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# Intensification of Smallholder Livestock Production through Utilization of Crop Residues for Livestock Feed in Tanzania



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"Solidarity in a competing world - fair use of resources"

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## Introduction

Babati district in Manyara region, Tanzania is a high potential mixed crop livestock production area producing crop and animal sourced foods for major urban areas in northern Tanzania. With expansion of arable land and resultant decline in grazing resources, crop residues are becoming an increasingly important component of livestock feeds and a key livelihood resource in these systems. Although farmers in Babati district already practice diversified farming system, the crop and livestock components co-exist more or less independently from each other. A series of studies were conducted to characterize the use of crop residues for livestock feed as an option for enhancing intensification on smallholder farms.

## Research activities undertaken

- Used the Feed Assessment tool (FEAST) to characterize the types, distribution and use of crop residues in existing livestock production systems in Babati.
- Quantified stover yield on farms (Figure 2).
- Introduced feed choppers through village learning approaches and assessed their performance under farm conditions.

## Key findings

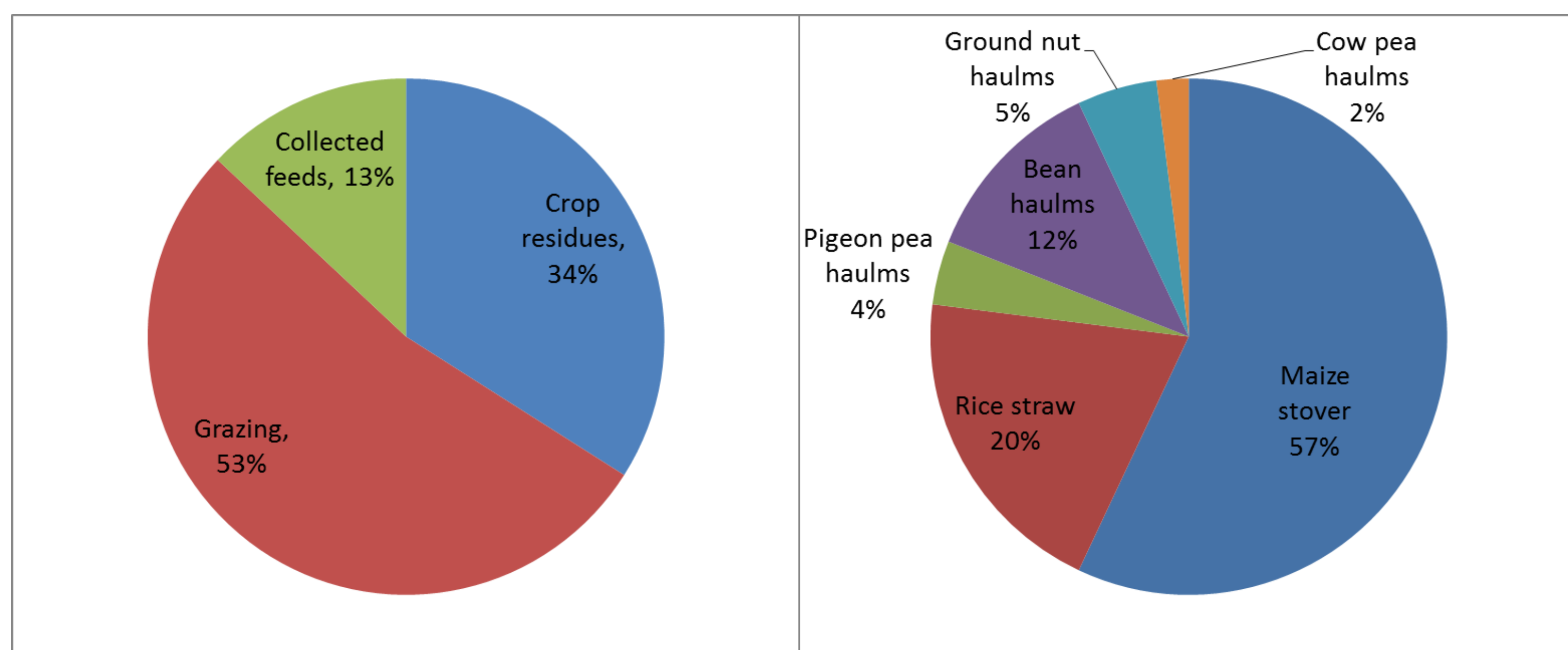
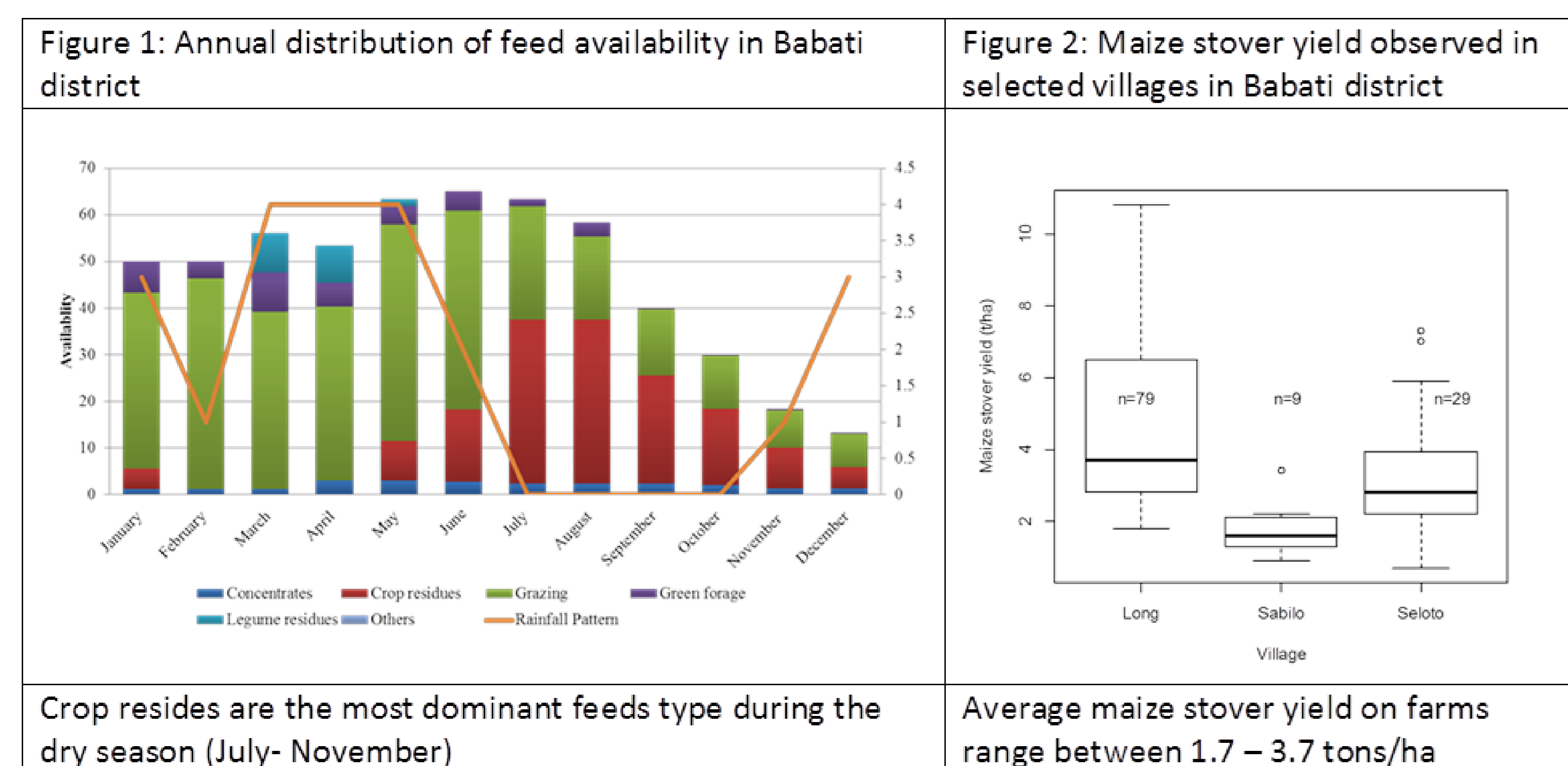


Figure 3a. The contribution of crop residues in general

Figure 3b. The contribution of different types to livestock diets

- Crop residues are the most dominant feed type during the dry season (July- November- Figure 1).
- Average maize stover yield on farms ranges between 1.7 – 3.7 tons/ha (Figure 2), enough to feed a cow for 213 - 463 days (7-15 months).
- Crop residues contribute 34% of the total feeds available on farm in Babati where grazing and collected feeds contributes 53% and 13% of the diet respectively (Figure 3a).
- Maize stover is the most abundant and commonly used crop residue (Figure 3b).
- There is a lot of feed waste on farms due to poor feeding troughs (Plate 1), poor transportation (Plate 2) and poor storage (Plate 3).
- There are highly nutritious legume based crop residues (Table 1).



Plate 3: Un-chopped crop residues stored on a farm



Plate 4: Chopped crop residues stored on a farm

## Testing of feed choppers

- On average, it took two (2) hours less time to chop crop residues when using a forage chopper compared to a machete (panga).
- The forage chopping machine chopped 137 kg/hour of maize stover (Figure 4).
- We successfully demonstrated to farmers in Babati that forage choppers can have a very significant role in reducing forage wastage and labour (time and cost) required to harvest and process feeds.

Table 1: Nutrient composition of crop residues in Babati district

Type of crop residues	Nutrient composition	
	Crude protein % (sd)	INDMD % (sd)
Maize stover	3.62 (1.17)	53.69 (4.26)
Rice straw	3.70 (1.40)	84.87 (2.8)
Bean haulms	7.62 (1.78)	54.13 (3.46)
Groundnuts	16.3 (2.32)	74.17 (2.06)
Pigeon pea	17.60 (2.0)	53.46 (3.58)
Cow pea	15.12 (6.19)	79.94 (11.06)

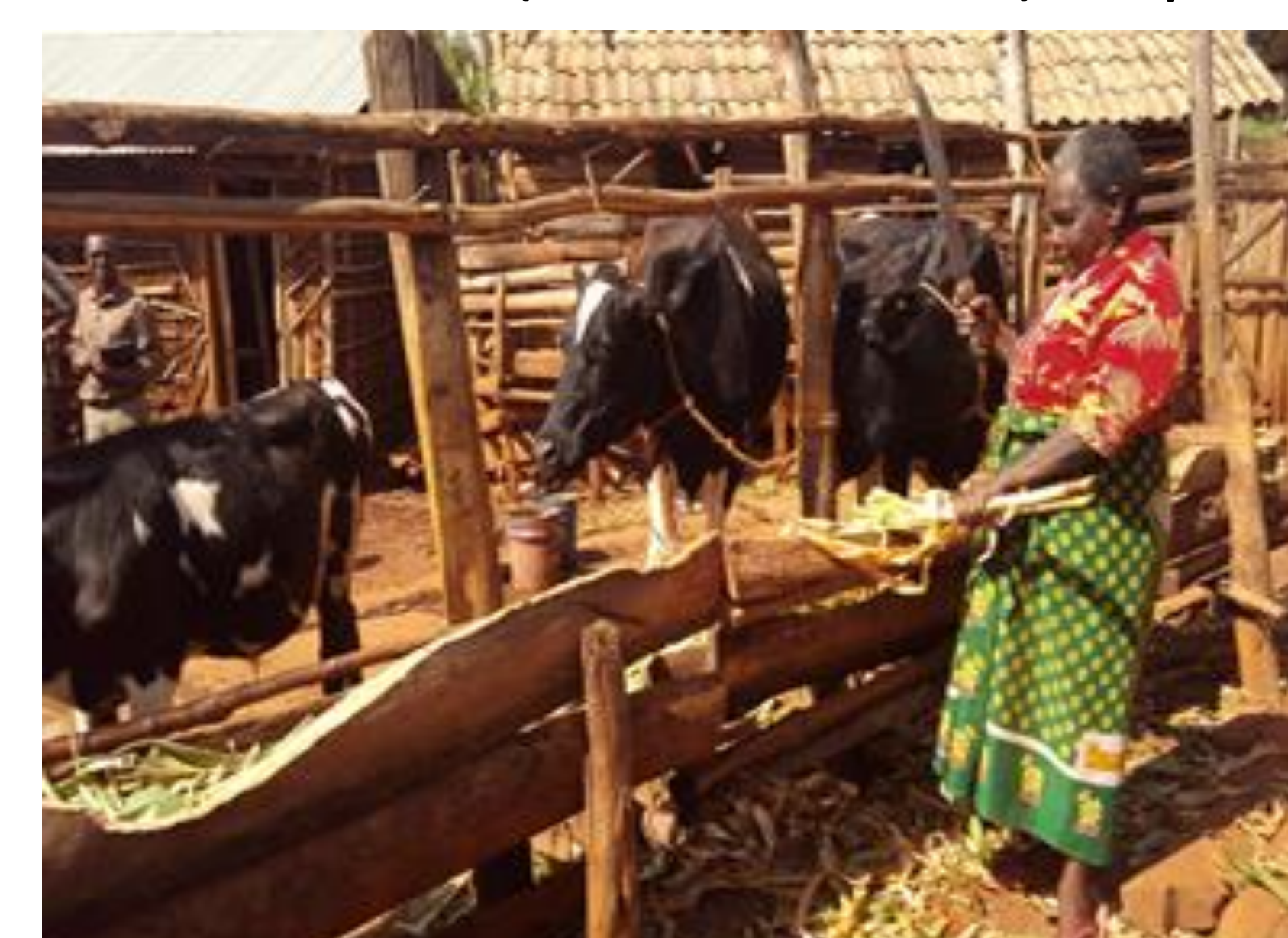


Plate 1: Poor troughs lead to a lot of feed wastage on farms



Plate 2: A farmer transporting maize Stover for feeding cattle

Type of crop residue	Form of residue	Amount chopped (kg/hour)
<b>Crop residues</b>		
Beans/Rice straw	Dry	72
Maize Stover	Dry	137
Napier grass	Green (wet)	400
<b>Grain residues</b>		
Maize	Broken grain	72
Sunflower Cake	Fine flakes	51
Maize cobs	Fine flakes	53

Figure 4: The output capacity of forage of different feed types on-farm



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