

# Developing tools to quantify sustainability of intensive and extensive ruminant farming systems in Sub-Saharan East Africa

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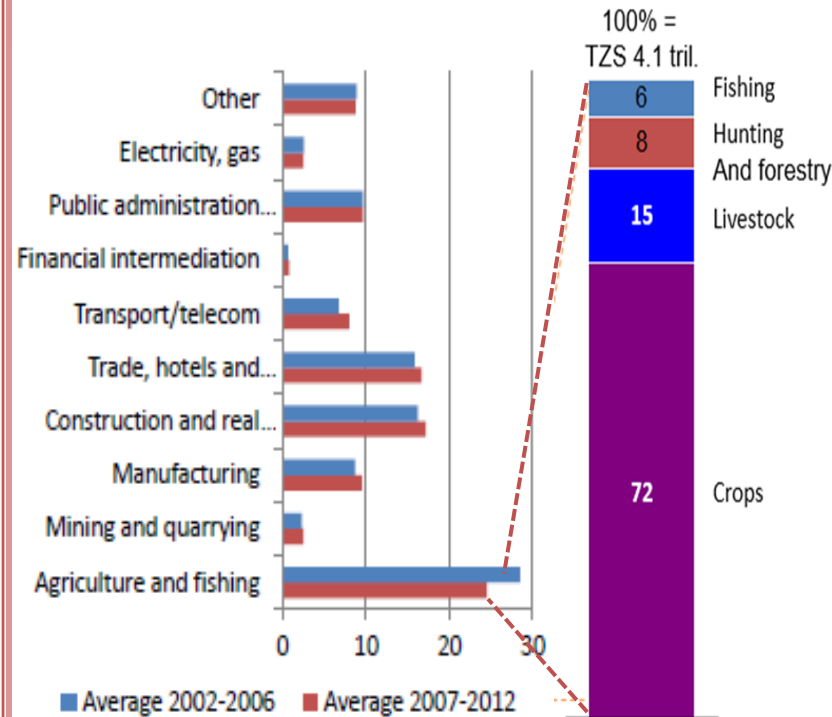
# Rationale for work



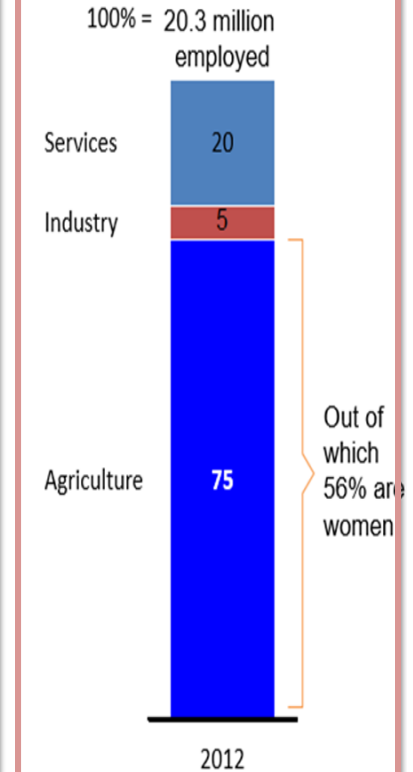
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Tanzania GDP by sector 2002-2012 (%)



Workforce by sector (%)

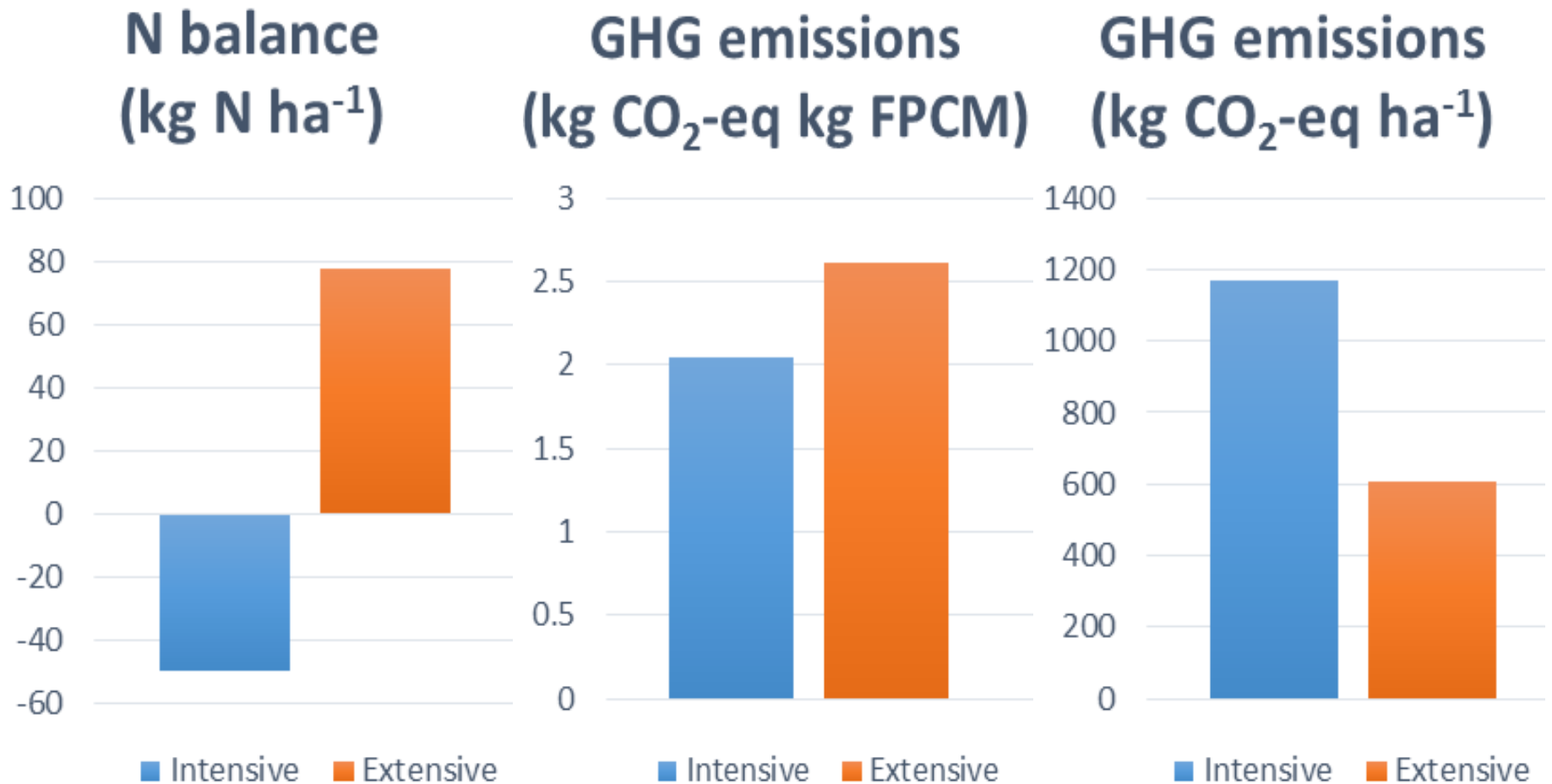


(IMF, 2014 & Tanzanian Ministry of Agriculture Food Security and Cooperatives, 2013)

# CLEANED model



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## Development strategy scenarios

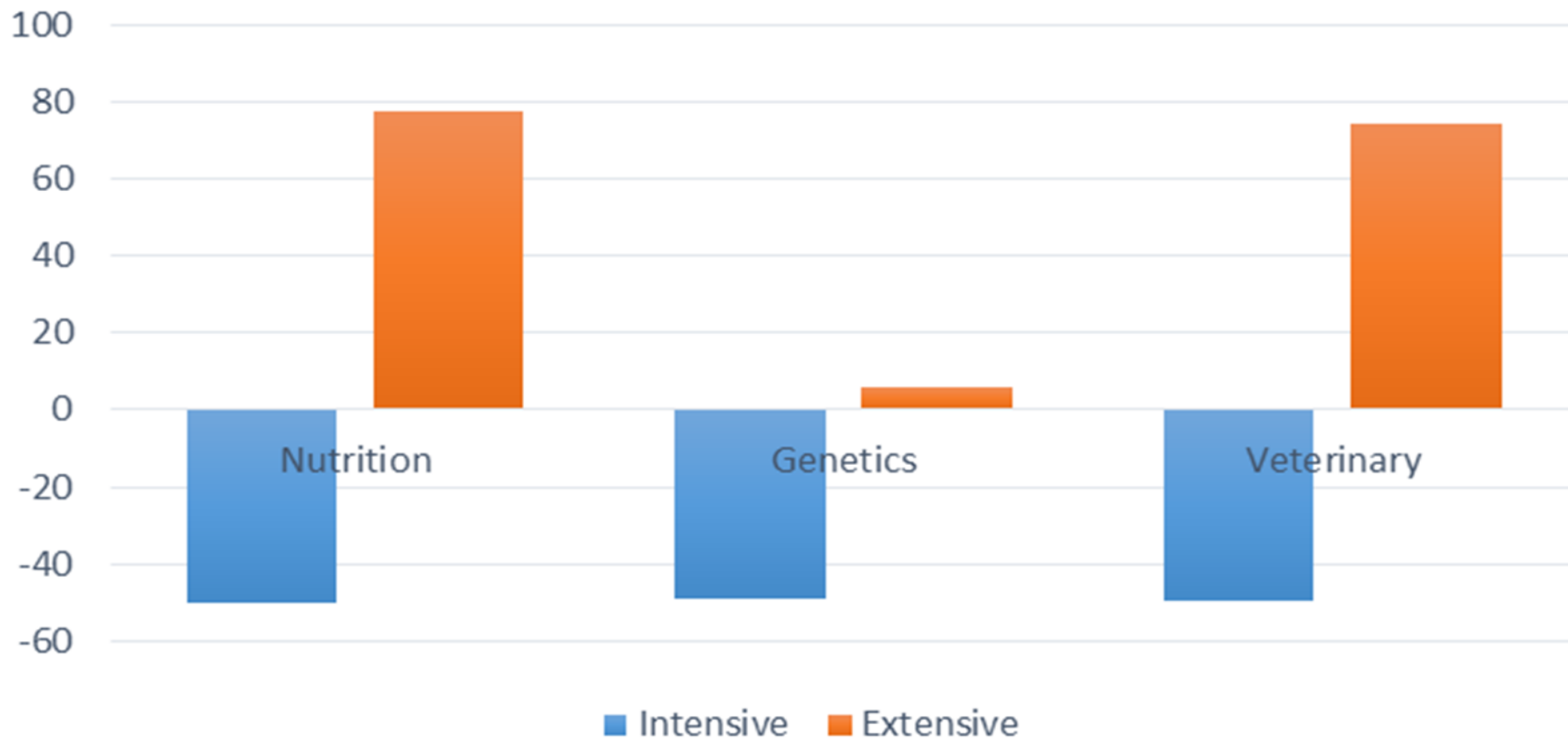
- Greater nutritional provision
- Genetic improvement
- Increased veterinary services

# CLEANED model



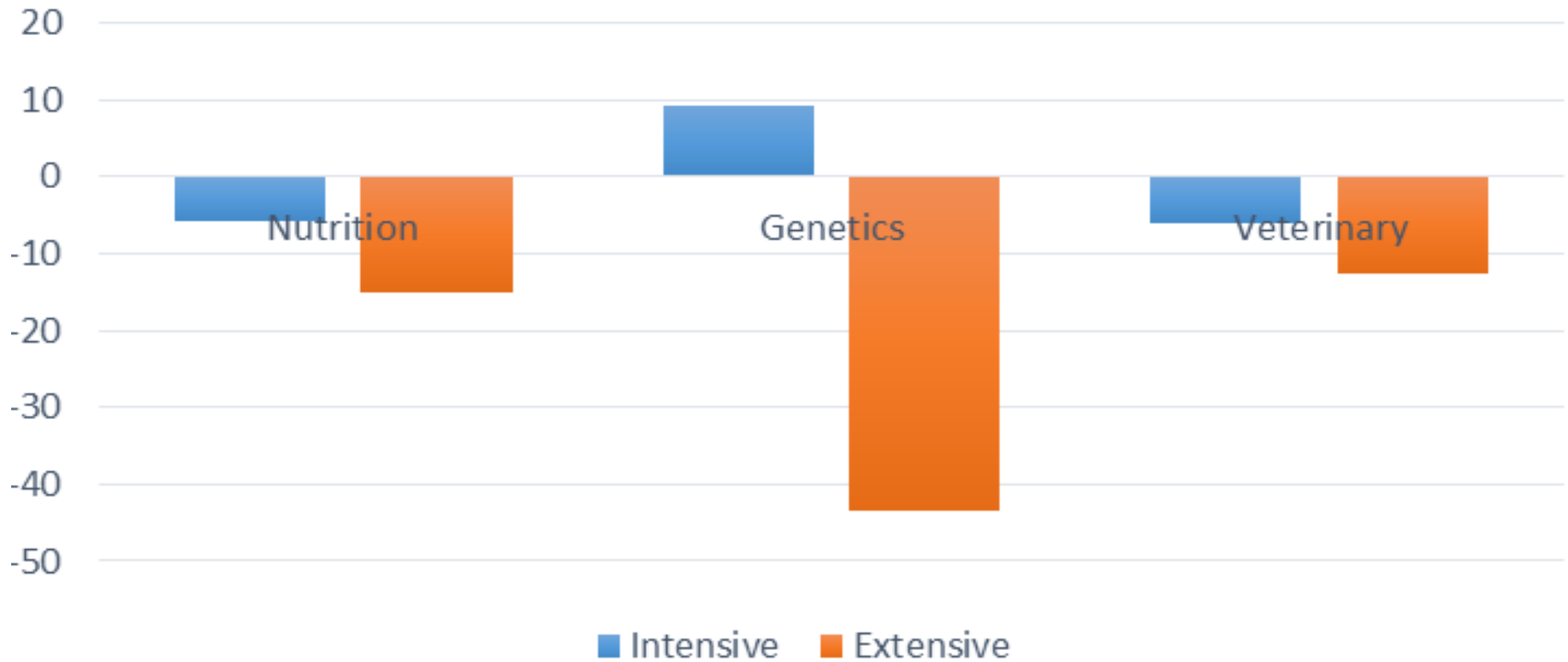
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## N balance (kg N ha<sup>-1</sup>)





## GHG% Change from baseline (kg CO<sub>2</sub>-eq kg FPCM)





# Forage sampling



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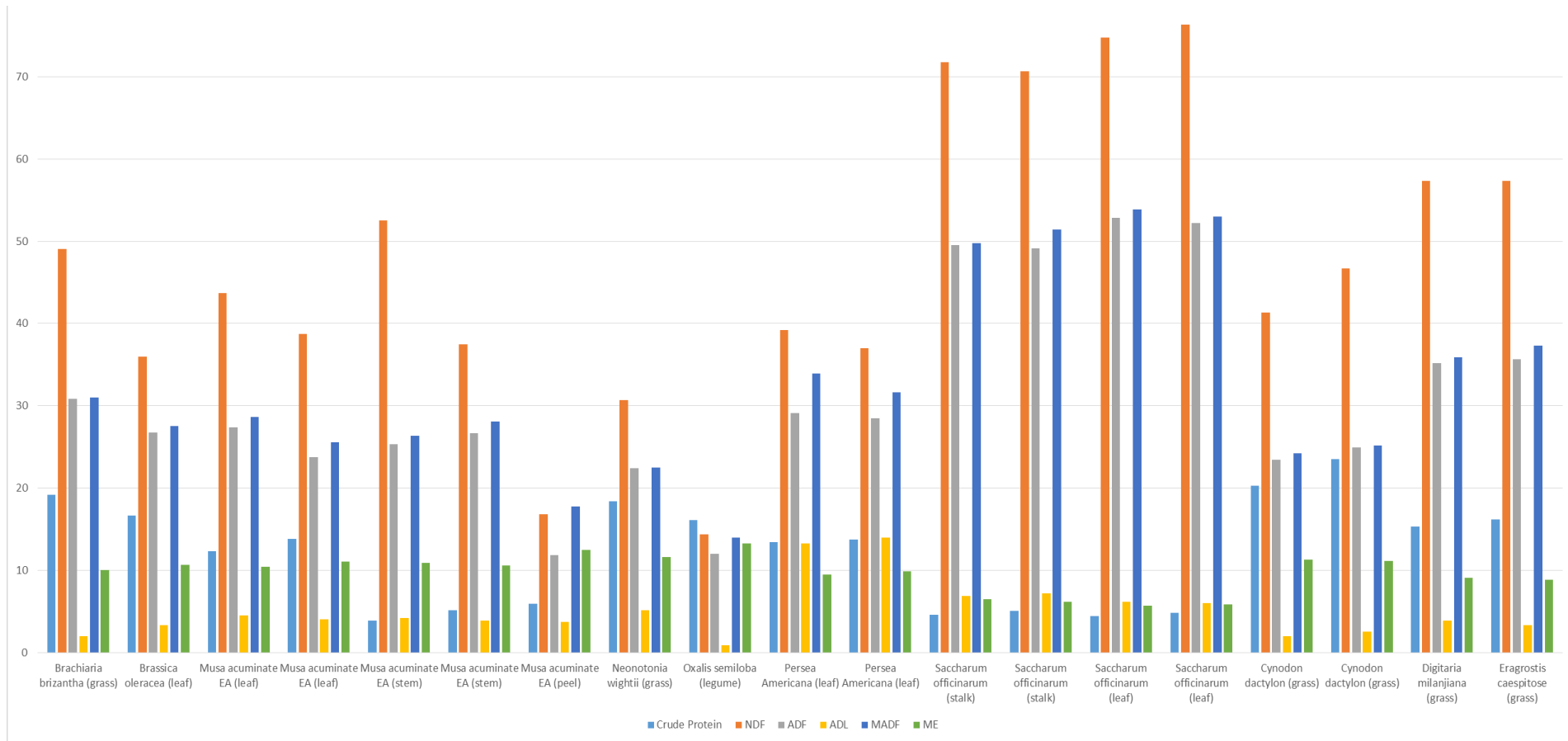
- Several sites, representative of Intensive and Extensive production
- Completed in conjunction with stakeholder interview
- Overt differences evident between two production systems forage
- Difficulties associated with collection



# Initial forage analysis outcomes



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# Initial forage analysis outcomes



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Extensive System Livestock feed item	Percentage of feed basket (%)
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## Wet season

Off-farm grazing on pasture grasses 90

Maize stover 10

## Dry season

Off-farm grazing on pasture grasses 80

Maize stover 20

Intensive System Livestock feed item	Percentage of feed basket (%)
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## Wet season

Brachiaria brizantha and Neonotonia wightii 60

Maize stover 10

Musa acuminata EA 11

Brassica oleracea 4

Assorted straw 15

## Dry season

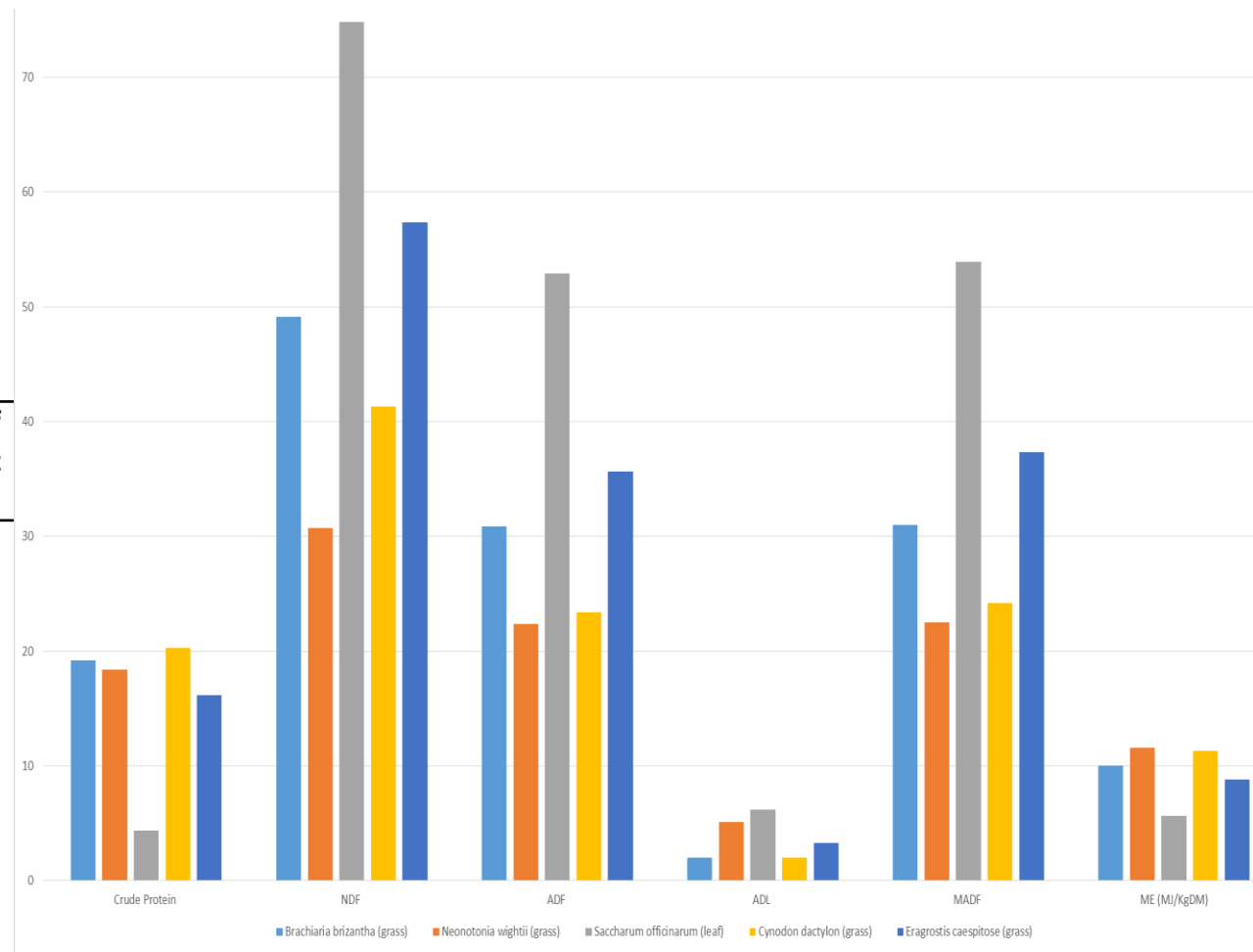
Brachiaria brizantha and Neonotonia wightii 55

Maize stover 15

Musa acuminata EA 10

Avocado leaves 5

Assorted straw 15



# Wider relevance and future work



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- Iterative process of model modification, increasingly real world data
- Variety of limiting factors identified (GOV, land ownership & socio-cultural)
- ‘Grounding’ of development strategies required (basic husbandry & AHW)
- Value of rapid assessment tools for sustainability in smallholder production





# Acknowledgements



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