DecLaRe: Decision support for strengthening land resilience in the face of global challenges

Ruminant keeping and feed resource availability: A case study in Northern Ghana

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General Background

- Mixed crop-ruminant (MCR) keeping is a major source of livelihood for most people in Northern Ghana
- The production system is mainly extensive and characterized by low production
- MCR farmers are faced with feed scarcity seasonally

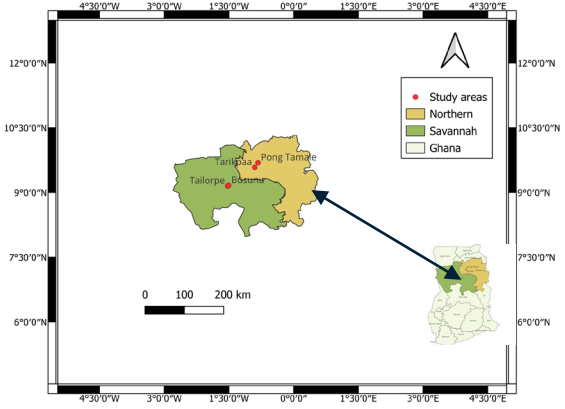


Figure 1: Map of Northern Ghana

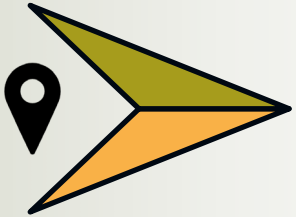
Objectives

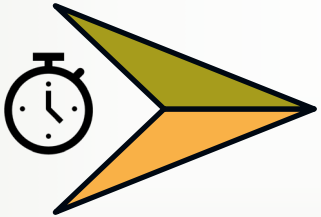
- To evaluate the available feed resources in the Northern and Savannah regions
- To assess the nutritional quality of the available feeds
- To quantify the above-ground biomass yield of feeds in both regions




Materials and Method

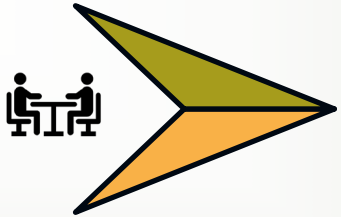
Northern and Savannah regions

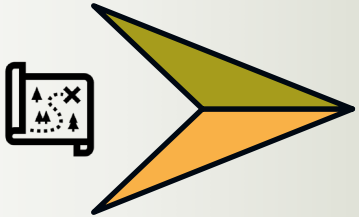




February 2023 – March 2023

Interview with 134 MCR farmers





Map-based interviews

Materials and Method

Above-ground biomassquantification

Harvesting of above-ground biomass

Milling of harvested biomass

Nutritional analysis

DM,OM, CP,NDF, ADF, Ash

Descriptive statistics

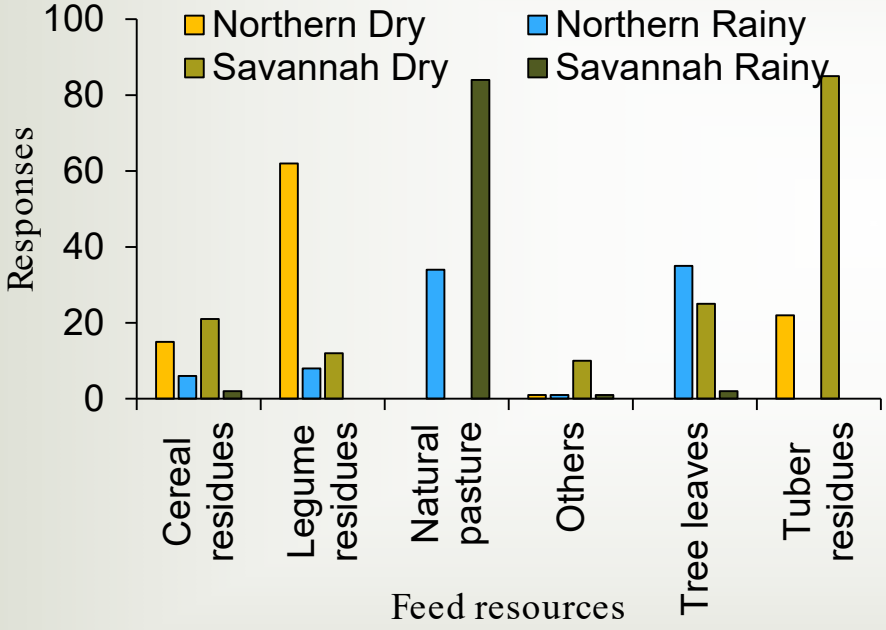
Resultsand discussion

Socio-demographics of MCR farmers in the Northern and Savannah regions

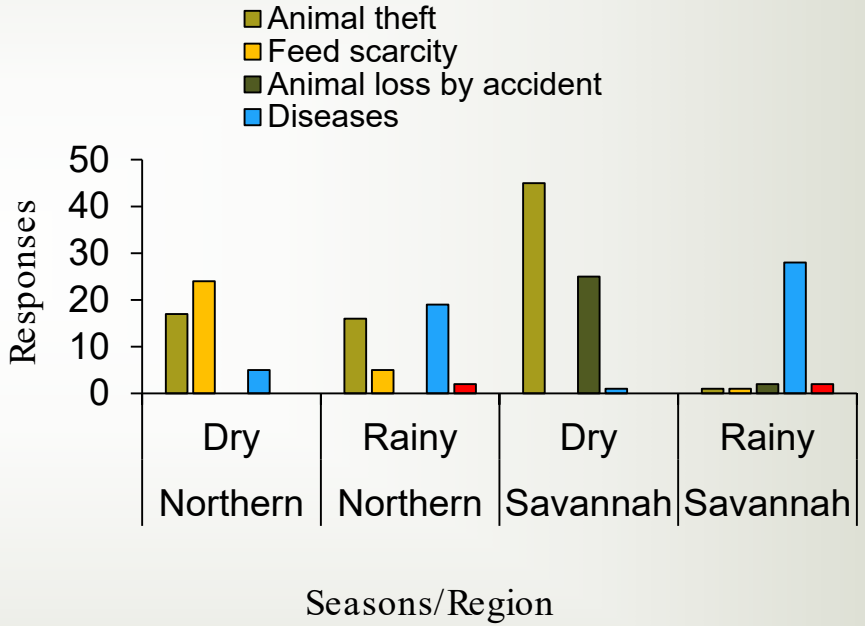
Respondents	Northern region (n=50)	Savannah region (n=84)
Female	4	31
Male	46	53
Average age (years)	44	43
Average household size (HH)	12	8
Area cultivated (ha)	4	3.1
Cattle (TLU/HH)	1.2	1.2
Sheep (TLU/HH)	0.6	0.3
Goats (TLU/HH)	0.4	0.4

Where TLU = Tropical livestock unit
HH = Household

Resultsand discussion



Available feed resources according to season and regions



Challenges faced by MCR farmers in both regions according to seasons

Resultsand discussion

Nutritional Composition (in DM) of feeds from Northern and Savannah regions

Feed	CP (g/kg)	NDF (g/kg)	Ash (g/kg)	ME (MJ/kg)
Northern pasture	80	650	100	8.0
Savannah pasture	70	670	110	8
Groundnutresidues[a]	111	518	99	7.9
Maizestover[a]	39	750	71	6.9
Soybeansresidues[a]	159	470	76	8.6
Ricestraw[a]	82	N/A	251	7.9
Millet stover[a]	96	760	107	7.1
Cowpearesidues[a]	148	490	137	7.8

Where [a] = Data values from Feedipedia

Resultsand discussion

Estimation of crop residues and natural pasture yield in Northern region (NR=50)

Feed type	Yield/HH (kg DM)	Feed/HH (kg/DM)	Feed ME/HH (MJ)	
Groundnut	356	191[c]	1511	
Maize	471	243[c]	1674	
Soyabeans	711	331[c]	2849	
Rice	73	36[c]	283	
Millet	36.5	26[c]	186	
Cowpea	17.3	10[c]	80	
Total crop residues		837	6583[b]	(50%)
Natural pasture				
Total pasture		764	6112	(75%)

Where [b] = Ansah and Issaka (2018)
[c] = Hergoulac'h et al. (2019)

Resultsand discussion

Estimation of crop residues and natural pasture yield in Savanah region (SR=84)

Where [b] = Ansah and Issaka (2018)
[c] = Hergoulac'h et al. (2019)

Resultsand discussion

Estimation of average TLU/HH fed annually in the Northern and Savannah regions

Region	Avg TLU	Annual ME supply of pasture (MJ)	Annual ME supply of Crop residues (MJ)	Annual ME requirement of TLU (MJ)	Delta
Northern	2.3	6112	6583	30441	-23859
Savannah	1.9	5514	4304	25420	-21116

- Feed produced in both regions could supply only 17-22% of metabolizable energy needed for maintenance.

Conclusion and Recommendations

- Ruminants kept by MCR farmers in the Savannah and Northern are underfed annually
- Further research studies are needed to explore alternative strategies, optimize resource use, increase forage production, and enhance sustainability of ruminants keeping on MCR farms

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