GLOBAL RESEARCH ALLIANCE
ON AGRICULTURAL GREENHOUSE GASES

**Integrative Research Group Meeting**

**CREA-RPS Via della Navicella 2-4,**

**Rome, Italy**

19-20 January 2017

# Meeting Report

# OVERVIEW

The first meeting of the Integrative Research Group (IRG) of the Global Research Alliance on Agricultural Greenhouse Gases ("the Alliance") was held at the Council for Agricultural Research and Agricultural Economy Analysis · Research center for the study of relationships between plant and soil (CREA-RPS) in Rome, Italy, 19-20 January 2017. The Alliance meeting was chaired by Canada (Dr Brian McConkey, Agriculture and Agri-Food Canada) and France (Dr Jean-François Soussana, INRA) as Co-Chairs of the Group.

This report is a summary of the key discussions and outcomes of the meeting. PDF's of the presentations are provided separately on the member's area of the Global Research Alliance website.

## PARTICIPANTS

The meeting was attended by 34 participants, representing 16 Alliance member countries, and invited experts.

- **Alliance Members attending:** Australia, Canada, China, France, Ghana, Ireland, Italy, Japan, Netherlands, New Zealand, Norway, Spain, Thailand, United Kingdom, USA, Uruguay.

## MEETING OUTCOMES

The meeting achieved the following outcomes:

- Update from the Alliance Special Representative including outcomes from the latest Council meeting.

- Discussion on Alliance Flagship projects, and the Groups involvement in developing the Soil Carbon Sequestration and Inventory Flagships in particular.
- Presentation on the progress of the Integrative Research Group since its establishment.
- Discussion on the activities and next steps to develop the five Networks of the Group.

# SUMMARY OF DISCUSSIONS

## OPENING REMARKS

1. Participants were welcomed to the CREA offices by Roberta Farina, researcher at CREA. This was followed by short opening words from IRG co-chairs Jean Francois Soussana and Brian McConkey. Participants then introduced themselves to the other participants.

2. Brian McConkey gave an introductory presentation on the IRG and the objectives of the meeting. Key points were as follows:

- The IRG is focused on the integration of issues that are common to and/or cut across the other three Research Groups of the Alliance;
- The IRG is concerned with Measuring, Reporting and Verification (MRV) at all different scales;
- The meeting needs to agree scope, structure and operation of the IRG, and develop its work plan;
- Structure is based on the Livestock Research Group (LRG) model. The IRG consists of co-chairs and member representatives under which are thematic Networks consisting of coordinators and flexible membership that enable specific research and development activities;
- In terms of scope:
    - What are the key areas for network focus?
    - How does the IRG interact with other parts of the Alliance?
- Agree priorities for short and medium term;
- Develop an initial work plan for the IRG and look at resourcing issues;
- Consider the six areas in the Alliance framework diagram from stocktake through to policy support;
- Run through of agenda for the two days.

## UPDATE FROM THE SECRETARIAT

3. Alliance Special Representative Hayden Montgomery provided an update on the Alliance including its background, key achievements over the last 12 months and future direction. Key points were as follows:

- South Africa is the newest member, FONTAGRO the newest partner;
- Alliance has had an inwards focus for the first 5 years, working through the 6 areas of focus for the Research Groups including building capability;
- Some breakthroughs have been made possible and achieved by the Alliance like the Rumen census, and guidelines for measuring agricultural greenhouse gas emissions (GHGs);

- Measuring soil carbon could be an area for future Alliance focus – best practice guidelines for how to do it;
- More recent decisions have looked forward to the next 5 years – decisions to strengthen Research Groups and use the IRG, tri-chairing model for other Research Groups, stronger links between Research Groups and the Council;
- International Research Collaboration Working Group identified the need for a clear articulation of the Alliance's research priorities and this has given rise to the Flagships process highlighting Council ownership of the Alliance's priority research agenda;
- Alliance Strategic Plan agreed in Mexico in October 2016 Council meeting;
- Partnerships becoming more active including in Strategic Plan and Flagships;
- Idea of progressing joint programming within the Alliance including a likely International Research Consortium (IRC) on soils in collaboration with other international initiatives;
- Alliance has established new partnerships with FACCE-JPI and FONTAGRO, is now a 4/1000 member and has applied for IPCC observer status;
- Run through of the Alliance Strategic Plan and priority actions.

4. The development of the Alliance **Flagships** was outlined in some detail:

- Better seen as programmes or themes rather than projects per se;
- Need to have broad relevance and practical application;
- Seen as a way to focus the work of Alliance and Partners;
- Four have been agreed in principle:
    - rice (AWD) production;
    - inventories development and support;
    - enteric fermentation mitigation hub;
    - soil carbon sequestration.
- Nitrous oxide is a potential fifth flagship topic but still under development by Croplands Research Group;
- Task forces are being established for each Flagship – lead authors, contributors, reviewers etc;
- Hoping for near final drafts by April 2017 that can then be supported by Alliance joint programming to be commenced in August 2017.

## GROUP OVERVIEW: SCOPE, GOAL, NETWORKS

5. Jean-Francois Soussana gave a more detailed presentation on the IRG and developments to date with regard to its scope, goal and networks. Key points as follows:

- Post the Paris Agreement: Nationally Determined Contributions (NDC) have changed the focus on agriculture and initiatives like 4/1000 soil carbon consortium are possible, given options to consider carbon sinks in the agreement;
- Big emissions reductions are required from agriculture – we are not on track currently but including improvements in soil organic carbon (SOC) sequestration makes things more 'doable';

- But there is a need for 'integrative' knowledge that combines inputs from different systems and disciplines e.g. economic information;
- Joint sessions have been held with other Research Groups to help develop the scope of IRG;
- 18 countries have joined and 5 research networks have been established;
- A key focus is integration of research findings across different scales – field, farm, regional;
- Networks, complementary to the other Research Groups, described in a bit more detail:
    - Grasslands network looking at practices for soil organic carbon (SOC) management in grasslands, mixed systems, grazing;
    - Soil carbon sequestration network with focus on SOC measurement, SOC sequestration potential
    - Field scale network assessing models (or ensemble of models) for their use in the estimation of GHG emissions, agricultural yields and soil carbon stocks;
    - Farm and regional scale network including demonstration farms;
    - GHG inventories network – uprgarding inventories including moving from Tier 1 to Tier 2 or Tier 3 estimates.
- Highlights of existing work:
    - Grasslands network: Rebuilding SOC in Uruguay while increasing beef production;
    - Field scale network: Modelling examples for SOC and $N_2O$;
    - GHG inventories networks: Inventories improviemtn workshops led by New Zealand and the LRG and stocktaking of current situation and applications of remote sensing; for inventories.
- There are still opportunities for countries to step up and host networks.

6. Discussion and questions highlighted some additional points:

- There is a need to avoid overlap with work of other Research Groups – identify and focus on the gaps and on integration of work e.g. the Field Scale network can take up inputs from all of the Research Groups;
- Networks can benefit greatly from specific projects that can glue them together and that all members can contribute to. It would be helpful to identify such projects, ideally linked to the Flagships;
- Joint calls can be used to advance the research agenda, and commissioned research is another option – there are different approaches and mechanisms;
- Partnerships also important – the research programme of 4/1000 will be directly linked but there are also other groups/partners that can contribute e.g. CGIAR.

## COUNTRY STOCKTAKE

7. Members were given the opportunity to make short presentations on their priority areas in relation to the work programme of the IRG. Members talked to "stocktake" documents that had been submitted in advance. There was strong commonality across the stocktakes – particularly with regard to two key areas of work that fall within the scope of the IRG: measurement of GHGs and improving inventories, including moving from Tier 1 to Tier 2/3 emissions factors; and soil carbon

sequestration including measurement of soil organic carbon (SOC) and best practices for increasing SOC.

8. Jean Francois Soussana thanked members for the useful stocktakes that will be used to help inform the IRG's workplan. The presentations also highlighted the benefits of deliberate communication between members on the research they are doing.

## NETWORK REPORTS

9. Each of the IRG Network coordinators gave an update on progress to date and next steps.

**Soil Carbon network (Denis Angers)**

10. The network is still being finalised and is a work in progress. The relevance of a Soil Organic Carbon Symposium to be held in conjunction with the next World Soil Science Congress in Brazil in 2018 was noted.

11. Key focus areas for the network are quantitative assessment of SOC, analyses of the effects of agricultural practices on SOC stocks, promoting the use of long-term databases for experiments dealing with soil carbon (e.g. drawing on MAGGnet in the Croplands Research Group) and SOC change measurement methodology for grasslands.

12. Key issues being faced are how to mobilise resources and ensure countries' active participation; working out the network's role and contribution to the Alliance flagship on SOC and in relation to the 4/1000 initiative, and linking to the soil carbon work being undertaken by the Livestock Environmental Assessement and Performance Partnership (LEAP).

**Field Scale Network (Fiona Ehrhardt)**

13. This network focusses on modelling carbon and nitrogen cycles in agricultural systems with the aim of assessing model applicability worldwide and improving models and modelling approaches. Key areas include: comparison of models, testing sensitivity of models to climate change, and assessment of mitigation options. Modelling activities were initiated under the *Soil C&N cycles cross-cutting group* and are expanded and consolidated under the IRG with direct links to the work of other Alliance Research Groups and networks.

14. The network shows the potential for reducing simulation uncertainties by using ensembles of models rather than single models. Discussions highlighted the point that the network could facilitate transitions by countries towards adoption of Tier 3 inventories at field, farm and regional scales – a difficult task that is very dependent on the quality of data provided and of models. Grassland modelling will pick up methane from livestock but again, this is very constrained by datasets. The need to look at carbon and nitrogen together, as two sides of the same coin, was also highlighted. A specific need to look at trade-offs of different approaches regarding nitrogen cascades through the chain was highlighted.

**Farm and Regional Integration network (Petr Havlik)**

15. The primary objective of the network is to foster international collaboration in farm to regional scale modelling including via upskilling and holding workshops to exchange ideas. The network hopes to create a link between national and international mitigation options, aiming for global consistency in countries INDCs including with respect to economics, policy and scenarios (Shared Socio Economic Pathways, Representative Carbon Pathways).

16. The network will start with a stocktaking exercise before looking at other areas, including funding. It will model the role of soil carbon for climate change adaptation, long-term changes in yields and the potential for soil carbon sequestration at farm and regional scales, as well as trade-offs with non $CO_2$ greenhouse gas emissions. Reduced complexity models will be explored to include soil carbon in GHG calculators. Regional scale maps of soil carbon changes will be produced, as well as case studies. The network has an ambitious plan to work with stakeholders.

**Inventories Network (Jan Verhagen)**

17. The focus of this network is assisting members and others with improving agricultural inventories to the UNFCCC. This is done through a) sharing and transfer of knowledge regarding emissions factors and relevant activity data including through sub-regional meetings and platforms, b) data management and data flows – governance of data, addressing who's responsible etc, and c) inventory upgrading including development of guidance to countries for moving Tiers with respect to data (including remote sensing data), tools and modelling.

18. The network has found it difficult to find good opportunities to meet in association with other larger meetings but will consider the many UNFCCC/IPCC meetings. The Inventories Flagship will hopefully assist with funding and resourcing for the network.

**Grasslands Network Ken Byrne**

19. There is lots of variation in grasslands globally that the network needs to grapple with. There is currently a project in Uruguay that constitutes a useful case study of the outcomes of implementing changes in practices. Controlled conditions and long-term experiments to determine outcomes over time will be necessary. The Grasslands Network will need to have links to many other Alliance networks, and work with these other groups to define its scope and respective roles, as well as to the CGIAR work on tropical grasslands.

## PARTNER PRESENTATIONS

**CCAFS (Lini Wollenberg, via Skype)**

20. Lini Wollenberg gave a presentation on the work of the CGIAR's climate change and food security programme (CCAFS) via Skype, strongly linked to food security and a range of other relevant SDGs through four cross-cutting programmes: priorities and policies; climate smart technologies and practices; low emissions development (mitigation); and climate services and safety nets.

21. Strong synergies exist with the work of the IRG in areas such as soil carbon ("4/1000" support in Africa and Latin America), MRV for national inventories, and work on integrated systems at landscape level including through 30+ climate smart villages that are used for demonstrations at farm level. Highlights over the last year including global mapping of mitigation obligations, measurement of agroforestry's contribution to climate change and food security, measurement of SOC in improved pastures as compared to degraded pastures, analysis of emission factors for sub-Saharan Africa (actual are much lower than IPCC tier 1 values), suitability mapping for mitigation practices e.g. AWD in South East Asia, and work on highlighting the mitigation co-benefits of development projects.

**FAO's work on Climate Change (Martial Bernoux)**

22. Martial Bernoux presented on the FAO's work on climate change and agriculture and where he sees opportunities to strengthen the partnership between the Alliance and FAO. FAO now has a new Climate Change Strategy and a new department (CB) with two new divisions (CBR and CBL)

focusing on climate change work. The FAO's work on climate change cuts across all the productive systems – fishery, forests, crops, livestock, soils and water.

23. Likely areas for collaboration include work with the FAO Mitigation of Climate Change in Agriculture (MICCA) programme that focusses on improving country capacity to develop and implement NDCs and NAMAs. This includes support for developing and improving inventories – FAO has little capacity to support countries moving from Tier 1 to Tier 2 so there is significant opportunity to collaborate with Alliance on the research side of this work – and support for the FAOSTAT database.

24. In the area of livestock there is already significant collaboration with Alliance members on mitigation potential, emissions intensity, and animal health etc., including through work on the GLEAM tool for livestock emission factors, and in the context of the Livestock Environmental Assessment and Performance Partnership (LEAP). In terms of work on soil, FAO hosts the Global Soil Partnership (GSP) that is working on a Global SOC map (based on National maps) amongst other initiatives, and LEAP is developing guidelines for measuring SOC. FAO will host a Global Symposium on Soil Organic Carbon from 21-23 March 2017 (http://www.fao.org/about/meetings/soil-organic-carbon-symposium/about/en/). .

## WORKPLAN DEVELOPMENT

25. At the end of the first day, two breakout groups convened to identify elements for inclusion in the IRG Workplan. The first group considered this from the supply side – *what can scientists and researchers offer in terms of addressing the core objectives of the IRG* – while the second group considered the demand side – *what are the demands and needs of policy makers and other stakeholders that the IRG could be asked to deliver on*.

26. The outcomes of the two breakout groups were written up by rapporteurs and reported back to the meeting at the start of the second day (attached). Key points and issues that arose in the subsequent discussion included:

- Reminder of the role of GRA, as a way to value on-going research actions and strengthen cooperation amongst researchers;
- The potential use of online tools such as webinars, MOOCs, collaborative platforms (web-based knowledge hub), social networks etc., to foster community work and integrated knowledge;
- Significant interest in including socio-economic factors and considerations including through use of marginal abatement curves (MACs) to look at the costs of implementing specific practices on farm. The Alliance Strategic Plan already provides a mandate to do this work, which also links closely to the work of the 'Regional Network' planning to incorporate economic analysis and modelling. There was discussion of creating a new network on economics. It is important that any economic network be strongly linked to issues and work in the existing IRG networks and in the other Research Groups.
- How best to include livestock related work (also LRG outcomes) and factors in soil work. What exactly is the focus of the Grasslands Network? Is it soil carbon? Is it livestock or is it a crop (feed supplies)? Also links to manure management and potentially ecosystem services. Need to define the activity that brings this network together rather than leaving it to the network to define.

- The relationship between the work of the soil carbon network and the soil carbon flagship was discussed, especially on the modalities of networks – '*how*' they work is as important to consider as '*what*' they work on.
- The relationship between the country stocktakes and the work plan of IRG.
- What are the proxy indicators that the Alliance can develop to help inform people on climate change outcomes of agricultural practices e.g. emissions intensity, carbon balance? Can we identify the carbon balance of different farming practices? C budgeting to link SOC sequestration needs and regional agricultural practices (stocktake/survey on existing practices to be planned through countries contribution);
- Why not considering organic matter and different C pools? Some RG Networks have skills in contributing;
- Innovative methods/practices for improving SOC sequestration and decrease GHG emissions;
- There is a need to go beyond simple inventories to inform policy decisions –disconnection between IPCC methods/inventories and the practical needs of decision-makers making decisions at farm level.
- The IRG could develop a global network of demonstration farms as a resource for researchers, policy makers and farmers.
- Creating a map to visualize the integration of the networks within IRG and with other RG, linked by C & N cycles and spatial scales;

27. The IRG Co-chairs will take account of the outcomes of the Breakout sessions and follow-up discussions when developing the IRG Work Plan.

## CONTRIBUTION TO FLAGSHIP ACTIVITIES

**Soil Carbon Sequestration Flagship**

28. Jean Francois Soussana made introductory comments on current thinking in relation to the Soil Carbon Sequestration Flagship programme. There will be a range of disciplines and a range of agricultural practices covered by the Flagship. While SOC sequestration rates higher than the 4/1000 aspirational target have been observed in some long-term arable field trials this is more difficult to achieve in soils where SOC stocks are already high. There is also a vision of how things could be improved through practices such as the integration of forest and agricultural landscapes, permanent cover on ground etc. Big concerns remain regarding the implications of draining peatlands, particularly tropical peatlands, the impacts of erosion, and of dryland degradation in general.

29. The Flagship programme will involve key partners such as 4/1000, the Global Soil Partnership, FACCE-JPI and others. There is an application being developed for the Collaborative Support Action (CSA) that has been advertised by the EC for supporting research collaboration in this field. The CIRCASA application builds on discussions held in the Alliance IRCWG meeting in Brussels in April 2016, including with the European Commission (EC). One of the elements of the programme will be an online platform as a web-based knowledge hub for sharing collaborative research, supporting national action plans and coordinating funding. The work programme will be broken into modules that different entities can support in different ways.

30. A draft of the Flagship proposal should be ready for review by February and this will aid development of an associated budget and timeline. Final review and submission is in April. There will

be a need to consider both in-kind and financial contributions as well as tapping into existing funding arrangements including for developing countries (CGIAR, Feed the Future (USAID)).

**Inventories Flagship**

31. Brian McConkey introduced this Flagship. He and Andrea Pickering from New Zealand are the lead authors of this Flagship proposal. Attracting resources will be a challenge and they envisage a "pick and mix approach" for donors. Inventories are a combination of activity data (95%) and emissions factors (5%).

32. Discussions highlighted a number of points:

- The Flagship could kick off straight away with a stocktake of what inventories countries are using, what factors, and what support do they need? This would help identify needs, demand and assists with activity data (a useful Network activity that could be initiated immediately to support the Flagship).
- Two components of inventory work: science side and inventory compilers. Alliance assistance is best delivered on the science side.
- FAO and others have programmes to assist countries with development of Tier 1 inventories. Alliance can assist with upgrading to Tier 2.
- Need to convince authorities of benefits of moving to Tier 2, particularly Ministries and funding agencies – need to articulate the policy benefits. Involve those that head research funding and planning agencies. Show them the benefits.
- Activity data is critical – assistance to support countries gather relevant data and give them the confidence to progress, even with imperfect data.
- Share experiences with development of emissions factors.
- Regional research and training programmes including in measurement techniques – external funding to support in-kind support from the local countries.
- Put emphasis on generating and sharing activity data. Also use of remote sensing data for reviewing land use.

## NEXT STEPS AND MEETING CLOSE

33. The Co-chairs thanked participants for the excellent sessions, particularly the identification of immediate stocktaking exercises that can be undertaken which will further inform what needs to be done next. Tasks can then be refined to complement other existing initiatives. Flagship Plans will be sent to the Alliance Council and could be shared with partners such as FAO, and especially GSP regional and general assemblies.

34. Co-chairs of the Livestock and Paddy Rice Research Groups both thanked the IRG Co-chairs for the opportunity to participate in the meeting and emphasised the importance of ongoing engagement in the work programme of the IRG by all of the Alliance Research Groups.

35. Japan announced that it will host the next Alliance Council meeting in the last week of August (28 August – 1 September 2017).

## APPENDIX 1: Participants List

| Country | Attendees |
|---|---|
| **Alliance Member Countries** | |
| Australia | Jeff Baldock: CSIRO (jeff.baldock@csiro.au) |
| Canada | Denis Angers: Agriculture & Agri-Food Canada (Denis.angers@agr.gc.ca) |
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| Uruguay | Walter Oyhantcabal: Ministry of Livestock, Agriculture & Fisheries (woyhantcabal@gmail.com) |
| **Networks** | |

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|---|---|
| **Networks** | |
| Farm Regional Scale | Petr Havlik (havlik.petr@gmail.com) |
| **Partners** | |
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| **Co-Chairs** | |
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| LRG | Harry Clark: New Zealand Agricultural Greenhouse Gas Research Centre (harry.clark@nzagrc.org.nz) |
| PRRG | Kazuyuki Yagi: NIAES (kyagi@affrc.go.jp) |
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