Feasibility of Low Emissions Development Interventions in the Kenyan Livestock Sector

Polly Ericksen (SLS program leader) and Todd Crane

ILRI

SAIRLA Second National Learning Alliance Workshop

ILRI, Addis Ababa, 23 November 2017

CGIAR RESEARCH PROGRAM ON Climate Change, Agriculture and Food Security CCAFS

ILRI INTERNATIONAL LIVESTOCK RESEARCH INSTITUTE

CGIAR

USAID FROM THE AMERICAN PEOPLE

Why LED and SI?

Livestock production is significant source of emissions from agriculture

- High intensity of emissions per unit of product
- Countries have now committed to reductions in NDCs

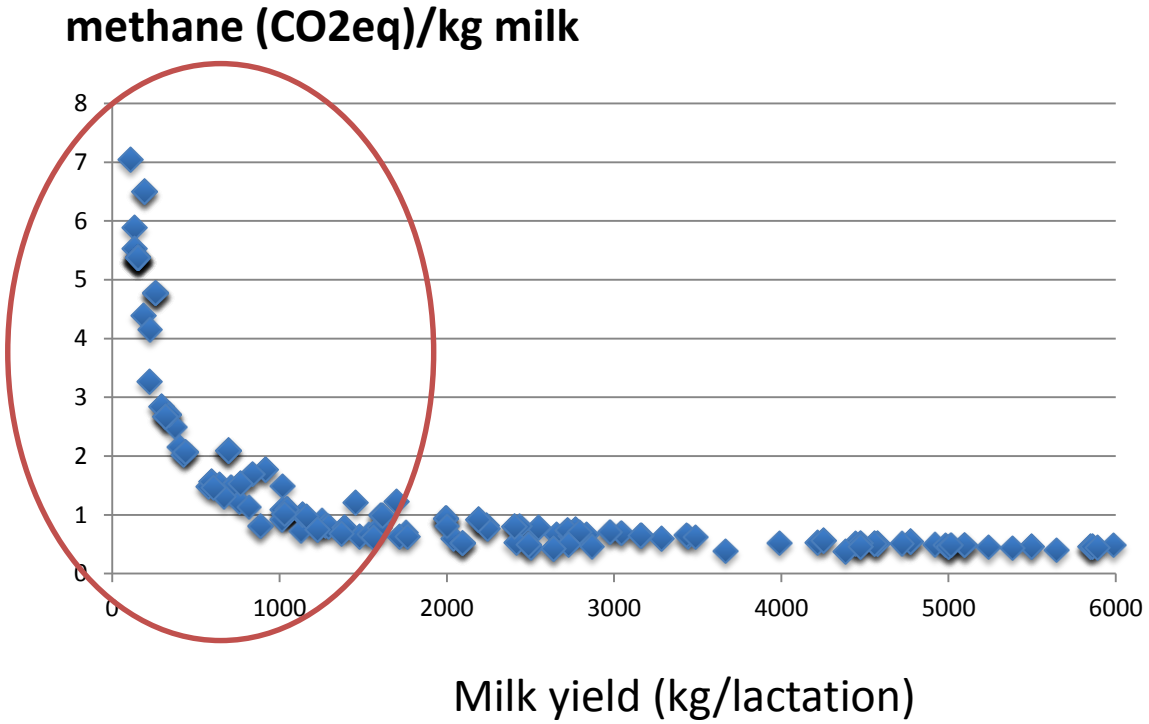
Low productivity of livestock in much of Africa both an opportunity and a concern

- Improving productivity will reduce emissions intensities

ILRI CGIAR

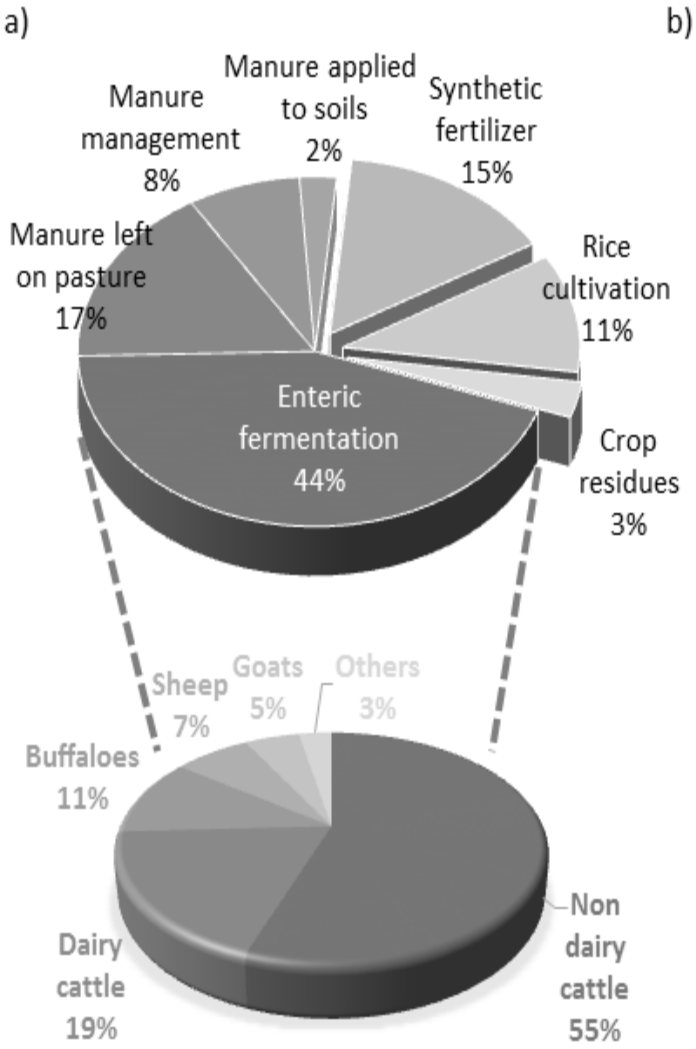
Exploiting yield gaps is key to achieve environmental benefits in ruminant systems

Gerber et al, FAO 2013



Largest improvements in low producing animals

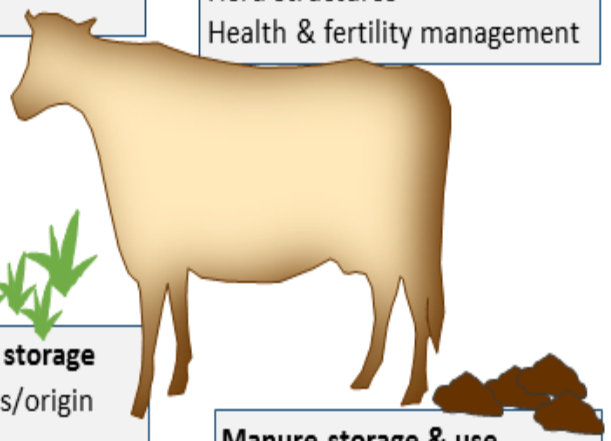
Sources of GHG emissions during livestock production (Dickhoefer et al., 2014)



b)

Enteric fermentation
Choice of diet ingredients
Improved diet digestibility
Enhanced feed intake capacity
Feeding management
Rumen modifiers

Herd management & performance level
Choice of animal species/breed
Genetic selection
Herd structures
Health & fertility management



Feed production & storage
Choice of feed types/origin
Plant breeding
Improved harvest methods
Optimized fertilizer use
Feed conservation/processing technologies
Feed waste management

Manure storage & use
Adapted protein intake
Reduced protein degradability
Improved diet digestibility
Use of fibrous feeds
Optimized excreta management
Excreta recycling

ILRI CGIAR

Interventions to reduce emissions intensities

- Improvements in Feed Quality to increase productivity
  - Supplemental fodder from improved forage species – Mixed crop-livestock
  - Supplemental feeding with concentrates –dairy
  - Managed grazing – extensive pastoral

Interventions to reduce emissions intensities

- Manure management
  - Biodigesters for methane capture – (zero grazing) dairy
  - Manure storage in covered heaps – mixed crop-livestock

Interventions to reduce emissions intensities

- Improved animal husbandry
  - Reduce chronic disease burden of intestinal parasites – all systems
  - Reduce age at slaughter – pastoral systems

Technical Mitigation Potential

- Improved feed quality: Opio et al (2016) suggest 26-28% reductions in intensities for lactating cattle;
- Concentrates 20-27% reductions in dairy (Opio)
- Managed grazing: similar to improved feed quality (?)

Technical Mitigation Potential

- Biodigesters – can avoid 60 to 80% of methane emissions
- Manure storage – highly dependent on management but can reduce N_2O and methane emissions significantly
- Reduce parasite burden – 10% (Kenyon et al Scotland)
- AI – one estimate of 24%

Cross Cutting Themes

- Degree of market orientation is major precondition for upgrading
- Even with market orientation, low milk prices inhibit investment in upgrading
- Small land size as major limitation
- Low trust and accountability of input services

ILRI
INTERNATIONAL LIVESTOCK RESEARCH INSTITUTE

Improved Forages

- Barriers
  - Low availability of land (B) – paddocks?
  - Diversified cropping strategies (M, I?)
  - Low accessibility of improved planting material (M)
- Potential incentives?
  - Field trials to improve farmer awareness
  - Investments to stimulate fodder seed
  - Financial evaluation of specialization vs diversification
- NB: AI and dairy meal become more attractive when basal diet improves

ILRI
INTERNATIONAL LIVESTOCK RESEARCH INSTITUTE

Biodigestors

- Barriers
  - High upfront cost (M)
  - Maintenance requirements (I)
  - Slurry transport (B)
- Incentives
  - Household energy source (direct benefit)
  - Improved household health (direct benefit)
  - Farmer innovation on slurry transport
  - ?

ILRI
INTERNATIONAL LIVESTOCK RESEARCH INSTITUTE

Managed Grazing in Rangelands

- Barriers
  - Require high institutional governance capacity (O)
  - Expansive landscape commitment (O,B)
  - Long time horizon to see substantial carbon sequestration effects (B)
- Incentives
  - Improve market access to drive intensification
  - Couple with improved herd management and health

ILRI
INTERNATIONAL LIVESTOCK RESEARCH INSTITUTE

Donor acknowledgement

- Funded from USAID through CCAFS

better lives through livestock

ilri.org

ILRI thanks all donors and organizations which globally support its work through their contributions to the CGIAR system

Patron: Professor Peter C Doherty AC, FAA, FRS
Animal scientist, Nobel Prize Laureate for Physiology or Medicine–1996

Box 30709, Nairobi 00100 Kenya
Phone +254 20 422 3000
Fax +254 20 422 3001
Email ilri-kenya@cgiar.org

ilri.org
better lives through livestock

ILRI is a CGIAR research centre

Box 5689, Addis Ababa, Ethiopia
Phone +251 11 617 2000
Fax +251 11 667 6923
Email ilri-ethiopia@cgiar.org

ILRI has offices in East Africa • South Asia • Southeast and East Asia • Southern Africa • West Africa