

Integrative Research Group Meeting

17 January - Amphitheatre 110, INRA, 147 rue de l'Université; 18 January - Room Colonne, La Maison des Polytechniciens, 12 rue de Poitiers, Paris, France

17-18 January 2018

Meeting Report

OVERVIEW

The second meeting of the Integrative Research Group (IRG) of the Global Research Alliance on Agricultural Greenhouse Gases ("the Alliance") was held in Paris, France at Institut National de la Recherche Agronomique (INRA) on 17 January and La Maison des Polytechniciens, on 18 January 2018. The Alliance meeting was chaired by France (Dr Jean-François Soussana, INRA), and Canada (Dr Brian McConkey, Agriculture and Agri-Food Canada) as Co-Chairs of the Group, noting that apologies were received from Robyn Johnston, Co-Chair (ACIAR, Australia).

This report is a summary of the key discussions and outcomes of the meeting. PDF's of the presentations can be downloaded from the resource library on the Alliance website

PARTICIPANTS

The meeting was attended by 34 participants, representing 14 Alliance member countries, and invited experts.

- **Alliance Members attending:** Australia, Canada, Denmark, France, Germany, Japan, Netherlands, New Zealand, Norway, Spain, Sweden, United Kingdom, USA, Uruguay.
- **Invited Experts:** ISRIC

MEETING OUTCOMES

The meeting achieved the following outcomes:

- Grassland Network integrated into the Soil Carbon Sequestration (SCS) Network.
- Priority activities identified for the SCS and Agricultural greenhouse gas (GHG) Inventory Flagships.
- Agreement on how to coordinate the activities of the Networks and Flagships within the IRG.
- Decision to develop a group communication plan and share activities more widely.

SUMMARY OF DISCUSSIONS

GROUP OVERVIEW

1. The meeting was opened by Dr Jean-François Soussana, Co-Chair of the Integrative Research Group (IRG) who welcomed all participants to INRA and the second meeting of the IRG.
2. The IRG held its first meeting January 2017 in Rome, Italy where it established five Networks; grasslands, soil carbon sequestration (SCS), field scale modelling, farm to regional modelling, and inventories, which all work together to scale up activities. The IRG also provides leadership for two Flagships on Soil Carbon Sequestration and Agricultural Greenhouse Gas (GHG) Inventories.
3. The main ambition of the IRG is to facilitate the use of research to improve estimation and reporting of options for SCS and reduce the GHG emissions intensity of agricultural production. A discussion for this meeting was how the IRG supports upscaling of soil carbon and GHG emissions data through model improvements and the improved inventories for countries to demonstrate their Nationally Determined Contributions (NDC's).

SECRETARIAT UPDATE

4. The Alliance Secretariat provided an update to the Group on activities of the Alliance since the 2017 Council meeting, including new Members and Partners and the changes to Research Group pages on the Alliance website.
5. The Alliance now has 49 Member Countries, with Senegal, South Africa and Zimbabwe joining in the past year. The Alliance has the will to identify every country that support activities related to Research Groups' subjects. The Alliance now works with 14 Partner organisations.
6. Outcomes from the Council meeting that are of relevance to the Research Group include the decision to complete an inventory of Members capability building needs, and fellowships and training events that could be used to support Alliance activities. The Research Group Co-Chairs also proposed developing regional capability building activities, which will be coordinated across all four Research Groups. This would make the benefit received from these activities, for the Alliance and institutes and researchers attending, more visible. Council members have been asked to support these activities by identifying experts that could help to develop workshop programmes and deliver the workshops.
7. Recent updates to the Alliance website had provided additional space for each of the four Research Groups to showcase activities and the work of their Networks. The Group and Networks were encouraged to review the website, and provide updates on activities as well as any documents and overviews of group activities to the Secretariat for uploading to the website.
8. The Alliance council endorsed development of four Flagships : Soil Carbon Sequestration, Enteric Fermentation, Agricultural Greenhouse Gas Inventory and Water Management in Rice Production.

GROUP PRIORITIES

9. In 2017, IRG members completed a stocktake of priorities that helped to develop the Group workplan. An overview and analysis of this completed stocktake was presented by Dr Brian McConkey. The stocktake identified a number of priorities for the group to consider across all activities, including sharing knowledge, experiences and data, as well as building capability and increasing collaboration opportunities (including with other global initiatives).
10. The stocktake also identified priority activities related to SOC sequestration and agricultural GHG inventory, which could support/become part of the two Flagships led by the Group. Soil carbon

priorities included better understanding of the potential for sequestration of carbon in agricultural soils, considering different contexts (e.g. soil types, farm systems and management practices) as well as identifying the best management practices by country. Priorities for inventory were considered to be improving inventories to Tier 2 and 3, developing emission factors, methodologies and activity data. One of the desired outcomes of the two Flagships is to ensure that farmer as change agent on the ground is not forgotten. The Flagships provide the means for the IRG to address the priorities identified and to identify the resources required to develop activities.

11. Capability building will need to be a large part the Group's focus to address the priorities mentioned above, countries are asked to identify experts that are able to support training activities. The survey also indicated that many countries have a strong interest in understanding SCS and methodologies to help validate their NDCs, the goals of the IRG have been developed to meet these needs.

12. The Group agreed that information about the IRG and its current priorities for collaborative activities should be communicated to the United Nations Framework Convention on Climate Change (UNFCCC) focal points from each member country to make sure that climate change focal points are aware of the Alliance and to gain further input on country priorities relevant to the IRG.

FLAGSHIP ACTIVITIES

Agricultural Greenhouse Gas Inventory Flagship

13. The Flagship has four components:

1. Enhance inventory structure.
2. Building capability
3. Acquisition and administration of data
4. Support for NDCs

14. The Flagship taskforce, comprising of Alliance Members and Partners, identified an initial set of nine projects for the Flagship. However, none of the projects have yet nominated a project lead or the resources to further develop the activity. To progress these activities the support of inventory practitioners will be required, and the challenge is to ensure these contacts are aware of the Flagship.

15. The next step will be for the Inventory Network and the Flagship co-leads to select one or two projects that can be progressed; there was agreement that the Flagship project concept on analogous production systems is one that should be initiated if possible

16. The Group noted that the other Flagships have chosen an initial set of projects based on existing research or activities that can be expanded by the Alliance. Supporting the easy wins could be a way to encourage involvement in other activities. Activities of the Flagship need to be relevant to a broad range of member countries. The creation of bottom-up inventories which aggregate data from the farm level to national level was suggested as a further work area (more indicators for a lower cost). Australia (Dairy Base), New Zealand (Overseer) and the UK (Farm Scoper) have the ability to collect data on farm and reconcile this with the national inventory.

17. The Group also discussed the need for inventories to be improved so that they are able to reflect mitigation options, Tier 1 inventories do not allow for this and higher Tier inventories need to reflect on-farm practices to capture this. The UK agricultural inventory now has the ability to reflect over 30 mitigation measures with implicit calculation and the UK would be willing to share information and expertise in this area.

Soil Carbon Sequestration Flagship

18. The Soil Carbon Sequestration (SCS) Flagship components focus on developing a decision support toolbox, adopting methods that certify SCS and creating an enabling environment for the implementation of sequestration practices.

19. The Flagship aims to understand the SCS potential at an almost global scale for arable and grasslands systems – with countries providing the underpinning data. A number of partners and initiatives will be involved in Flagship activities such as the Global Soil Partnership (GSP) to develop methodologies and guidelines, cooperation of Alliance members and others for the adoption of solutions and the project “Coordination of International Research Cooperation on SCS in Agriculture” (CIRCASA) to develop the online pilot knowledge information system. To be most effective the Flagship will work at two different scales – the global scale through the 4 per 1000 - Soils for Food Security and Climate (4/1000) initiative and regional projects which are able to assess practices.

Coordination of International Research Cooperation on SCS in Agriculture (CIRCASA)

20. The CIRCASA project, funded by the European Commission and coordinated by INRA, aims to coordinate and improve the international research cooperation in the field of agricultural soil carbon sequestration like creating international synergies, strengthening the international research community, improving understanding of soil carbon sequestration, strengthening the research agenda and creating an International Research Consortium. The key activity is the development of an online collaborative research platform, which allows partners to share knowledge and experiences as well as research results and coordinate research collaborations.

21. Contributing to the CIRCASA project are 24 partners from 17 countries and a number of associated partners including the Alliance, CGIAR, Global Soils Partnership, 4 per 1000 - Soils for Food Security and Climate and the EU Joint Programming Initiative on Food Security, Agriculture and Climate Change (FACCE-JPI). Non-partner organizations and countries can be invited to contribute to CIRCASA through the organization of regional workshops.

22. There are a number of links between CIRCASA and the Soil Carbon Sequestration Flagship as well as opportunities for countries to contribute to collaborative research efforts and align national research activities on soil carbon sequestration with other CIRCASA partners.

NETWORK PRESENTATIONS

Field-Scale

23. The Field-Scale Network is led by Jean-Francois Soussana, France, and Pete Smith, UK. The Network aims to develop a better understanding of the GHG emissions processes through models and understand the applicability, improvements, and performance of model ensembles. Network activities are:

- Comparison of 24 models for simulating yield, GHG emissions and soil carbon.
- Testing the sensitivity of models to climate change, in partnership with AgMIP.
- Comparison of soil models using long term bare fallow sites, in collaboration with the soil carbon network.
- Testing models and model limitations for their ability to model mitigation options.

Farm to Regional Scale

24. The Farm to Regional Scale Network, led by Richard Eckard, Australia, and Petr Havlik, Austria, met for the first time ahead of the IRG meeting to establish the Network and its activities. The Networks objectives are to coordinate research and increase collaboration opportunities. There

is a need to identify and upskill the next generation of modellers by identifying opportunities for capacity building workshops/meetings and sharing of data, models and research.

25. The next steps for the Group:

- engage developing countries more;
- complete a stocktake of models and tools at the farm level and across the production cycle;
- populate the Global Research Alliance Modelling Platform (GRAMP);
- modelling to help countries underpin/monitor NDCs;
- stakeholder involvement;
- consider evaluation methodologies; and
- integration of economics into biophysical models.

Soil Carbon Sequestration

26. The Soil Carbon Sequestration (SCS) Network led by Denis Angers, Canada, and Claire Chenu, France, has yet to hold a meeting or develop a work plan. The Network will be involved in two activities at the World Congress on Soil Science held August 2018 in Rio de Janeiro - participating in a panel on 4/1000 and involved in a session on soil carbon effects on yield. The network will contribute to and be aligned with the priorities of the SCS Flagship.

27. Norway has offered to hold the first meeting of the Network, to identify where the Network is best placed to contribute and links to other similar organisations e.g. CIRCASA, 4/1000, SCS Flagship. Research institutions and networks from developing countries have shown an interest in joining this group (e.g CAsa in Africa).

Greenhouse Gas Inventories

28. The Greenhouse Gas Inventories Network is led by Jan Verhagen, The Netherlands, Brian McConkey, Canada, and Andrea Pickering, New Zealand. The main focus of the Network is how to improve national GHG inventories by moving to higher tier inventories. Network activities are moving towards policy and assisting countries to improve their agricultural inventory. Priority activities for the Network are:

- Guidance to improve inventories.
- Examples of how to move to higher tier inventories.
- Emission factors and activity data for farming systems.
- Development of the Inventory Flagship.
- Institutional capacity - support for countries to set up an inventory including data management systems.
- Inventory training course.
- Support for UNFCCC regional training workshops.
- New Zealand is inviting four developing countries to learn from the agricultural inventory team.

Grasslands

29. The Grasslands Network has been led by Fernando Lattanzi, Uruguay. Although the Network has not been active it continues to have many interested members, although not many in Africa and Asia. In 2015 the Network agreed to focus on soil carbon issues, and shifted from the Livestock Research Group when the Integrative Research Group was established. This Network will now be included in the SCS network, and it will form the grassland component of the Soil Carbon Sequestration flagship.

30. Activities of the Network include:

- Developed a proposal on win-win scenarios for improving degraded grasslands in Uruguay – still waiting for a response from this submission.
- Involved in the forage legume project with 8 countries from Latin America, funded by Fontagro and Procisur.
- Participate in the FAO Livestock Environmental Assessment and Performance (LEAP) partnership advisory groups, guidelines for measuring soil organic carbon (SOC) stocks.

COUNTRY REPORTS

31. Country representatives provided the group with an overview of the NDC's of their country to assess any opportunities for collaboration across the Alliance. Representatives also provided an overview of activities that each country contributes to the Group.

Australia

32. Australia has committed to reduce 26-28% of emissions below 2005 by 2030 and is not currently on track to meet this commitment. A decrease in land clearing has been responsible for reducing emissions in the past. However, it is likely that agriculture may need to play a role in accelerating future emissions reductions.

33. Australia is now represented in the Alliance by the Australian Centre for International Agricultural Research (ACIAR), which have a number of climate change and agricultural development projects in the Pacific, Asia and Africa. A recent project is looking at emission reduction options for NDCs in the Asia-Pacific region.

34. Moja Global (moja.global) is an activity of interest for the Group. The platform provides tools for estimating emissions and removals of GHGs from the land sector. The software is open source for use in monitoring NDCs.

Canada

35. Canada is the Co-Chair of the IRG and the SCS, Farm to Regional and Inventory Networks. A new funding mechanism allows for aligned projects in Canada to be linked to Alliance activities.

36. Canada has committed to reduce 30% of GHG emissions from 2005 by 2030. Although agricultural reductions do not make up a large part of that commitment, biofuel from agricultural feedstocks will be the largest contribution.

37. Opportunities for collaboration in the IRG include reporting on increasing soil carbon sequestration in agricultural lands. Grasslands soil carbon is not estimated in the Canadian inventory as there is no data. Collaboration with other countries is required to understand what the processes are and what management practices are likely to increase soil carbon. There is a unique opportunity for the Alliance to provide this information, as international acceptance of reporting in national inventories is essential.

Denmark

38. Denmark has not had a strong research focus on agricultural GHGs, and have only recently begun thinking about this. Agricultural emissions account for 40% of non-Emissions Trading Scheme sector emissions, this will need to be reduced to meet targets. Policy measures are also under consideration, such as rewetting drained wetlands and the use of anaerobic digesters.

France

39. France contributes to the IRG as Co-Chair and is also co-leading the Field Scale and SCS Networks and the SCS Flagship. In the wider Alliance France participates in the Croplands and Livestock Research Groups.

40. France is hosting the 4/1000 research programme, and completing a national study to test the 4/1000 target and barriers to adoption. Other international networks that France contributes to:

- FACCE-JPI –participating in several European Research Area Networks (ERA-NETS) and EU Thematic Annual Programming (TAP) on soil.
- CIRCASA – leading this EC supported international coordination and support action.
- European joint programming on soils, agricultural soils under climate change.

41. The French NDC is nested into the EU NDC. Carbon storage in agricultural soils is now an option for reducing total emissions, which has led to increased policy interest in practices to increase soil carbon.

Japan

42. Japan is the current Chair of the Alliance Council and held a successful meeting in Japan 29-30 August 2017. Japan's main focus is the Paddy Rice Research, which they co-Chair, and the MIRSA project (Mitigation in Irrigated Rice Systems in Asia). The next stage of the MIRSA project has links to increasing soil carbon.

43. Opportunities for the group include an Asian network of long term field experiments, which has sites from 3-4 countries so far <http://www.naro.affrc.go.jp/english/niaes/alter/index.html>. Also the development of a Global Long Term Experiment Network (GLTN), which is coordinated by Rothamsted Research, UK. A conference is planned for May 2018 - <http://www.cvent.com/events/the-future-of-long-term-experiments-in-agricultural-science/event-summary-e79ef68cafcb4598b5bd20355a43d0dc.aspx>

New Zealand

44. New Zealand's current target is to reduce GHG emissions by 30% below 2005 levels by 2030. The livestock sector is continuing to grow and soil carbon has not been accounted for as historically the country has high soil carbon levels. New Zealand is considering possible soil accounting methods and management practice that would change soil carbon stocks, aiming to prevent the decrease of stocks rather than increase. Current research is developing methods for the rapid assessment of soil carbon stocks, making measurement less expensive, which would be a major contribution to the IRG.

45. New Zealand is co-lead of the Inventories Network and is continuing to work on improving agricultural inventories. Historically this has mostly been through the LRG and in collaboration with CCAFS in developing countries. Activities include the development of guidelines, case studies and one to one support for countries looking to improve their livestock inventory.

46. New Zealand is involved in 4/1000 and other soil carbon initiatives. However, as a small country it is difficult to resource all initiatives.

Norway

47. Norway aims to reduce 40% of GHG emissions by 2030 compared to 1990 level and faces a number of challenges to reduce its agricultural emissions. Agricultural land to producing annual crops is already small – so land use change is not an option. No-till practices are also not feasible in the cold and wet climate, and mature forests decrease the rate of SCS possible.

48. Norway research relevant to the IRG is the measurement of carbon sequestration under Norwegian pastures. Norway is also contributing to the following activities:

- Project on carbon storage in Norwegian soil
- Carbon storage in short and long term grasslands
- Tier 3 inventory development for SOC stock change
- Carbon storage in organic soils

- Biochar fertilisation (2 projects)
- SOC management working group, producing a technical manual
- Livestock Environmental Assessment and Performance (LEAP)
- EU Joint Programming Initiative (JPI) – Thematic Annual Programming (TAP) soil

49. Norway would be interested in organising a workshop for the SCS Network.

Spain

50. Spain's involvement in the Alliance is now coordinated through the National Institute for Agricultural and Food Research and Technology (INIA). Spain currently has 15 national projects on GHG mitigation, contributes to three projects under the FACCE-JPI and is involved in 4/1000.

51. Other opportunities for the IRG include:

- Spanish scientific network on GHG mitigation in agroforestry
- Remedia network
 - Remedia research networks - crops, forestry, livestock, GHG Inventories and socio-economic.
 - Next Remedia workshop April 2018 in Granada, Spain.
 - Running master courses – mostly for Mediterranean countries.
 - Webinars and MOOC

52. Spain has an interest in collaborating with a specific focus on Mediterranean climates.

Sweden

53. Sweden has recently completed a systematic review, published by the Mistra Council for evidence based environmental management, which analysed soil carbon changes in agricultural management for boreo-temperate regions. The review provides a map and reviews all published literature that looked at soil carbon changes in agriculture management for boreo-temperate regions.

54. The work is ongoing to conduct meta-analysis of specific management practices such as tillage, selected crop rotations, rotation vs monoculture, use of legumes etc. The group are interested in completing similar analysis on tropical systems, but have not identified the funding to complete this work, it could be that Alliance members could contribute to this systemic analysis.

United Kingdom

55. The UK manages five year carbon budgets, and is expecting that agricultural emissions will grow in proportion as other sectors are able to decarbonise. Agricultural emissions are currently 10% of the UK's total emissions.

56. Priority areas of research include:

- management practices to reduce soil carbon losses and maintain production;
- developing a soil health metric;
- understanding measures and implementation costs for uptake of non-CO₂ mitigation; and
- development of a new UK agricultural inventory model (latest inventory submitted has used the new model). The data is available to be shared. The UK is also able to share their experiences of shifting to a high tier inventory, and including mitigation measures in inventories.

57. Research collaborations of interest to the IRG:

- Extension of European ERA-NET projects
 - Rumen predict, UK have increased resources to improve collaboration with the Alliance

- Residue gas, producing guidance on N₂O emissions from residues
- Workshop funding available, to include Alliance participants
- Developing a further co-funded call with ERA-NET partners
- GRAMP – available for the Group to make use of.

USA

58. The USA has a number of opportunities available for fellowships and research collaboration, such as funding provided by the carbon cycle science inter-agency working group (CCSWG) and annual Borlaug fellowships, in support of the Alliance. The complete list of opportunities is provided in the presentation.

59. US activities that could contribute to the IRG and Flagships:

- *Dear Colleague letter*, aim to encourage convergent research that advances understanding dynamic underground processes via advances in sensor systems and dynamic models.
- Partnerships for Enhanced Engagement in Research (PEER).
- Supplements for international engagement.
- Soil Organic Matter (SOM) Data Synthesis and Visualization Working Group.
- Networks for synthesis and data management (NIFA) and Research Coordination Networks (NSF).

60. Suggestions for potential partners include the international soil carbon network, North American carbon assessment, regional climate hubs, LTAR (long term agricultural research centres) system, and soil health initiative.

Uruguay

61. Uruguay's NDC included SCS as an option to reduce emissions. A discussion has been held to identify the data that will be required to monitor soil carbon stocks. An area for additional research identified was understanding the change in soil carbon stocks depending on management practices for grazing systems (natural and pasture grasslands).

62. Latin America is able to coordinate post-docs and others that would be able to undertake meta-analysis of grey literature for the region. This would contribute to global IRG activities where more data is required but is not available in peer reviewed journals.

63. As a direct result of participation in the Alliance, Uruguay is contributing to a forage legume project in collaboration with 7 other countries supported by regional research funders Fontagro and Procisur. The project aims to reduce GHG emissions, improve production, reduce nitrogen and increase soil carbon. The Alliance was used to expand the project to include additional measurements.

OTHER INITIATIVES

4/1000

64. The 4/1000 initiative on SCS was presented to the Group by Dr Paloma Melgarejo, as Secretariat of the 4/1000 scientific and technical committee. The Secretariat is funded by France and supports the consortium of stakeholders as well as the scientific and technical committee.

65. At COP23, the 4/1000 research programme was approved and focuses on four main pillars. The role of the scientific and technical committee is to provide advice to consortium members that improves the outcomes of projects. Projects are evaluated against a set of high-level indicators that are based on the UN Sustainable Development Goals (SDG). The new method will provide a comprehensive evaluation of each project that supports the goals of 4/1000. Each project will be

evaluated by the scientific and technical committee against four sets of criteria - safeguards, direct references, indirect references and cross cutting.

Impact with monitoring inventories and evaluation

66. The Netherlands Council Representative, Sjoerd Croqué, Ministry of Agriculture, Nature and Food Quality, presented a new programme led by the World Bank in partnership with UN Statistical Division that provides countries with a frame work for coordinating and collecting data that can be used across agencies. Wealth Accounting and Valuation of Ecosystem Services (WAVES) is a system to promote sustainable development by ensuring that natural resources are considered in the development planning of national economic accounting. WAVES will support countries trying to integrate information on resource use, environment, and economic activities into a national accounting system.

67. The Netherlands sees value in strengthening WAVES with input from the Alliance on GHG inventories data sources and requirements as well as ongoing monitoring. If the Alliance is interested the Netherlands would be willing to organise a pilot workshop to develop the idea further.

68. The Group agreed that if a framework already exists, and will be used by organisations such as the World Bank for their own activities, then it makes sense for the Alliance to make use of it. The Inventories Flagship may also be improved by the cross-over of agricultural and economics data.

69. INRA has been tasked to develop the ecosystem services from agriculture for this system, and noted that the Alliance would only be able to influence a small part of the programme.

70. Members were asked to contact country representatives and inventory experts to identify support for this activity.

GROUP STRUCTURE AND COMMUNICATIONS

71. The Group discussed how to coordinate activities across the Networks and Flagships, and also ways to encourage participation and increase funding within the Group.

Networks and Flagships

72. The IRG is responsible for leading the development of the Inventories Flagship and the SCS Flagship. The discussion focussed on what the difference is between the Flagships and the Networks of the same name, especially given that the Networks have agreed to focus on the development of Flagship activities.

73. The role of a Network is to identify research collaborations and share information and experiences with members, while extending the network beyond the Alliance. Flagships should deliver specific projects that are supported by the Alliance, the various Flagship projects should involve participants from other Research Groups and Networks.

74. The Co-Chairs proposed that the SCS Network has a priority to further projects within the SCS Flagship, and that the Inventory Network focuses on projects to support the Agricultural Greenhouse Gas Inventory Flagship. The intention is that the Networks will contribute to the coordination of the Flagship activities, and help to identify the leadership and funding opportunities to take the flagship projects forward. A number of projects have so far been identified for each of these Flagships, but these will not go ahead until a leader has been identified.

Grasslands Network

75. The Co-Chairs suggested that the Grasslands Network may be better located within the SCS Network. The Grasslands Network has soil carbon as a focus, and has had trouble identifying specific

activities and funding to develop the Network. Grasslands experts will still need to contribute to all other IRG Networks.

76. The Group agreed that the Grasslands topic still fit well with the IRG priorities, and that including this topic within the SCS Network could simplify the number of groups that soil carbon and grasslands experts would need to participate in. It was noted that by not having a group dedicated to grasslands systems, the Alliance may miss opportunities to share our expertise on this topic. However, the grasslands experts and members of the SCS Network will still be able to develop proposals specific to grassland systems and collaborate with partners on this topic, and are also able to include more general soil carbon experts. Further, the new Farm-to-Region Network involves much expertise on modelling livestock systems that include grasslands as an important component. So grassland experts will also be able to work on modelling projects involving grassland-livestock systems through that Network.

Regional Activities

77. Based on the success of the forage legume proposal funded in Latin America, the Group discussed the opportunities for developing other regionally funded projects. Regional projects could then be used as a base for wider international collaboration. International research projects funded by research call and grants may be more methodological such as comparison on data and samples and methods.

78. Regional projects may also be a way to increase active participation in developing countries, especially if they focus on specific concerns or common systems, such as building capacity for MRV, agricultural GHG inventory and NDCs.

79. The group was encouraged to make use of regional funding such as Fontagro in Latin America or FACCE-JPI in Europe, and then consider the opportunity to extend and connect regional projects globally through the Alliance.

Communication

80. Communicating the aims and activities of the IRG to researchers, policy makers and to the rest of the Alliance is an important part of the Group. The Group and the Networks need to improve the material already on the Alliance website, and now have an opportunity to expand on this, with separate pages for each network and the ability to show case activities. The ACIAR communications group have offered to help develop a strategy for the IRG and a social media presence.

81. Within the IRG the Co-Chairs will continue to hold regular calls with the Network co-leads, rotating calls between the Flagships and the Networks.

82. A further suggestion was to develop a template format for project proposals to help identify the opportunity, funding sources, participants and outcomes etc.

OUTCOMES

83. The Group discussed a number of outcomes and activities that had been mentioned over the one and a half day meeting and identified the Countries responsible for leading the activity. Each project topic lead is expected to develop a 1-2 page proposal for the project including potential funders and participants as well as expected outcomes and end-products.

Soil Carbon Sequestration Flagship and Soil Carbon Sequestration Network

- Proposal development identifying funding opportunities and partners [**Action: Co-Chairs and all IRG**].
- Systematic review of management practices on soil carbon [**Action: Sweden, UK, USA, Spain, Canada, France**].

- Economics of SCS, typology of activities and barriers **[Action: IIASA, Australia, UK, USA]**.
- Survey of long term experiment sites that may have soil carbon data, identify where the IRG could add value. A number of organisations and projects were identified that are already undertaking these types of activities:
 - Analysis of soil carbon from long term experiments (LTAR, ANAEE).
 - Standardising soil carbon data linked to management practices (including MAGGnet).
 - Global Long Term Experiment Network (GLTEN project) at Rothamsted Research.
 - ISRIC for hosting long term data.
- Rapid assessment of indirect methodologies for soil carbon stock change **[Action: New Zealand, USA, Australia, Canada]**.
- Soil microbiome and the implications for soil health **[Action: USA, Canada]**.
- Workshop on carbon offset methods to bring together different initiatives **[Action: France, Australia]**.
- Novel sequestration options e.g. biochar (for later consideration).
- Consider organic soils (Peatlands) activities of the Croplands Research Group in the Flagships. **[Action: Flagship Leaders and the Peatlands Network of the CRG]**.

Field scale Network

- Comparison of models for simulating yield and soil carbon.
- Testing the sensitivity of models to climate change, in partnership with AgMIP.
- Comparison of soil models using long-term bare fallow sites, in collaboration with the Soil carbon network.
- Testing models and model limitations for their ability to model crop and grassland mitigation options.

The network will follow-up on these research actions which already have produced a series of peer-reviewed papers in international journals.

Farm to Regional Network

- Global modelling of land degradation, climate change, land use change and NDCs, to be completed as part of the CIRCASA project.
- Identify farms where there is adequate collection of data to validate models or a library of case studies sharing minimum data requirements. Project scope and IRG added value identified **[Action: Canada]**.
- Training and capability building activities, training the next generation of modellers **[Action: New Zealand, USA]**.

Inventories Flagship and Inventories Network

- Bottom up inventories feasibility and comparison with traditional top-down approach.
- Shared farm/production system typologies **[Action: CCAFS, Inventory Network]**.
- Reduced complexity of models, including soil carbon **[Action: field scale Network]**
- GRAMP for Tier 3 inventory, using model ensembles **[Action: UK, all modellers]**.
- Representing mitigation options in higher tier methodologies.

Other activities

- Distribute information about the IRG and its current priorities for collaborative activities to UNFCCC focal points for each member country – inform council of this action **[Action: IRG Co-Chairs and Secretariat]**.
- Soil Carbon database and links to activities **[Action: ISRIC to help coordinate]**.

APPENDIX 1: Participants List

Country	Attendees	
Alliance Member Countries		
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