

# A decision-support tool for farm planning in integrated crop-livestock systems in southern Mali

Dissa Arouna<sup>1,2</sup>, Sanogo Ousmane<sup>2</sup>, Giller Ken<sup>1</sup>, Descheemaeker Katrien<sup>1</sup>

<sup>1</sup>Wageningen University, Plant Production Systems, P O Box 430, 6700 AK Wageningen, Netherlands

<sup>2</sup>Institut d'Economie Rurale (IER), ESPGRN-Sikasso, P.O. Box 186, Sikasso, Mali.



## Problem statement

The lack of good quality pastures, during the critical drought period (i.e. March up to June) in southern Mali, leads to feed shortages and weakening of draught animals. The limited strength of these animals for manure transport and ploughing may jeopardize timely cultivation and hence the crop performance. Farmers can mitigate this risk by securing access to feed beforehand, e.g. by producing enough fodder on-farm. However, most farmers lack the advance planning capacity and the knowledge on the required fodder amounts and quality.

## Introduction

Farmers in southern Mali use different livestock feeding strategies over the year (Table 1). From July to December, animals are mainly fed through free grazing and from January to June, other feeding strategies (e.g. complementing) are often used. Usually, farmers do not plan the production of sufficient animal feed through growing high quality fodder in the rainy season (June-November).

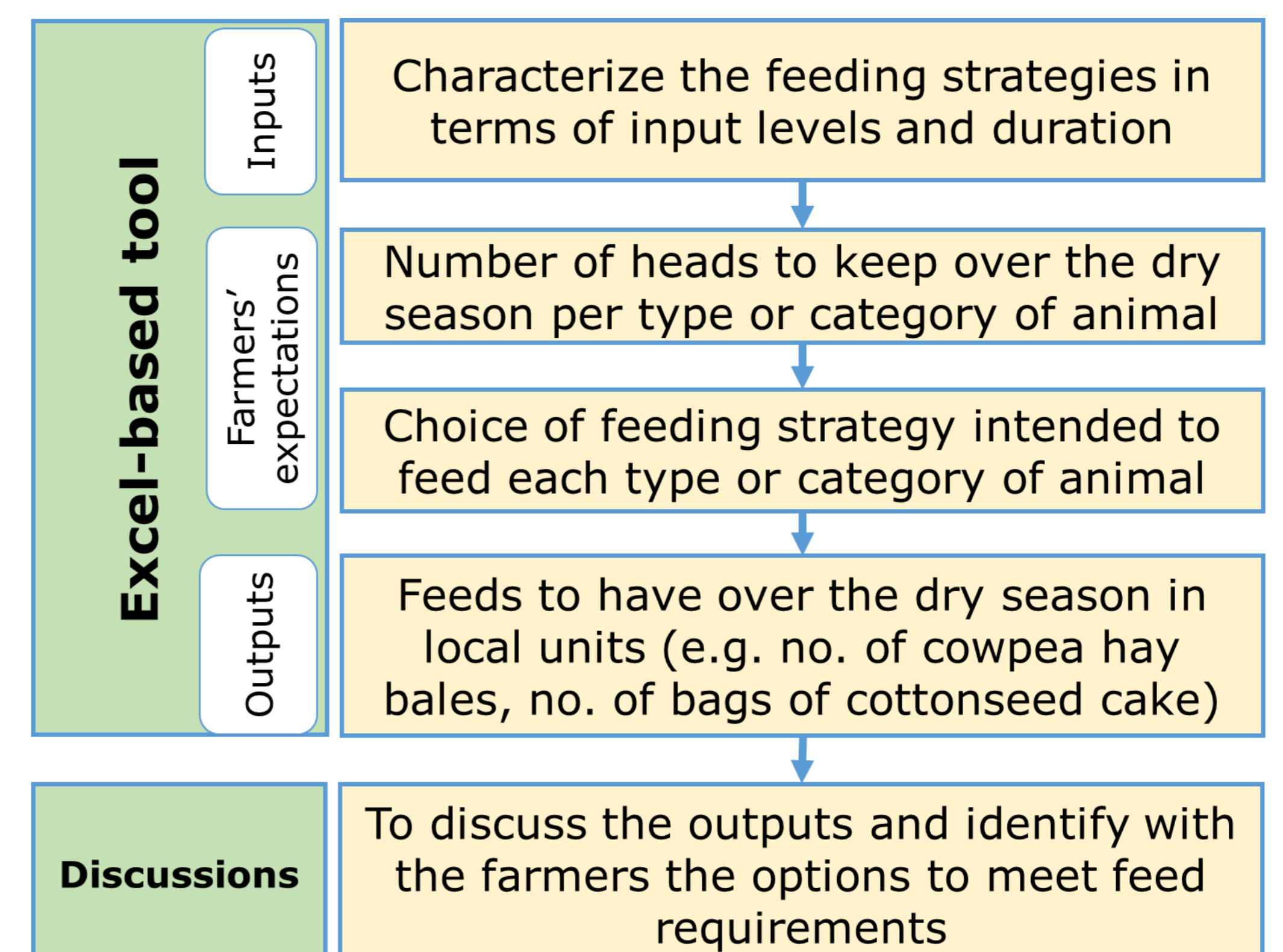
**Table 1.** Strategies used to feed the livestock in southern Mali

Feeding strategies	Feeding regimes	Periods	Animal types
<b>Transhumance</b>	Free grazing (FG) in remote pasture lands	April-November	Cows and other cattle
<b>Free grazing</b>	FG in local pasture lands	July-March	All animals
<b>Complementing-low</b>	Complementing with fodder after the FG	January-June	Cattle and donkey
<b>Complementing-high</b>	Complementing with fodder + concentrates after the FG	April-June	Oxen, milk cows, and donkey
<b>Stall-feeding</b>	Feeding with fodder + concentrates in the stall	Any time over the year	Cattle, donkey, and sheep

## Objective

To develop a decision support tool, adapted to the local context of southern Mali, and explore how it can help farmers to plan for sufficient animal feeds to be used during the dry season.

## Methodology



## Results

**Table 2.** Feeds to be planned per animal and per feeding strategy (amount per season)

Feeding strategies	Types of feeds	Oxen	Milk cows	Other cattle	Don-key	Fattened sheep	Other sheep	Goat
<b>Complementing-low regime</b>	Concentrate (bag)	0	0	0	0	0	0	0
	Stover (cart load)	4.5	4.0	5.4	3.6	0.5	0.5	0.5
	Hay (bale)	67	67	0	0	11	11	11
<b>Complementing-high regime</b>	Concentrate (bag)	4	5	4	0	2	0	0
	Stover (cart load)	2.0	1.8	2.0	1.3	0.5	0.5	0.5
	Hay (bale)	101	90	101	68	23	23	23
<b>Stall-feeding regime</b>	Concentrate (bag)	5	6	5	0	2	0	0
	Stover (cart load)	2.7	2.7	2.7	2.7	0.5	0	0
	Hay (bale)	135	135	135	135	23	0	0

It's assumed that 1 bag= 40 kg, 1 cart load= 100 kg, and 1 bale= 2 kg.

**Table 3.** Average amounts of feeds to provide throughout the dry season for an average HRE-LH (High Resource-Endowed with Large Herd) farm type

No. of heads of animals	Oxen	Milk cows	Other cattle	Don-key	Fattened sheep	Other sheep	Goat	Total amounts	Total feeds in area (ha)	Total feeds in cash (F CFA)
<b>Common used feeding strategies</b>	Compl.-high	Compl.-high	Compl.-low	Stall-feeding	Stall-feeding	Compl.-low	FG			
<b>Concentrate (bag)</b>	20	23	0	0	4	0	0	46	-	301275
<b>Stover (cart load)</b>	12	9	102	9	1	10	0	143	4	-
<b>Hay (bale)</b>	608	450	0	459	54	173	0	1744	1	261563



## Conclusion

The tool proved to be powerful to launch deep discussion with farmers, e.g. on land, labour, and cash issues, and to share information, e.g. yields of fodder crop, that helped the decision-making, for better integrated farm management.

## Acknowledgements

This research is co-financed by the McKnight Foundation through the project 'Pathways to Agroecological Intensification of Crop-Livestock Farming Systems' and the AfricaRISING-WA. We thank farmers for their highly valued cooperation.