

Reproductive and growth performance of extensively managed goat herds in southwestern Madagascar

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Introduction

Goat keeping plays a key role for people's livelihoods in semi-arid southwestern Madagascar (Fig. 1, 2). Yet, the extensive husbandry system is liable to climatic, physical and economic constraints and thus bears risks of loss for the herd owners.

→ We investigated growth and reproductive performance of goats along with herders' culling strategies to determine herd dynamics and opportunities for economic development.

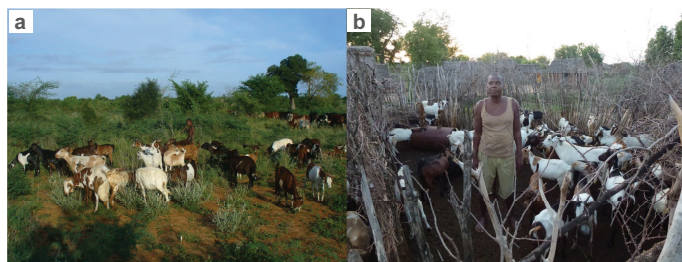


Figure 2. (a) In the study region, goats are mostly herded by little boys. (b) Local goat farmer and his flock within the animals' night pen

Results

- Mean body weight was 28.7 kg (SE 0.3) for non-pregnant adult does (n = 430) and adult bucks (SE 0.8; n = 173). No differences were found between animals of both sexes in their age-weight relation (p > 0.05; Fig. 3).
- Average age at first parturition is 22.1 (SE 0.7) and average kidding interval 12.3 (SE 0.5) months.
- Does give birth to 1.3 (SE 0.02) kids per litter of which 67.8% are single, 31.0% twin and 1.2% triplet births.
- Offspring mortality is highest within the first four months of life, resulting in 15.2% herd loss (Fig. 4).
- Culling of young goats mostly occurs after reaching adolescence, affecting 33.5% of the age class 10-24 months.
- Economic modelling shows that households are able to earn on average 11 € from one doe and her offspring per year (Table 1). Milk consumption and sale contribute only marginally to household revenues.

Conclusions

Goat keeping is economically profitable in the study region due to satisfying reproductive performance, low labor and fodder costs.

Potential for improvement still exists concerning reproductive and economic performance.

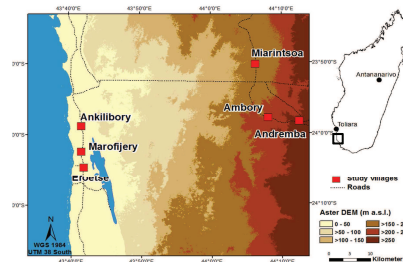


Figure 1. Location of the six study villages

Materials and Methods

- Body weight and age was recorded from 778 female and 358 male animals at the end of the rainy season in February and early April 2013.
- Interviews were conducted with 40 herd owners in 6 villages to determine the progeny history of 449 does and their 1,241 kids.
- A Monte Carlo simulation model was used to assess the economic performance of goat keeping with cost-revenue calculations based on the herd survey and socioeconomic data from interviews and market monitoring.
- For calculating revenues, sales and own consumption of offspring, milk and breeding females were valued with market prices.

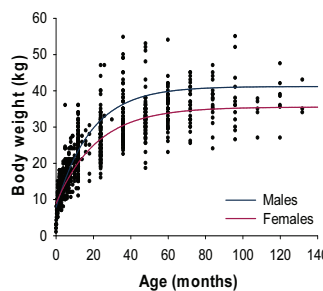


Figure 3. Bodyweight of growing male and female goats

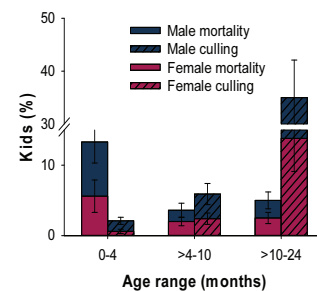


Figure 4. Herd loss of male and female offspring

Table 1. Cost-revenue calculation for goat keeping based on a Monte Carlo simulation model

Item	Min	Mean	Max
Herd size (animals)	2	18	101
Reared kids (animals/GU ¹ *year)	0.4	1.2	3.6
Revenues (€/GU ¹ *year)	4	19	57
Female offspring (%)	34	30	39
Male offspring (%)	21	25	25
Replacement of does (%)	45	34	22
Milk consumption and sale (%)	0	11	14
Costs (€/GU ¹ *year)	1	8	21
Replacement of does (%)	100	98	61
Herding labor (%)	0	2	39
Contribution margin per goat unit (€/GU ¹ *year)	-7	11	45
Contribution margin per labor day (€/day)	-0.5	0.5	8.3

¹ GU = Goat unit (female mother goat + offspring younger than 22 months)