

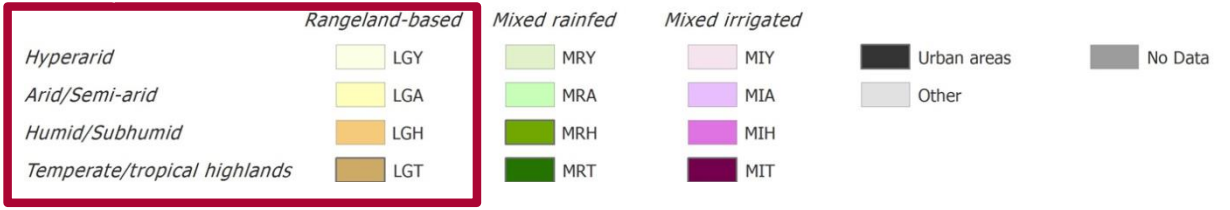
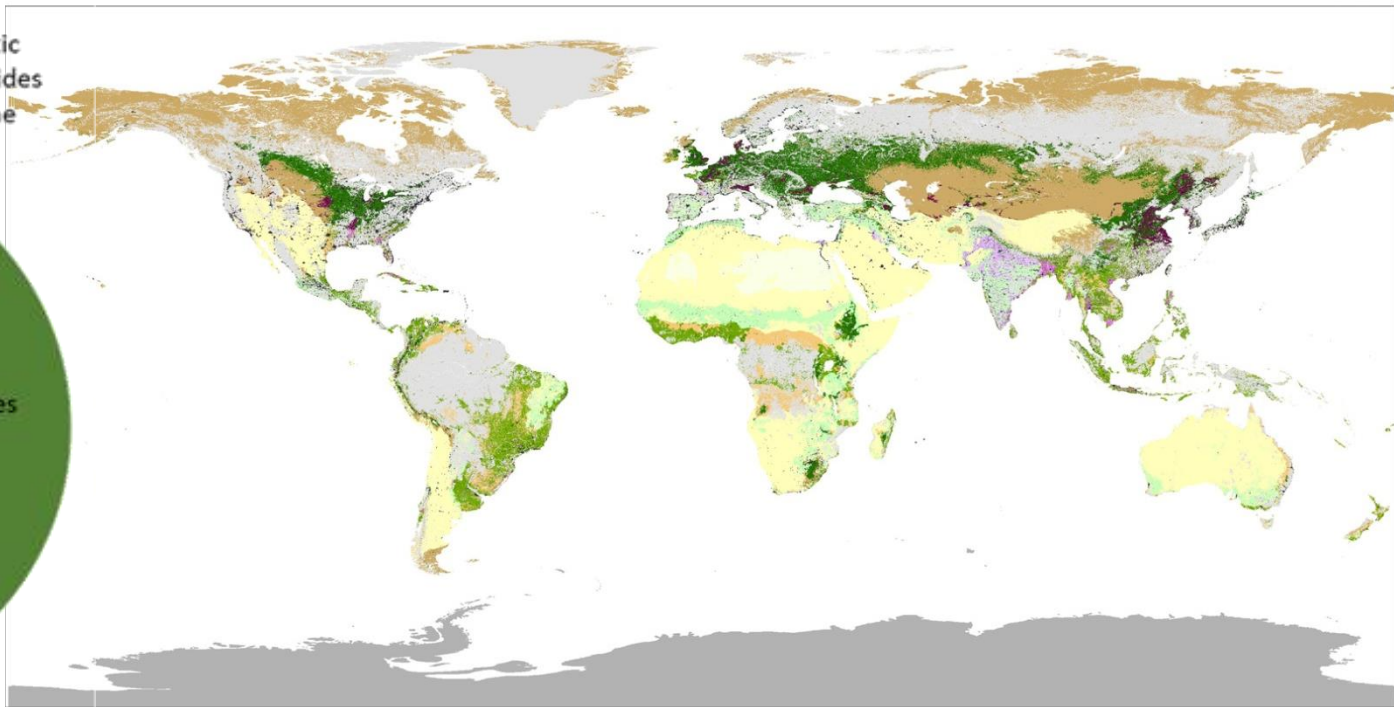
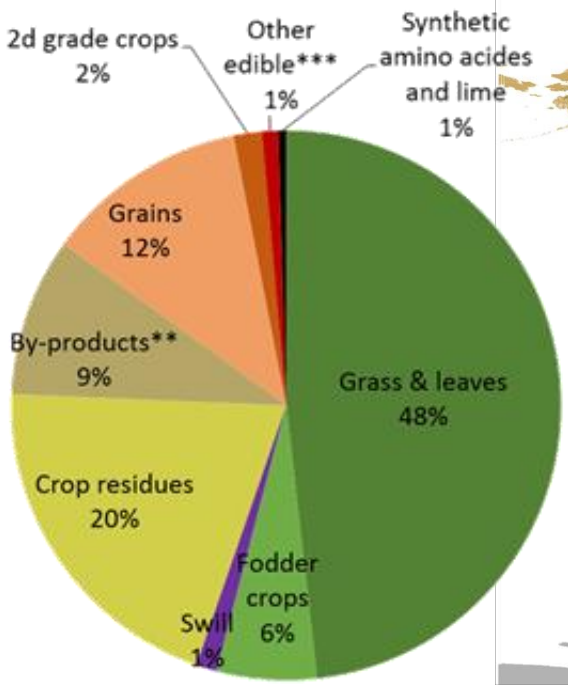


Integrating rangeland and livestock analysis – Example from the development of climate smart livestock solutions in Southern Africa

Teillard F, Mottet A, Falcucci A

Context

Rangeland systems represent a large part of livestock production



September 2011

Sources: GLEAM 2.0, GLW, FAO 2013

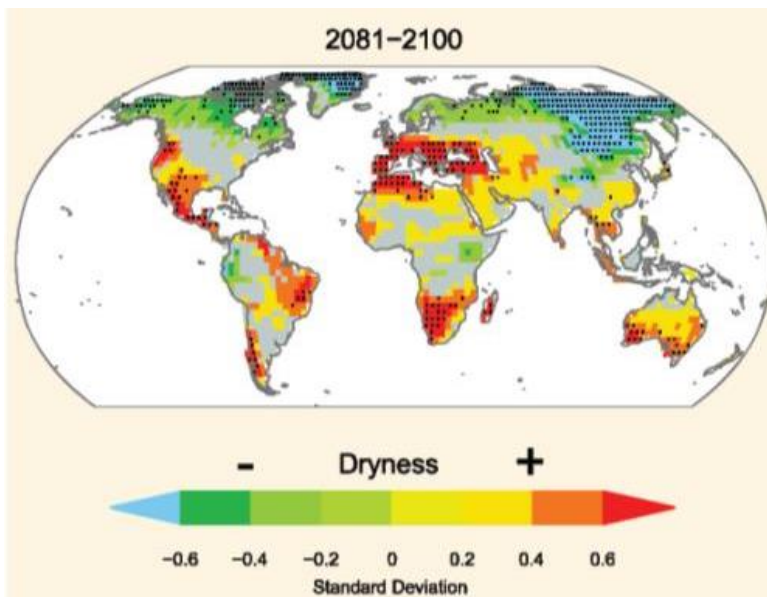
Context

Livestock need to increase production in the context of climate change

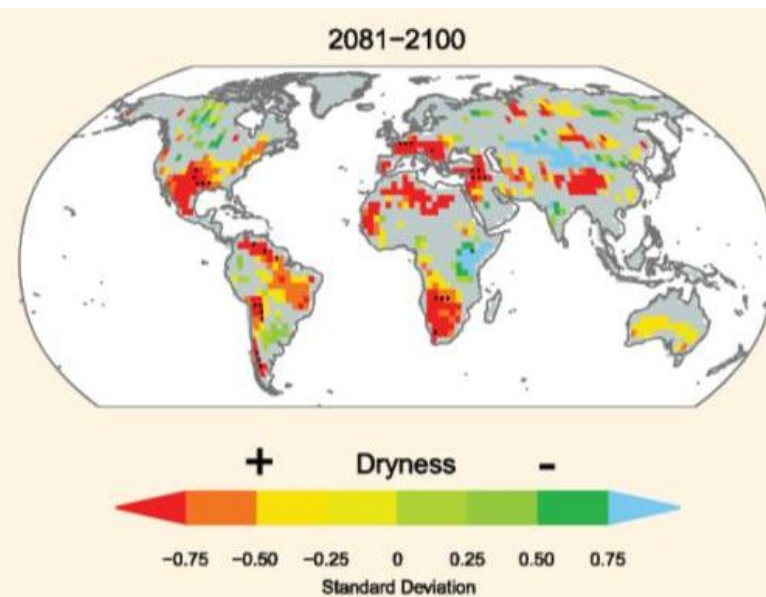
+100%

In Southern Africa, demand for animal products will double between 2006 and 2050

Consecutive dry days



Low soil moisture

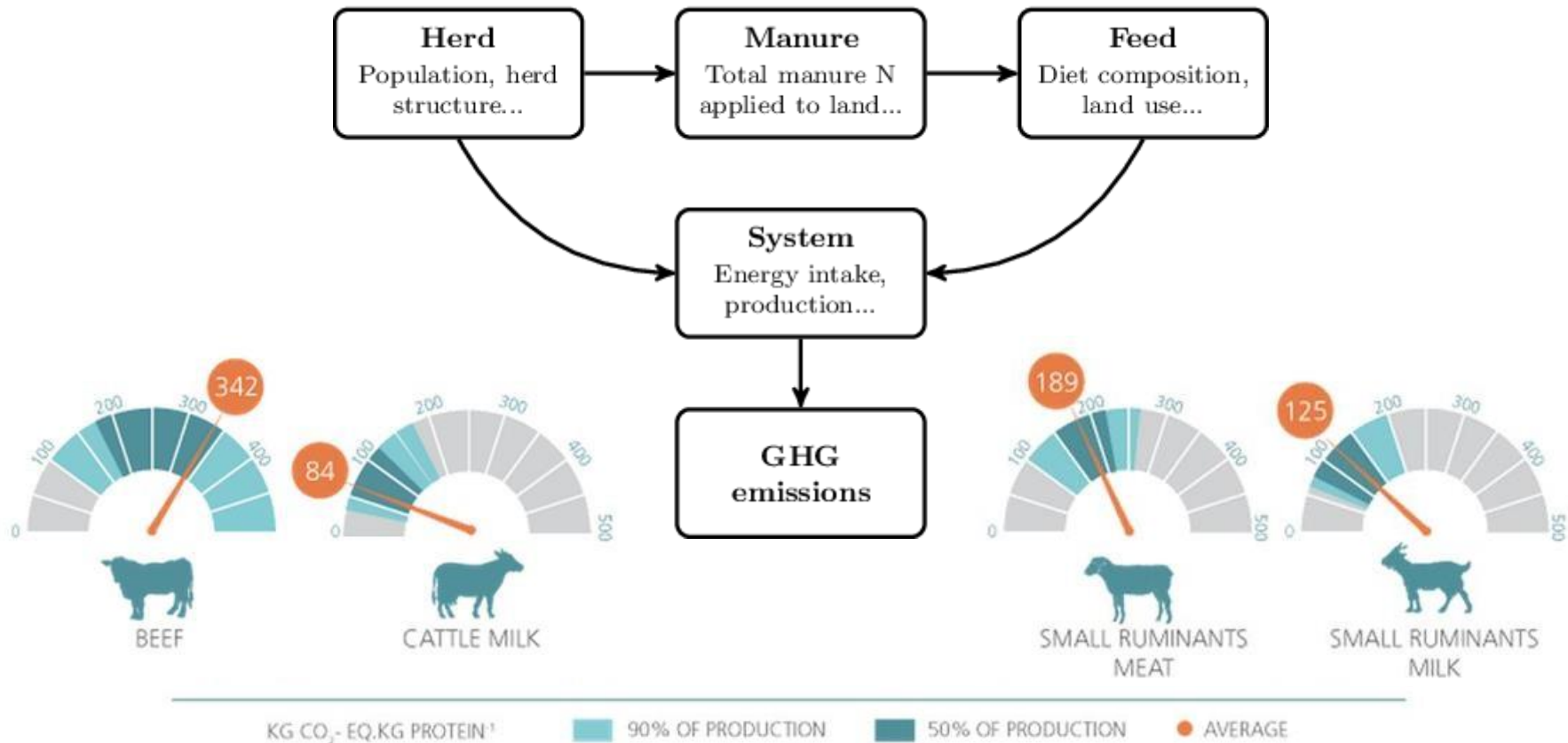




Questions

- How to integrate livestock and rangeland data?
- What is the role of livestock in building resilience? The example of Zambia
- Can interventions aiming to improve production and reduce variability also decrease GHG emissions?

Approach – the GLEAM model (demand)



Global emission intensities by commodity. All commodities are expressed in a per protein basis. Averages are calculated at global scale and represent an aggregated value across different production systems and agro-ecological zones.

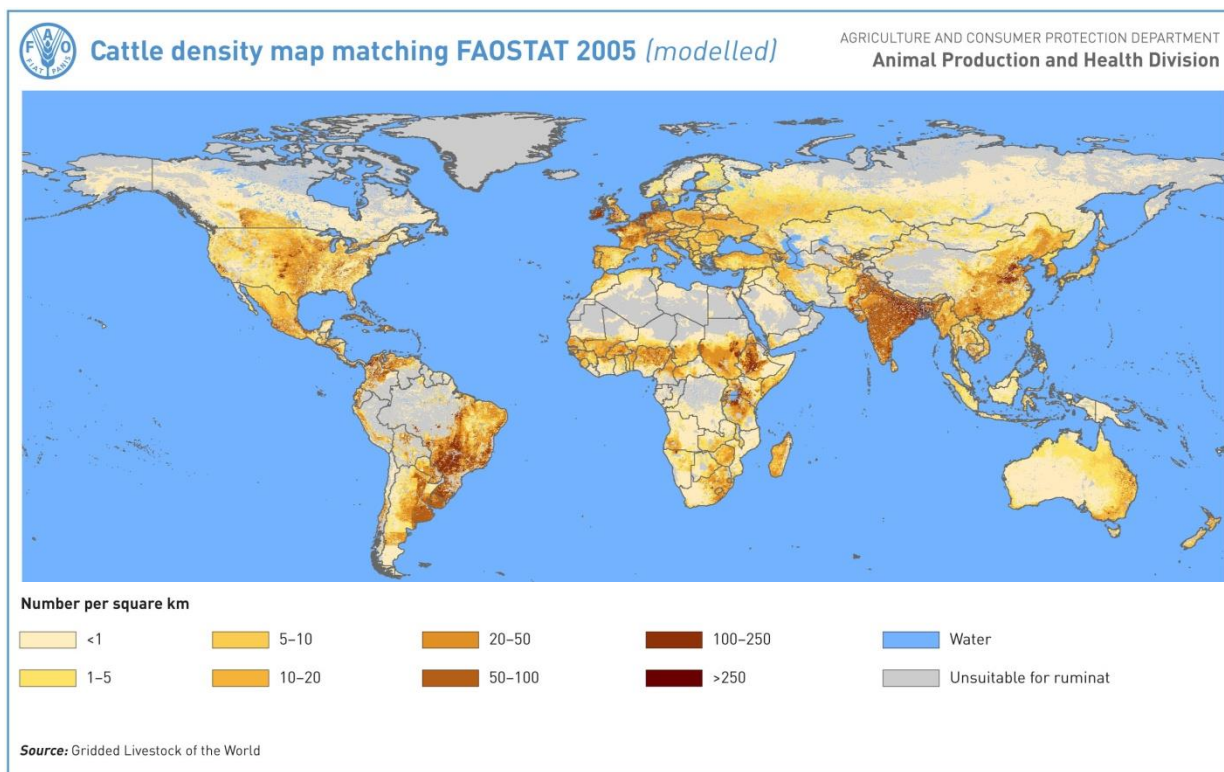
Interactive version: GLEAM-i <http://www.fao.org/gleam/resources>



Approach – the GLEAM model (demand)

- Distribution: **gridded livestock of the world**
- Repartition in cohorts & production systems
- Detailed energy requirements

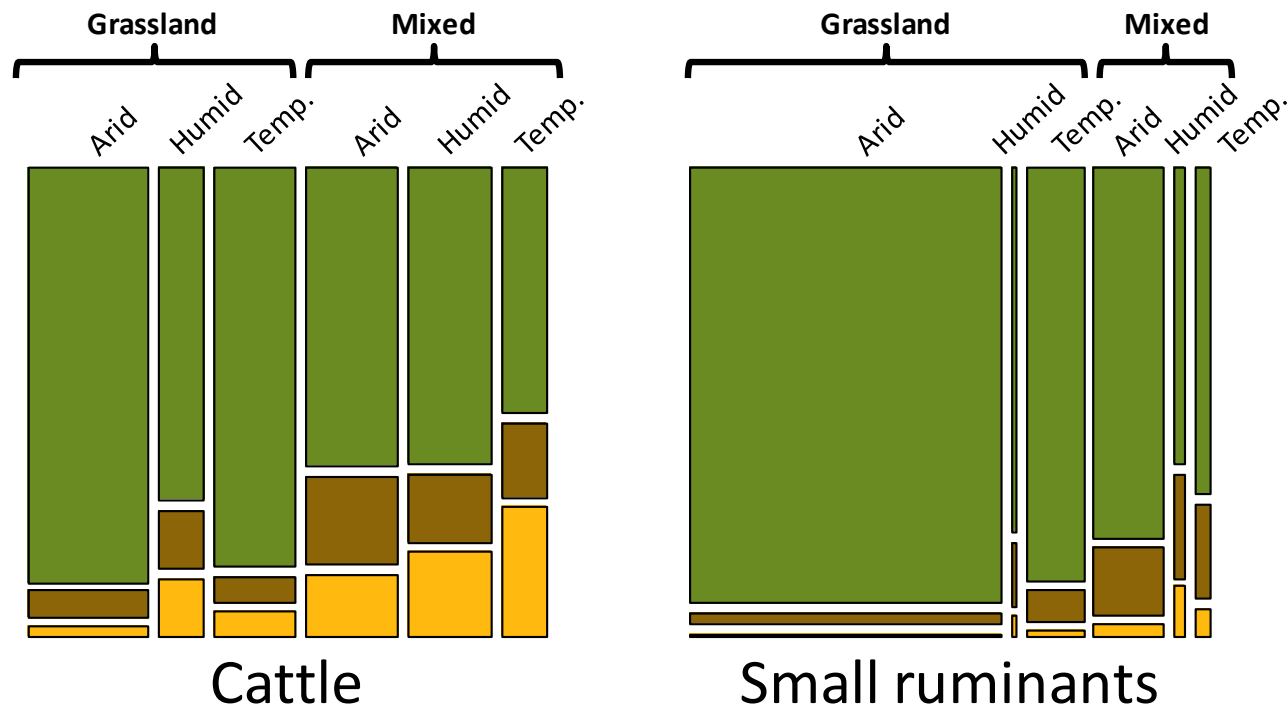
Herd
Population, herd
structure...



Approach – the GLEAM model (demand)

- Feed basket (30 feed components)
- Grouped into 3 main feed categories

Feed
Diet composition,
land use...

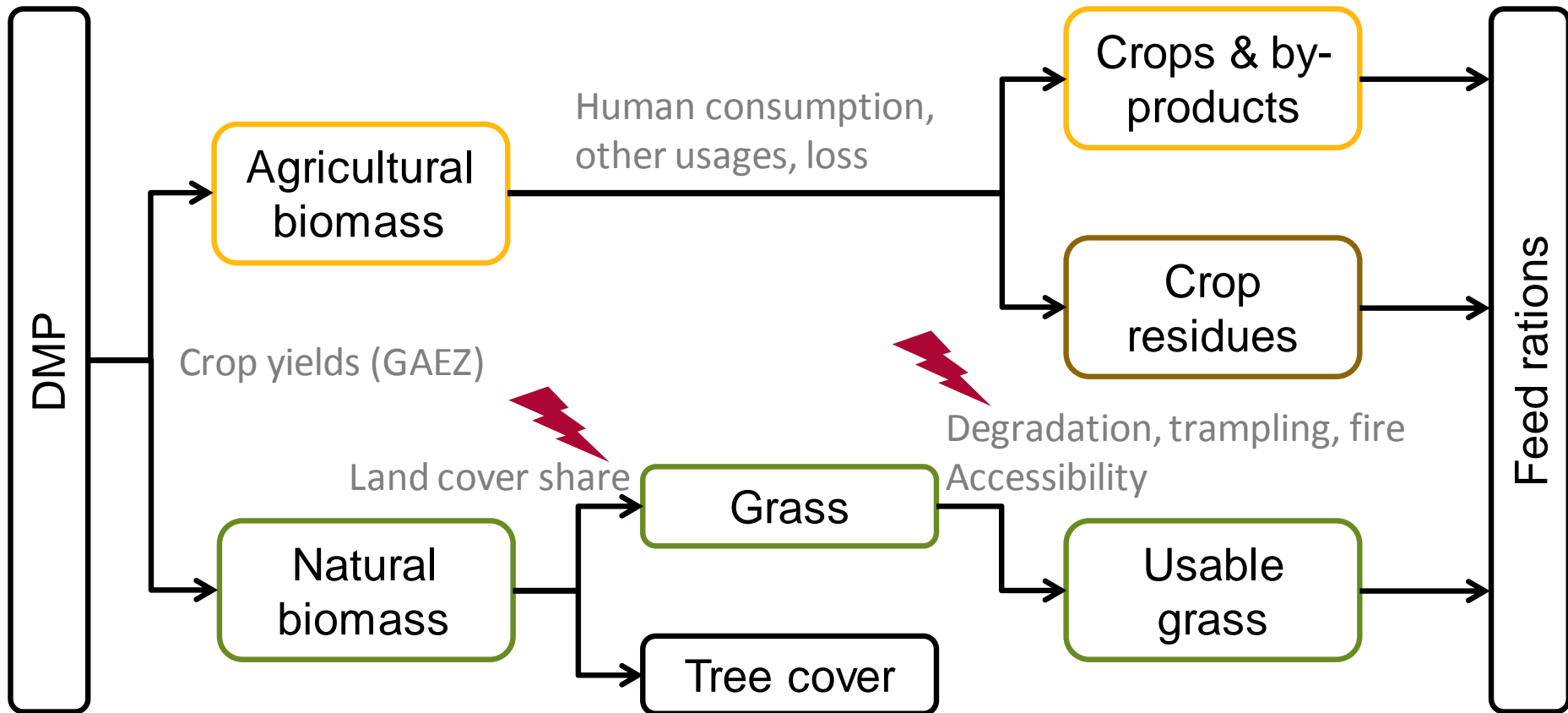


Global feed intake
of ruminants

- Grass
- Crop residues
- By-products

Approach – Dry Matter Productivity (supply)

- SPOT-VGT data available through the DevCoCast project
- Split between the 3 feed categories and wet/dry seasons





Approach – Scenarios and improvement options

Vegetation (supply)

2012-2030 scenarios

- Baseline
- Drought

Livestock (demand)

Improvement options

- Animal husbandry & health
- Feeding practices



Production

Cow milk, beef and goat meat

Adaptation

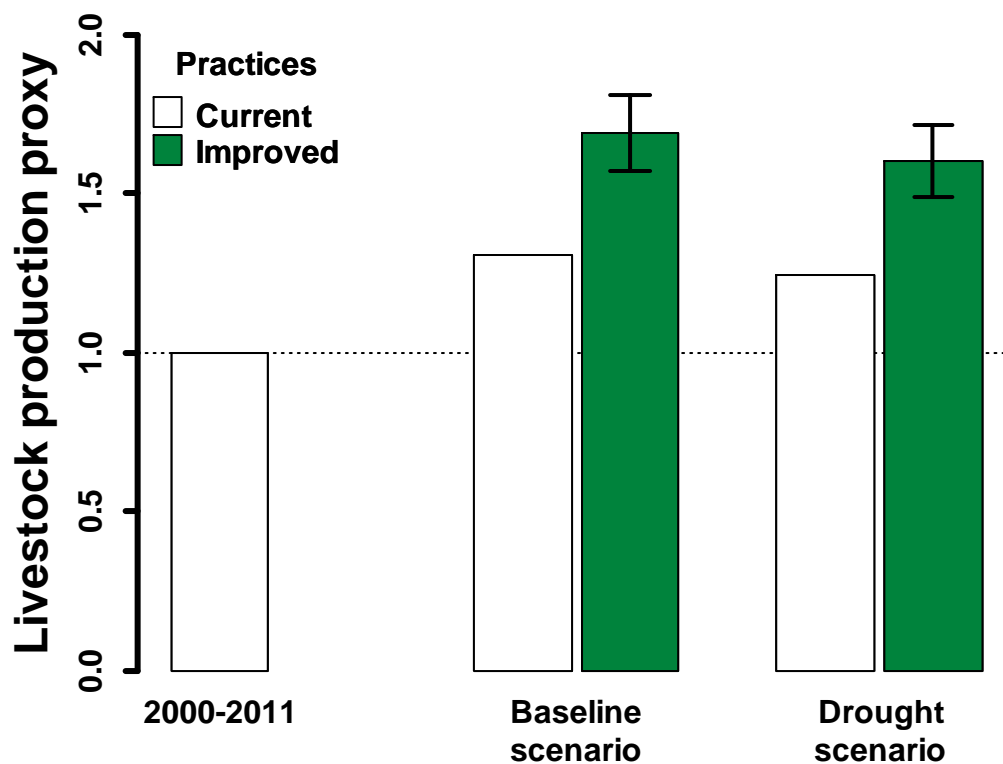
Resilience of production to variability in biomass availability

Mitigation

GHG emissions and emission intensity

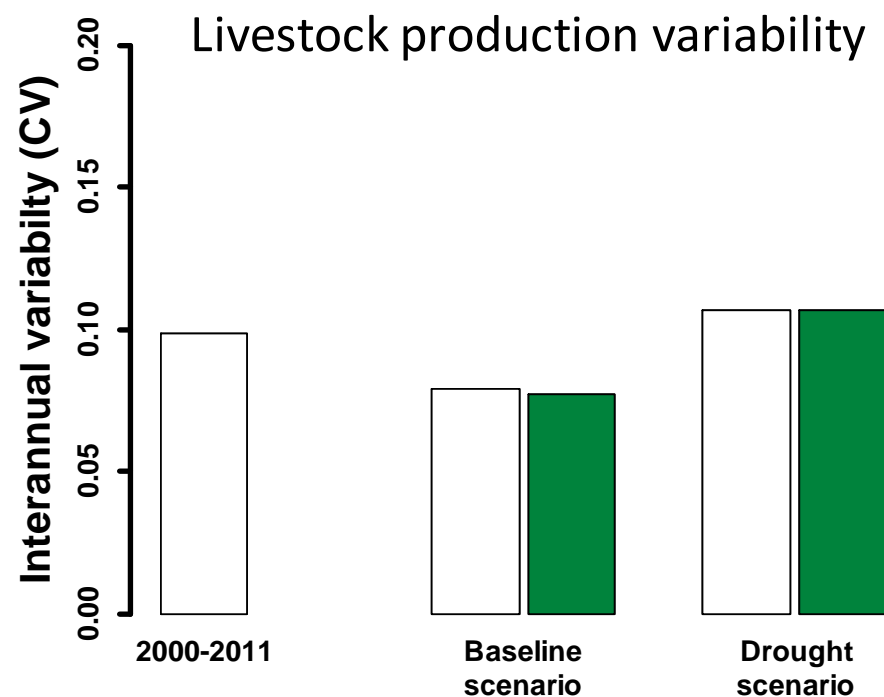
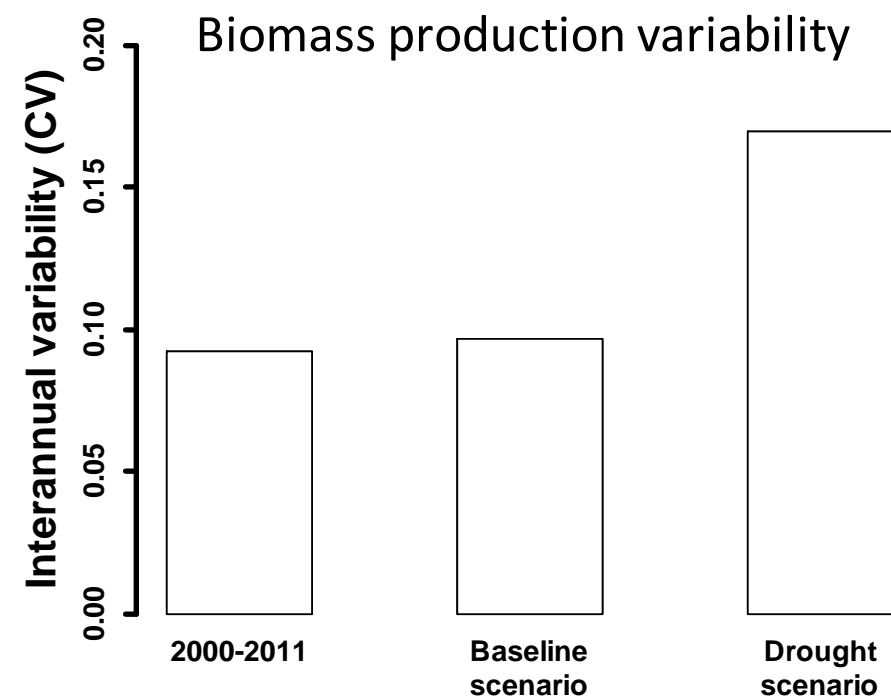
Results – production

- Sector growth: +30% production compared to 2000-2011
- Improved practices: +57-80% in the baseline scenario, +49-71% in the drought scenario



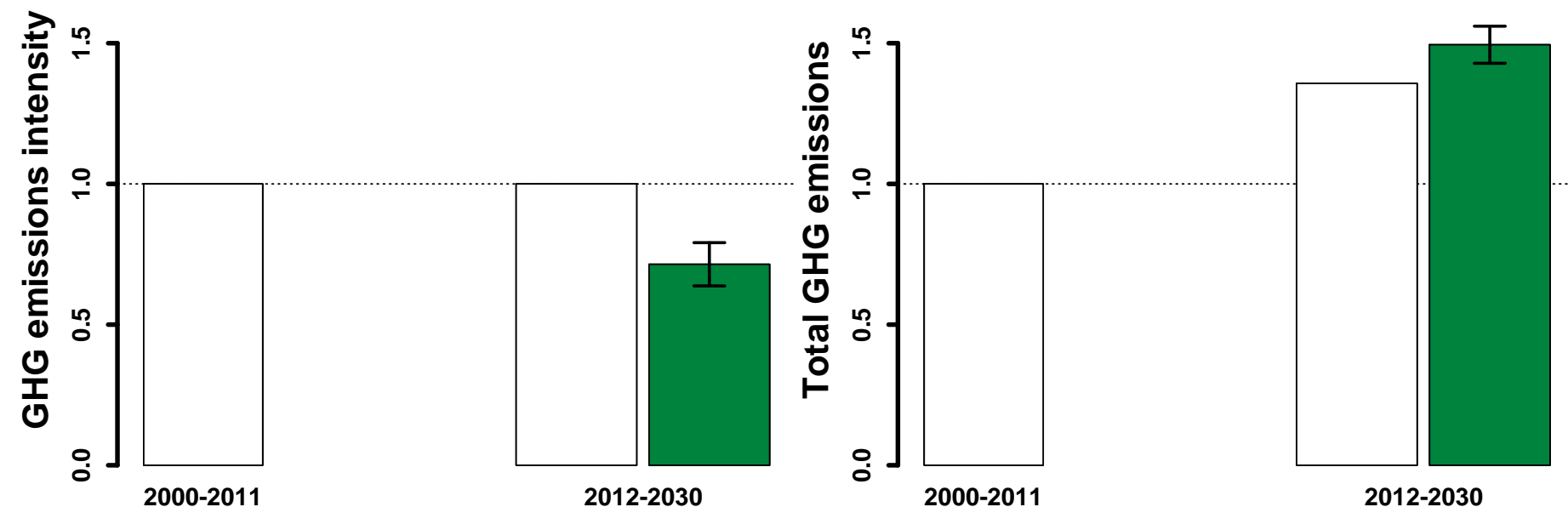
Results – adaptation

- Lower variability of livestock production compared to biomass availability, especially in the drought scenario



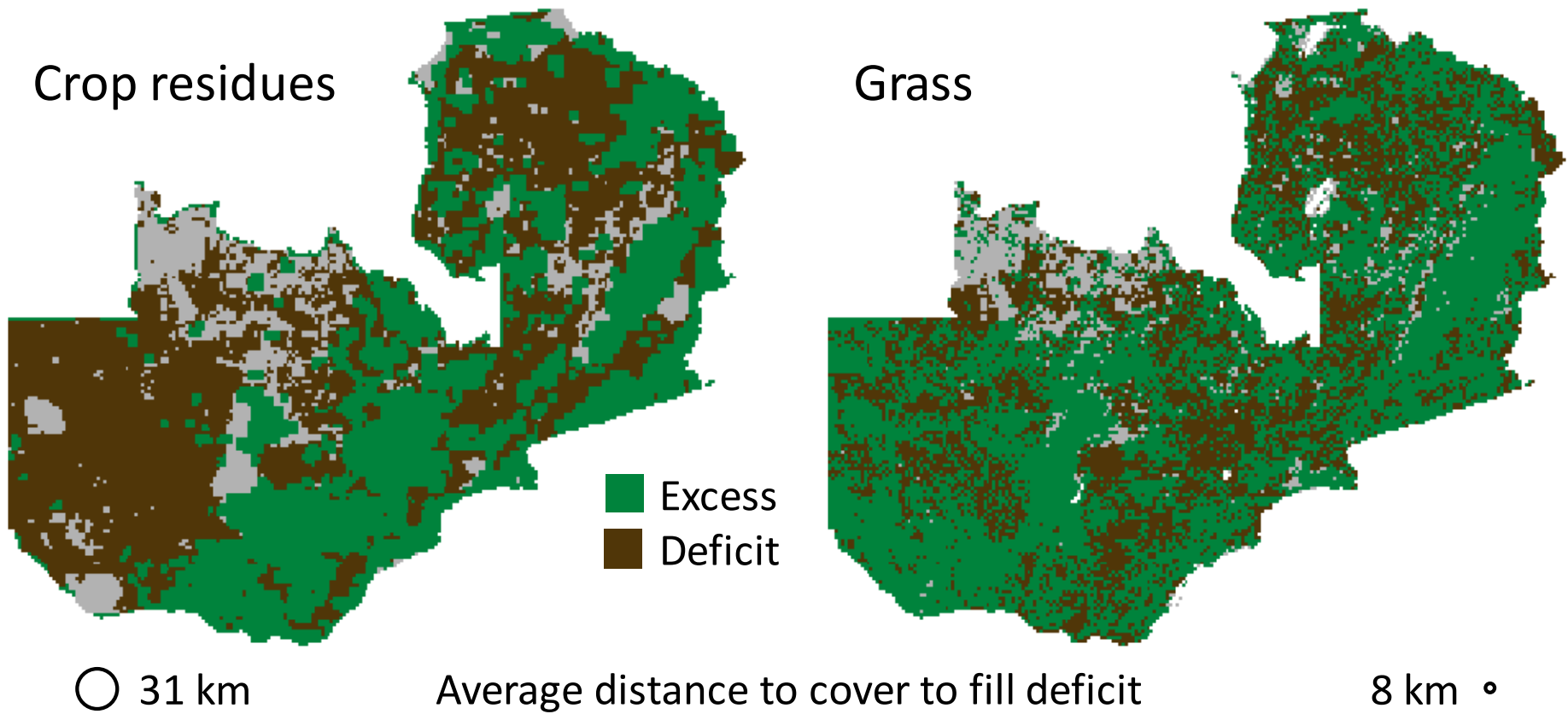
Results – mitigation

- Improvement options: reduction of emission intensities, increase in absolute emissions due to sector's growth and reduced mortality
- Absolute emissions reduced by 25-31% when accounting for C sequestration in pastures (Henderson et al. 2015)



Results – feed balance

- Higher deficit for crop residues than for grass





Discussion & opportunities for collaboration

- Sharing data

Strengths

Caveats

Livestock data

- detailed description of systems, cohorts, feed requirements
- multiple environmental impacts
- mitigation/improvement options

- animal mobility
- accessibility to biomass
- country specific technical perf.

Biomass data

- coverage & resolution
- time series

- country specific validation
- types of natural biomass
- biomass quality as feed resource



Discussion & opportunities for collaboration

Integrated approaches of rangelands and livestock are critical to food security and sustainability

- Early warning systems and climate change vulnerability monitoring
- Climate smart livestock: mitigation and adaptation
- Biomass modeling in relation with livestock
- Rangeland condition and degradation
- Pilots and validation
- Scenarios: climate, biomass availability, livestock



Thank you