Monitoring in USA, Uruguay, Peru and Panama. FONTAGRO. Leader: Alvaro Roel INIA-Uruguay
- Towards sustainable , low-methane rice production in Latin America. IICA. Leader: Fernando Barrera & Isabel Martinez IICA Chile

Developing Remote Sensing Capabilities for Rice Methane Monitoring in USA, Uruguay, Peru and Panama

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The project has made significant progress in enhancing methane emissions measurement, reporting, and verification in rice cultivation across Latin America. A key achievement has been the standardization of methane measurement protocols in collaboration with the United States Department of Agriculture - Agricultural Research Service (USDA-ARS).

March – August 2025: Measuring CH₄ in Peru



28 de Febrero 2025
10:00 AM

COMISIÓN DE
REGANTES DE
FERREÑAFE,
LAMBAYEQUE

TALLER DE PRESENTACIÓN DEL
PROYECTO REGIONAL FONTAGRO

"MONITOREO SATELITAL DE
METANO, EN CAMPOS DE ARROZ DE
EEUU, URUGUAY, PERÚ Y PANAMÁ"

Ejecutores

Financiado por

En colaboración

PONENTES

Elizabeth Heras
Ph. D.

Cristhian Delgado
Candidato a doctor

Monitoreo Satelital de Metano en Arroz en Region

Cambio climático • El cambio climático se refiere a los...
de Metano en Arroz en Regiones Arroceras de América Latina

Un proyecto financiado por:

20 de marzo 9:00 - 10:00 a.m. (hora Colombia) Sala Trópico Teams

Organismos implementadores del proyecto:

Mirar en YouTube

Cristhian Delgado
Candidato a PhD
Universidad de Otago
Nueva Zelanda



Towards sustainable , low-methane rice production in Latin America. Brazil-Chile-Ecuador-Uruguay

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1. Diagnosis

2. Sustainable Research
Practices

3. Collaborative
Validation with
Farmers

4. Business Models

GhG measurements:

- Capacity Building
- New equipment's

Objective:

Emission factors of sustainable practices



Carbon Market Opportunities



USA : Current projects/activities on GHG emissions in the US.

Prepared by Arlene Adviento – USDA

GLOBAL
RESEARCH
ALLIANCE

ON AGRICULTURAL GREENHOUSE GASES

- Field research on hybrid rice, non-continuous flooding irrigation (AWD, furrow), smart N fertilizer (i.e. sulfur-enriched urea) for CH₄ emissions reductions, As and Cd grain uptake, and grain yields.
- Validation of field trace gas analyzer for CH₄ flux measurement
- Automated software (DASIG model) to calculate GHG fluxes using chamber method will be available at GRA PRRG website

A workshop on Carbon and Nitrogen accounting in paddy rice: Data analytics and Reporting (25-29 Aug@IRRI)

Plant Communications
Review article

CellPress
Partner Journal

Advanced technologies for reducing greenhouse gas emissions from rice fields: Is hybrid rice the game changer?

Seyed Mahdi Hosseiniyan Khatibi¹, Maria Arlene Adviento-Borbe², Niña Gracel Dimaano^{1,3}, Ando M. Radanielson¹ and Jauhar Ali^{1,*}

¹International Rice Research Institute, Metro Manila, Philippines

²US Department of Agriculture (USDA) Agricultural Research Service (ARS), USA

³College of Agriculture and Food Science, University of the Philippines Los Baños, Laguna, Philippines

*Correspondence: Jauhar Ali (j.ali@irri.org)

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