

# GLOBAL RESEARCH ALLIANCE

ON AGRICULTURAL GREENHOUSE GASES

8<sup>th</sup> Livestock Research Group meeting

19-20 February 2016



**WELCOME**

# Setting the scene: overview

- **Looking back:** LRG achievements in 2015
- Outcomes from the GRA Council meeting
- **Looking forward:** challenges and opportunities for the LRG
- Other updates, e.g. regional progress



# REDUCING THE EMISSIONS INTENSITY OF LIVESTOCK PRODUCTION: CASE STUDIES OF SUCCESS

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## INDONESIA

### Dietary changes to improve beef productivity in Bantul, Indonesia

Over a period of three years, smallholder farmers near the city of Bantul in the Yogyakarta province of Indonesia have introduced new management practices and technologies, including leguminous tree fodder crops, to significantly improve beef cattle productivity and reduce emissions intensity.

### Background

Beef cattle production near Bantul in the province of Yogyakarta is largely small-scale and is a secondary activity to paddy rice cultivation. Farmers own around 2-4 heads each, used mainly for local meat production. Bantul farmers formed the Ngudi Mulyo Farmer's Organisation (NMFO) in 2011 and now house their animals in a communal facility owned by the NMFO. Animals were being fed a diet of rice straw and rice bran – by-products of rice harvesting. Fluctuating feed supply (less available during the dry season) and feed quality (deteriorating as it dries out after harvest) was severely impacting animal productivity with low fertility rates affecting the long-term sustainability of the herd.



### Key actions & their effects on productivity, income & food security

In 2012, the NMFO began receiving training and assistance from researchers and extension staff at BPTP Yogyakarta (Assessment Institute for Agricultural Technology) to help improve productivity. A range of different management practices and technologies were introduced.

Farmers were shown new techniques (chopping and fermentation) for processing the rice straw and bran that makes up the bulk of the animals' diet, and were also taught how to use concentrates and additives to balance nutrient levels. 'Jamu Ternak' is a traditional Indonesian feed additive comprising herbs, garlic and

probiotics. The ingredients differ from region to region depending on availability of local herbs. Some farmers also add honey and even eggs.

Four legume tree species were introduced as a high protein feed supplement to the cattle's diet – Gliricidia, Indigofera, Leucaena and Calliandra. These trees grow widely throughout Indonesia's highlands including the local area and are mostly evergreen although leaf production decreases during the dry season. The legume trees were introduced at no more than 50% of the animals daily diet, with a period required to allow the animals to adjust to the addition.

The results on productivity were dramatic with significant increases in fertility rates, birth weights and overall animal health (refer to tables 1 and 2). This meant that the village not only became self sufficient in terms of its own supply needs but was able to sell surplus calves at a higher price than prior to receiving the BPTP training resulting in increased income for farmers.

Table 2: breeding improvements

| Year | Cows | Calves | Fattening | Total |
|------|------|--------|-----------|-------|
| 2011 | 68   | 0      | 0         | 68    |
| 2012 | 68   | 18     | 0         | 86    |
| 2013 | 68   | 27     | 12        | 107   |
| 2014 | 68   | 42     | 10        | 120   |

Table 1: main changes made by NMFO farmers

| Year                       | Year 2011- 2012                       | Year 2013- 2014  |
|----------------------------|---------------------------------------|--|
| Feed type                  | Rice straw, grass, concentrate        | Rice straw, grass, leguminous, concentrate   |
| Increase feeding frequency | Rice straw as the main feed           | Balance among rice straw, grass and leguminous. Concentrate offered 2% of DM before cows delivery program started from 2 mo before delivery the baby until 2 mo of lactating period. |
| Feeding strategy           | Rice straw and grass were not chopped | Fermentation of rice straw, grass and leguminous   |
| Birth weight               | 24.0 kg (year 2012)                   | 24.3 kg (year 2013); 26.58 (year 2014)   |
| Calf Crop                  | 24.5% (year 2012)                     | 39.70% (year 2013); 41.74% (year 2014)   |

Scale: Local  
System: Housed  
Sector: Beef

# Livestock Research Group

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### What is the Global Research Alliance?

Agriculture has a vital role to play in the coming decades with the world's population estimated to reach 9.6 billion by 2050. With more mouths to feed but limited natural resources to draw on, the sector must find ways to produce more food and fibre more sustainably, while also contributing to broader development goals.

The Global Research Alliance (GRA) seeks to increase cooperation and investment in research activities to help reduce the emissions intensity of agricultural production systems and increase their potential for soil carbon sequestration, and improve their efficiency, productivity, resilience, and adaptive capacity. This contributes in a sustainable way to overall mitigation efforts but also helps meet food security objectives.

The main work of the GRA occurs in its five research groups. These are focused on key agricultural sub-sectors (Paddy Rice, Croplands, Livestock) and issues common to those sub-sectors (Soil Carbon & Nitrogen Cycling, and Inventory & Monitoring).

### What is the Livestock Research Group?

The GRA's Livestock Research Group (LRG) is focused on reducing the emissions intensity of livestock production systems and increasing the quantity of carbon stored in soils supporting those systems. The LRG works with scientists, farmers and farm advisors, industry and policy makers to research mitigation options, share knowledge and experiences and help strengthen the resilience of livestock farming.

Members collaborate to advance global research on livestock emissions intensity at the same time as supporting countries to achieve their own agriculture and climate change priorities. In this way, the GRA enables progress to be achieved on challenges that any country would struggle to approach on their own.

The LRG is composed of official representatives from GRA member countries, mostly from scientific and government organisations. The LRG also partners with relevant international organisations. New member countries and organisations are always welcome.

The LRG's work plan spans six areas of activity as shown in the diagram. This brochure provides details on each of these work areas.



**2015: Promotional brochure, 8x country case studies, revisions underway to LRG web pages**



## 2015: Flagship activities with FAO, CCAFS, Climate & Clean Air Coalition, SAI Platform



### Global Assessment of Manure Management Policies and Practices

E. Teenstra, T. Vellinga, N. Aektaeng, W. Amatayakul, A. Ndambi, D. Pelster, L. Germier, A. Jenet, C. Opio, K. Andeweg



### Reducing greenhouse gas emissions from livestock: *Best practice and emerging options*



Food and Agriculture  
Organization of the  
United Nations

## REDUCING ENTERIC METHANE

*for*  
improving food security  
and livelihoods





## Workshop summary: Improving GHG inventories from livestock in south & south-east Asia

### Overview

The workshop sought to demonstrate the benefits of higher Tier greenhouse gas (GHG) inventories for livestock systems, and to identify the steps needed for participating countries to improve their inventories consistent with their national circumstances, priorities and capacities.

**2015: Capability building: technical training, inventory workshops, regional and bilateral collaborations**





# Regional engagement in 2015

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- Engagement workshops in Tunis (Tunisia) and Izmir (Turkey)
- Establishment of a regional GRA community for the Mediterranean

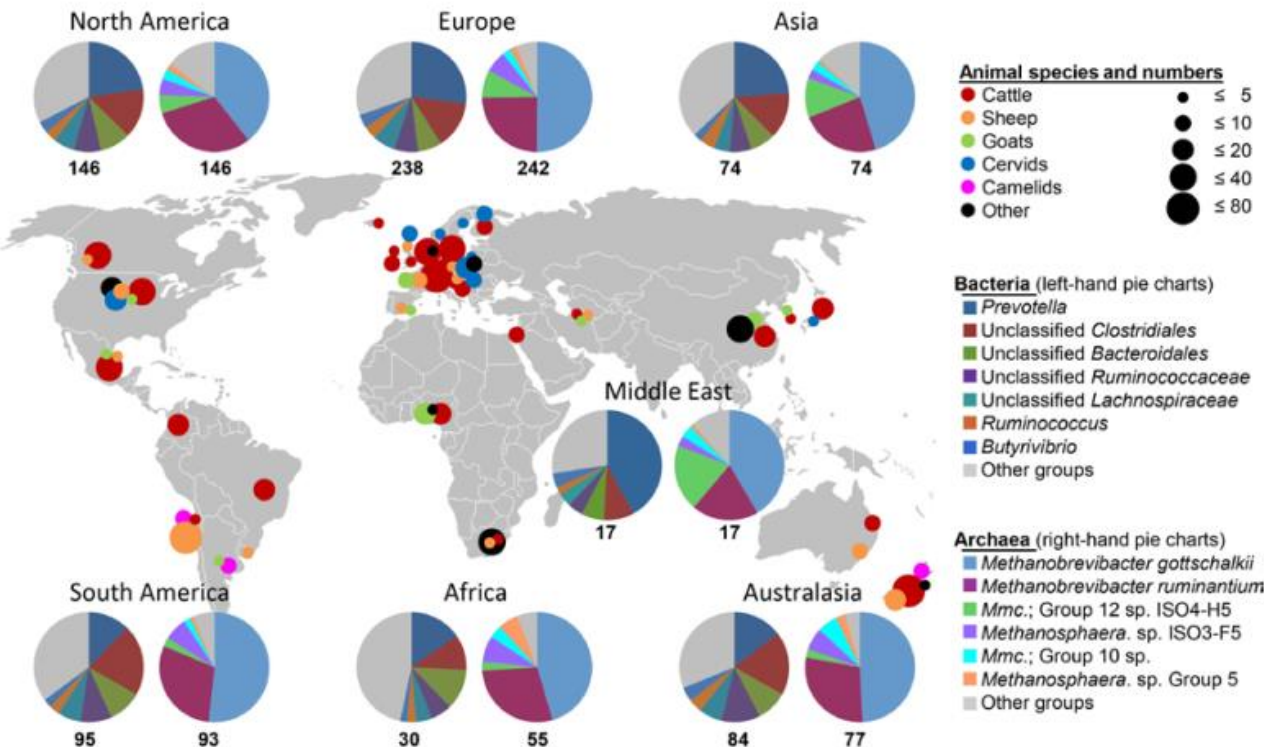
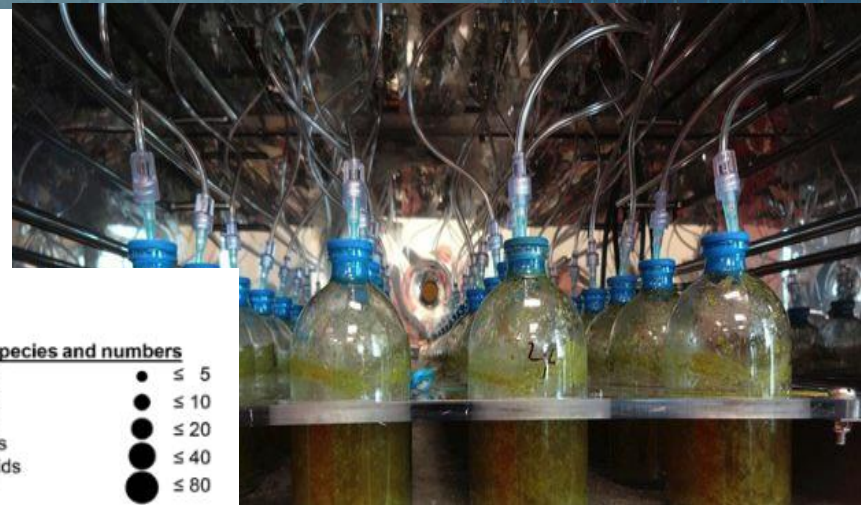


# Collaborative research bearing fruit

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e.g. Global Rumen Census,  
Methane inhibitors



Active research  
networks leading  
major projects incl.  
methodological  
standardisation and  
data collections

Origins of samples and their bacterial and archaeal community compositions in different regions.

Numbers below pie charts represent the number of samples for which data were obtained. The most abundant bacteria and archaea are named in clockwise order starting at the top of the pie chart.

# GRA Council meeting, Sept 2015

- Succession of GRA Presidency from Netherlands to USA and this year to Mexico
- Formation of new 'Integrative Research Group'
  - ✓ First meeting jointly with LRG (this afternoon)
- Agreement to investigate GRA multi-country funding mechanisms, potentially IRC with support from the European Commission
  - ✓ Working Group being established
- Enhanced Secretariat
  - ✓ Position advertised
- Development of a 5-year strategic plan for the GRA
- GRA science conference in 2017 ?
- New GRA partners: Climate & Clean Air Coalition, World Agricultural Forum, CABI
- LRG tasked with exploring the relationship with GACSA and with deepening the relationship with SAI Platform



# Challenges & opportunities in 2016

- Evolving international landscape
  - ✓ GACSA, CCAFS, 4 per mille
  - ✓ Paris agreement: int'l momentum, climate finance, capability building
- Regional pressures and priorities
- Joint LRG/SAI Platform seminars

## **Two joint network meetings, in Lodi (June) and Melbourne**

Recommended actions for 2016:

- Adopt an integrated, holistic approach to mitigation management in livestock farming in order to achieve a more than 40% reduction in the emissions intensity of animal production
- Develop a white paper identifying knowledge gaps for this integrated approach
- Anticipate call for collaborative research from the white paper
- Increase visibility of networks as the engine of the GRA
- Increase engagement in the networks via smart communication

→ Some networks will also see a change in leadership during 2016



# Challenges & opportunities in 2016

- Initial ideas and suggestions for:
  - ✓ Communications / profile / outreach
  - ✓ Methodological guidance
  - ✓ Regional activities
- Research priorities/resourcing: this morning
- Cr

**Achieving outcomes that  
would not have been possible  
without the GRA, and that  
benefit many countries**