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# Climate-smart dairy systems in East Africa

R4D in support of IFAD loan programs

**Birthe Paul (CIAT)**  
**An Notenbaert (CIAT)**  
**Mupenzi Mutimura (RAB)**



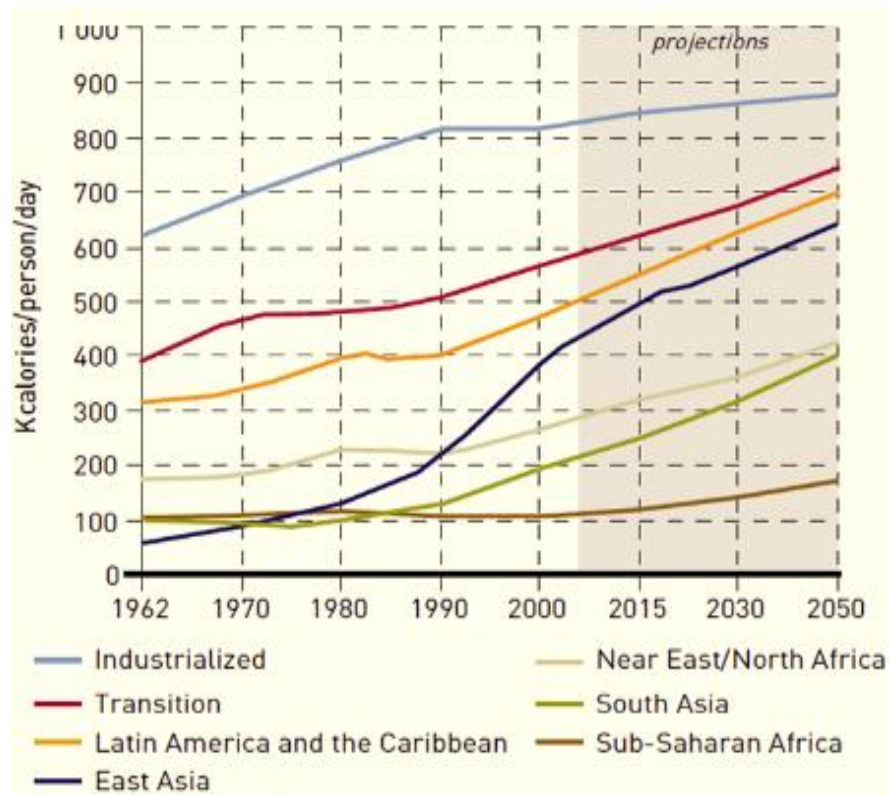
Technical launch of the Rwanda Dairy Development Project (RDDP)

27th of March 2017, Kigali, Rwanda

# Presentation outline

1. Background & justification
2. IFAD R4D grant overview
3. A glimpse of the science behind

# Africa's livestock revolution, and environmental trade-offs

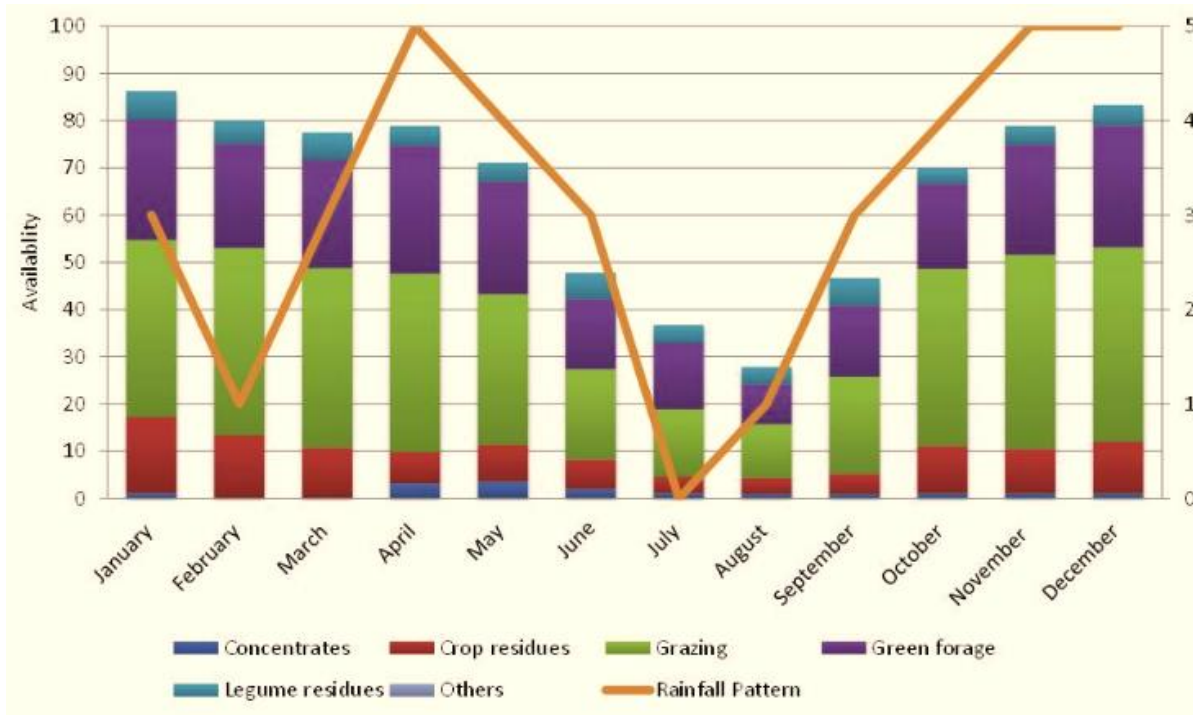


Until 2050, the demand for meat, milk, eggs is likely to double in SSA (FAO 2009) – dairy development could benefit 24 million people in East Africa

The opportunities	The trade-offs
1.3 billion people employed, 600 million of them poor	Produce 14 to 18% of global GHG
Value > 1.4 trillion USD, 40% of global agricultural GDP	Feed production uses 33% of global crop land
Food for at least 830 million food insecure people, 33% of protein consumption	Takes 32% of global water consumption
60% of global cropping area receives manure application	

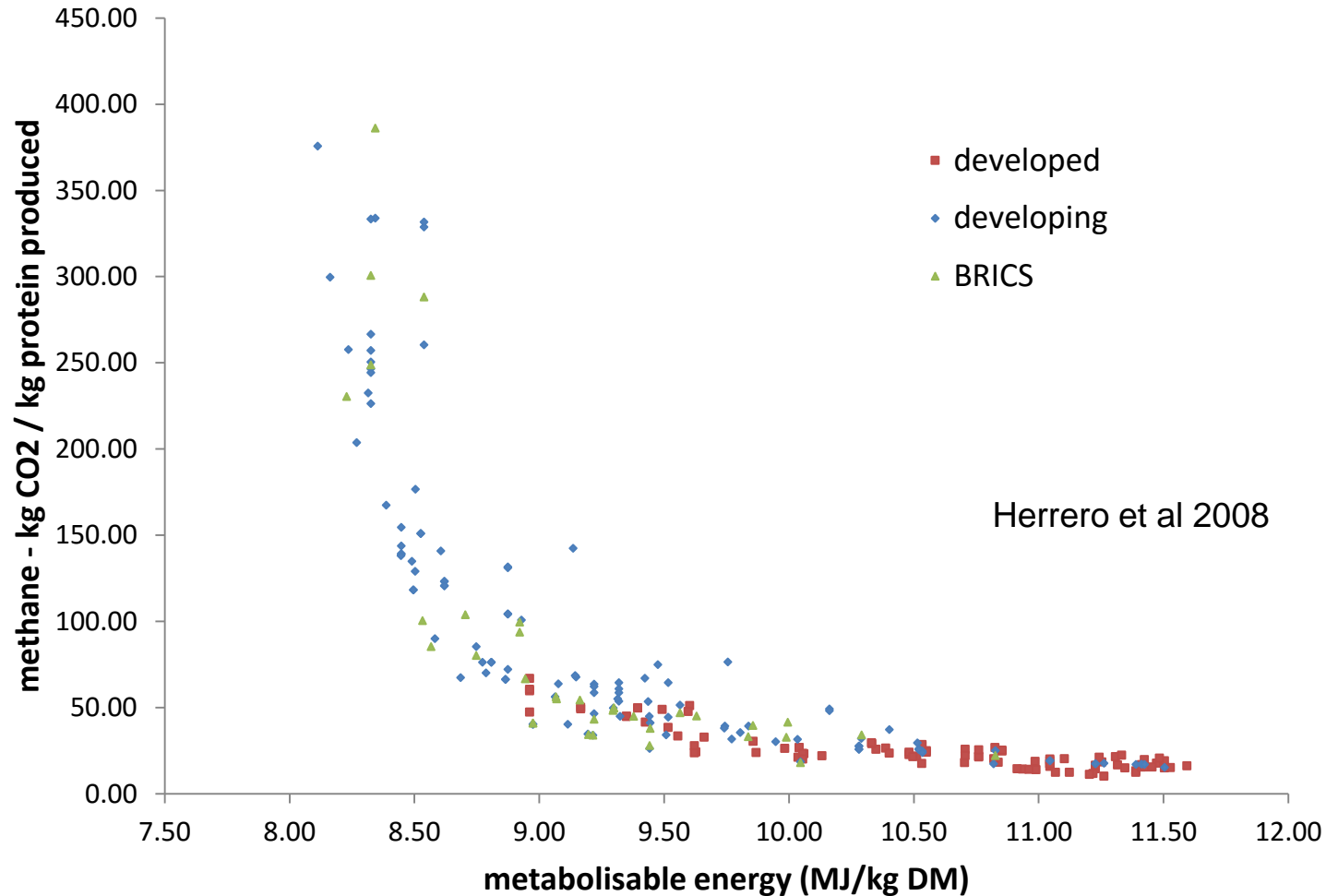
Environmental trade-offs call for **climate-smart** and **resource-efficient** livestock production

# Feed as a main constraint to dairy production



Main production constraint is sufficient quantity and quality of feeds on a consistent basis – and it is the major production cost

# Improved feeding as entry-point for climate-smart dairy



The better we feed cows, the less methane from enteric fermentation -> lower emissions per kg of milk they produce



# Climate-smart dairy systems in East Africa through improved forages and feeding strategies: enhancing productivity and adaptive capacity while mitigating GHG emissions



2 million USD/4 years (+ 1 million co-financing)

Rwanda and Tanzania

CIAT, ILRI, RAB, TALIRI, CSIRO



## Outputs

1. Assess opportunities to increase productivity and NR efficiency of crop-livestock systems at multiple scales
2. Design context-specific forage options for productivity, environmental and adoptability considerations
3. Assess multi-dimensional trade-offs of forage-based crop-livestock interventions
  - a) Ex-situ (ILRI)
  - b) In-situ (CIAT, RAB)
4. Support scaling by IFAD investment projects and other development partners

# Niches for additional forage growing in Rwanda

Marshy areas

Woodlots/plantations

Banana inter-cropping

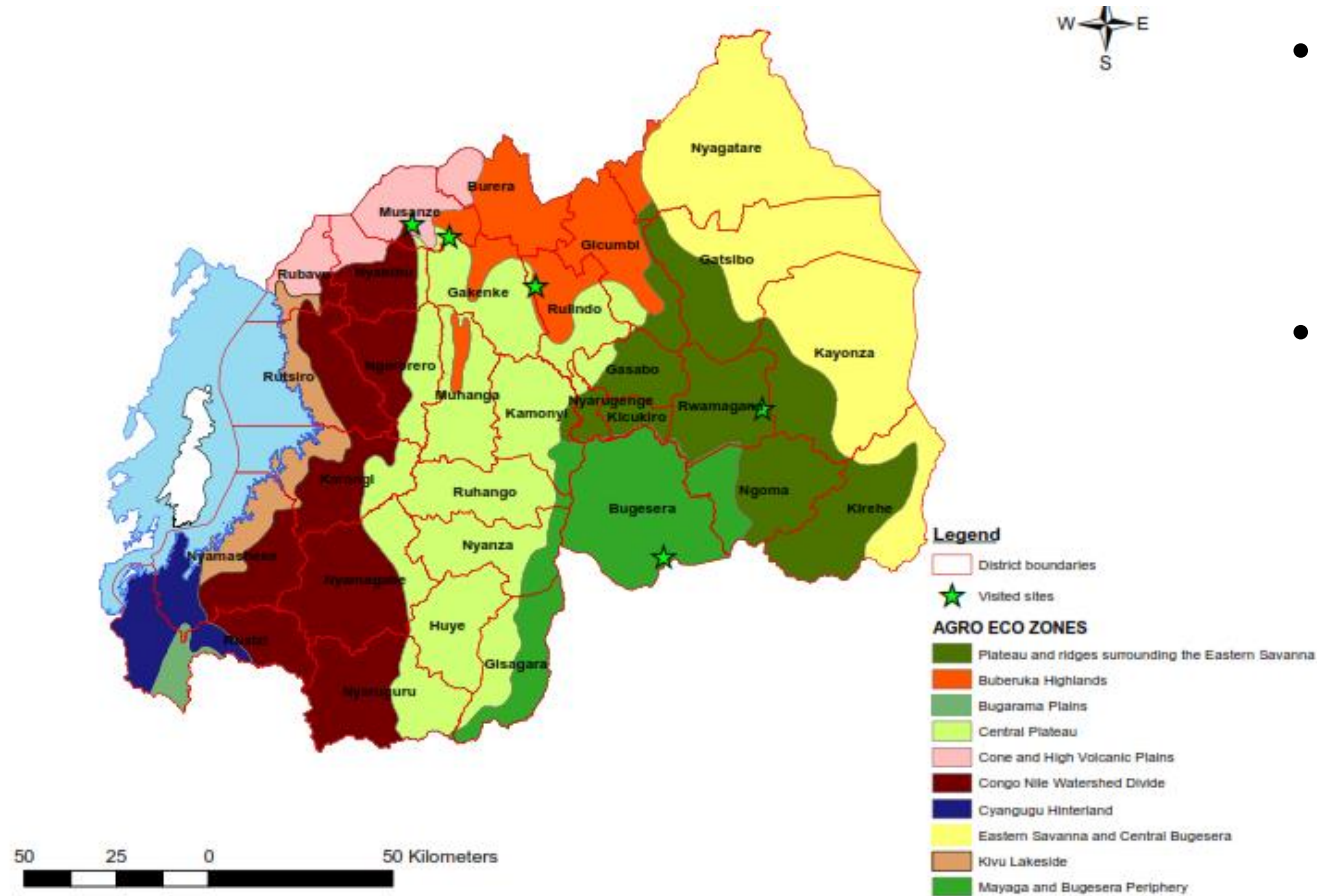
Farm boundaries

Soil erosion structures

Road sides

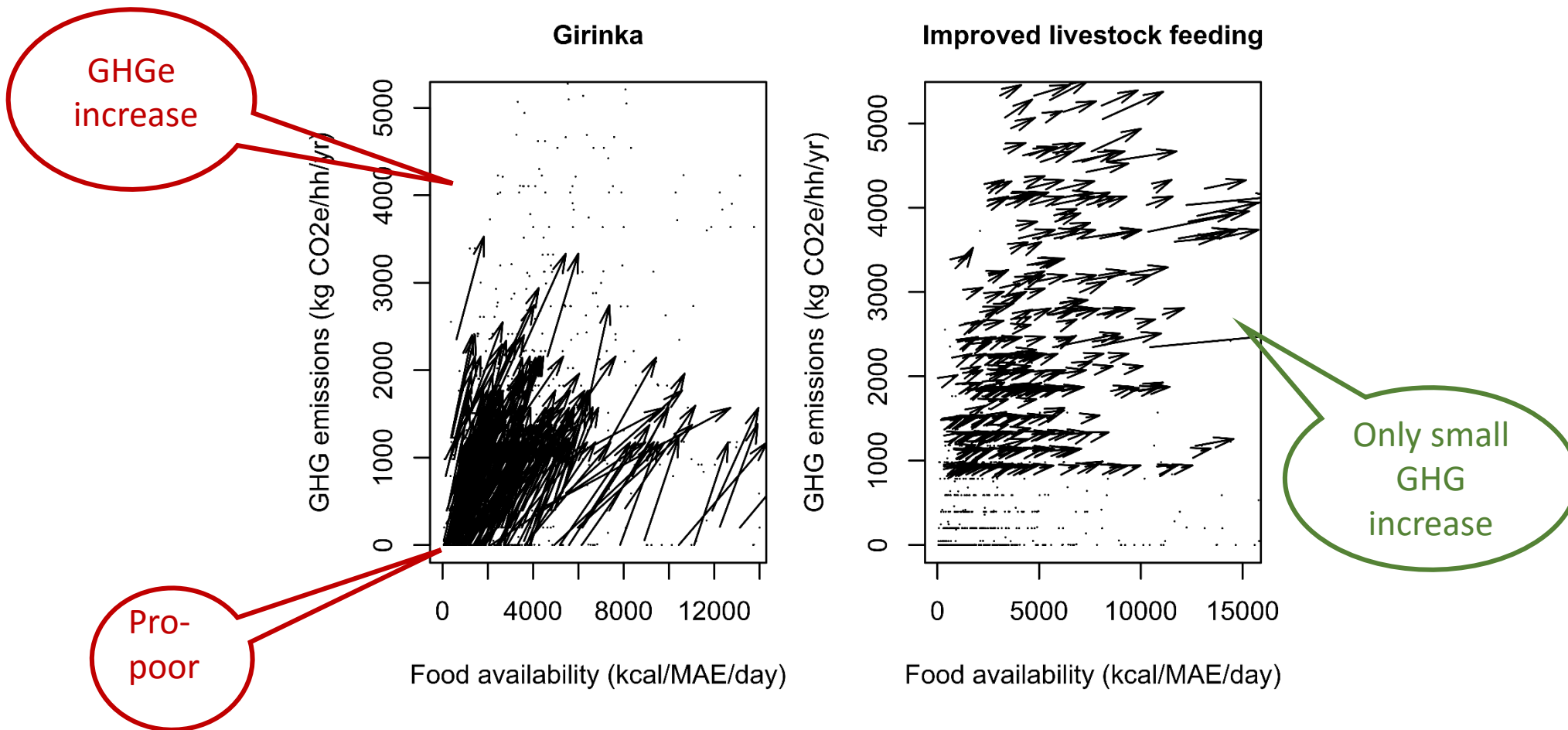
Fodder plots

Drier areas



- RAB grows 88 forage legume and 31 grass varieties/accessions at Karama research station
- Gap between available and required area for growing feed -> niches for improved forages needed

# Potential impacts and trade-offs of policies in Rwanda







In-situ greenhouse gas measurements with closed chamber method

Improving emission factors and model parameterization – eg IPCC, GLEAM, EXACT, Ruminant

# GHG monitoring for program and policy support

- Rwanda's national strategy on Green Growth and Climate Resilience
- Rwanda's National Strategy for Climate Change and Low Carbon Development Strategy
- NDC for Rwanda -> improved quantitative reporting to IPCC
- Many organizations/investors interested in climate impact of their programs – including IFAD, Send a Cow
- Assist in arguing for increased investment from Green Climate Fund
- Carbon trading?



<http://news.trust.org/item/20160621101854-b7xkz/>



## Food security and carbon hoofprints

by [Georgina Smith](#) | [@georginaismith](#) | CIAT (International Center for Tropical Agriculture)  
Tuesday, 21 June 2016 10:18 GMT



**Thank you**  
[B.Paul@cgiar.org](mailto:B.Paul@cgiar.org)  
[A.Notenbaert@cgiar.org](mailto:A.Notenbaert@cgiar.org)  
All pictures taken by An Notenbaert, Georgina Smith, Stephanie Malyon (CIAT)

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**\* Any views expressed in this article are those of the author and not of Thomson Reuters Foundation.**

At night, Rwanda's capital Kigali is a sparkling carpet of lights. Yet the tightly packed white beams throw light on a more serious circumstance facing the Rwandan government across the country. Population pressure.

How to feed more people with fewer resources was a topic much deliberated at the **Africa Agriculture Science Week last week** in Kigali. Rwanda is among the most densely populated countries in the world; its population is expected to double to 26 million by 2050.

Farm plots are already among the smallest in sub-Saharan Africa. Yet with declining plot sizes, it's not only food security which is at stake; but nutrition security too, say experts.

In Rwanda, reducing carbon emissions from livestock production can't come at the cost of lowering production – millions of farmers depend on it for their livelihoods.

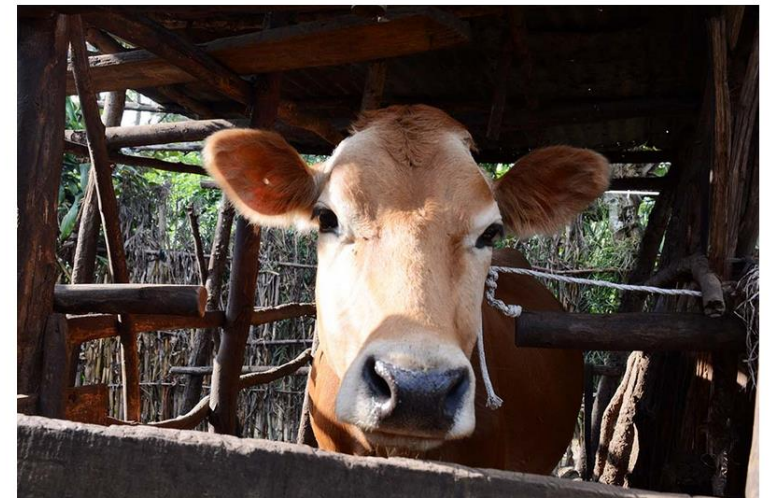
But farmers need advice so they can make environmental choices that won't hurt their income or livelihoods. **This working paper just released outlines options** for integrating forages in Rwandan cropping systems to increase forage production.

In the meantime, research teams are weighing up trade-offs so that Rwanda's farmers can lower their carbon footprint without lowering their production. One way to do that is to improve feed quality for livestock.

<http://blog.ciat.cgiar.org/one-cow-program-can-cut-poverty-and-pave-the-way-for-lower-hoofprints-too>

## "One cow" program can cut poverty and pave the way for lower 'hoofprints' too

by Georgina Smith | Mar 24, 2017



A new study shows that Rwanda's One Cow per Poor Family program can significantly cut food insecurity – and with improved cattle feeding, it can help reduce greenhouse gas emissions intensity too.

The study, conducted by CIAT with partners including the Rwanda Agriculture Board (RAB), used survey data from almost 900 farmers across Rwanda's complex landscape, to compare potential impacts of different policies and programs designed to boost agricultural production and reduce poverty while assessing their environmental impact.

As one of the most densely populated countries in the world, Rwanda struggles with severe erosion and declining soil fertility. Agriculture supports 80 percent of the population, and the Rwandan government is committed to finding low-carbon development options.

The One Cow per Poor Family initiative, known locally as Girinka, was one of the policy programs studied. It found that, while the Girinka program could increase food sufficient households by 11%, it as much as doubled – and in some cases tripled – greenhouse gas emissions from farming households.

"The question we set out to tackle was: what options can we put forward that not only help farmers