

# An Analysis of Smallholder Livestock Strategies in the Central Highlands of Kenya

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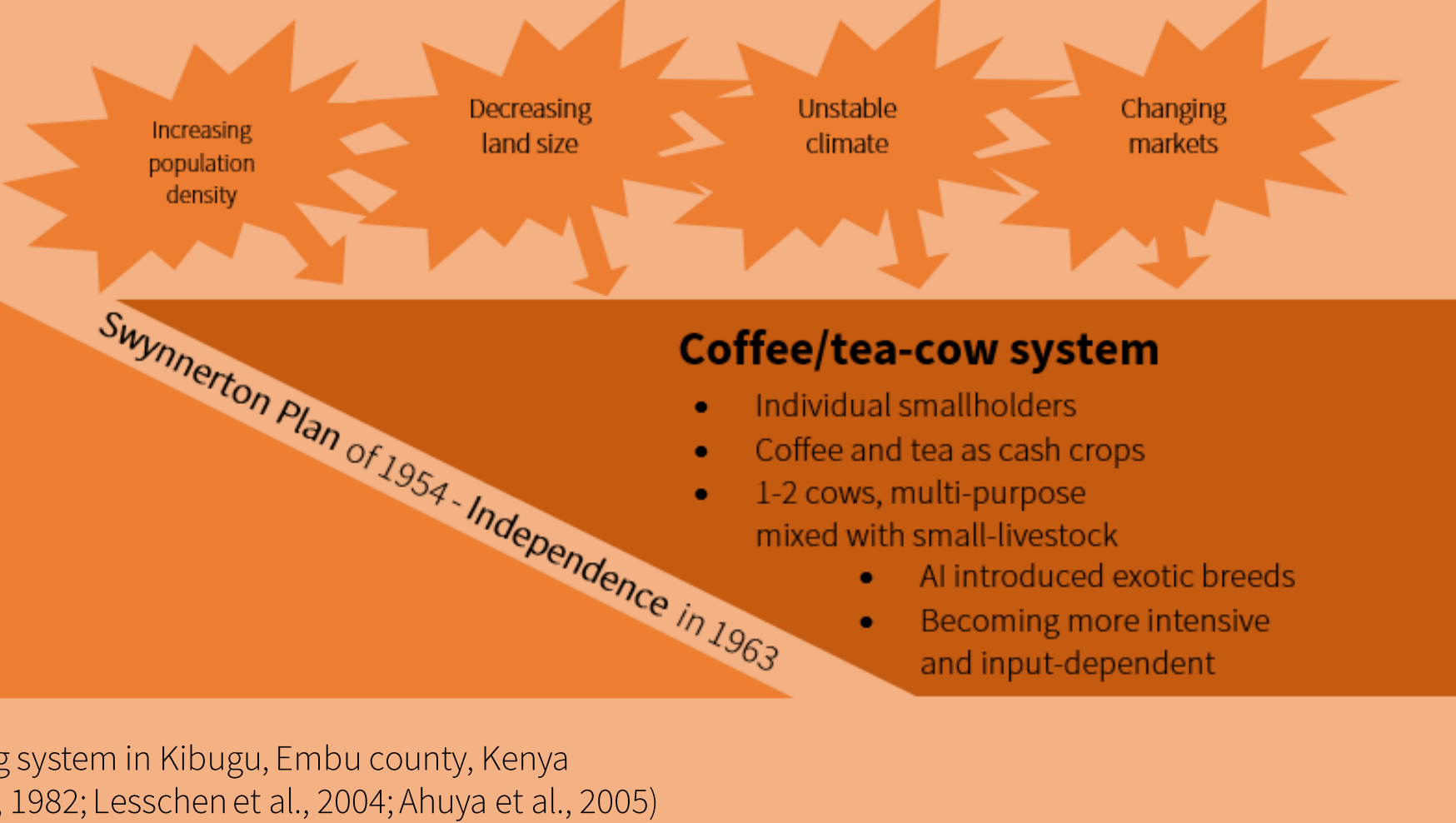
## Background



- Communal land ownership
- Free grazing of indigenous, local Zebu cattle

### Subsistence Farming

Figure 1: Evolution of the farming system in Kibugu, Embu county, Kenya (adapted from Jahnke & Jahnke, 1982; Lesschen et al., 2004; Ahuya et al., 2005)



- Mixed crop-livestock system
- 1-2 cows at center of system
- Trend towards more and higher pedigree cows
- FARM Africa, GTZ and others have implemented successful community-based goat breeding programs elsewhere in Kenya



## Mixed Methodology Approach

- 3 week field course in Kibugu, Embu County
- Participatory Rural Appraisal (PRA) activities, such as livestock rankings and seasonal calendars, were incorporated into interviews (see photo)



PRA exercise with farmer: Livestock scoring matrix

Transect walks

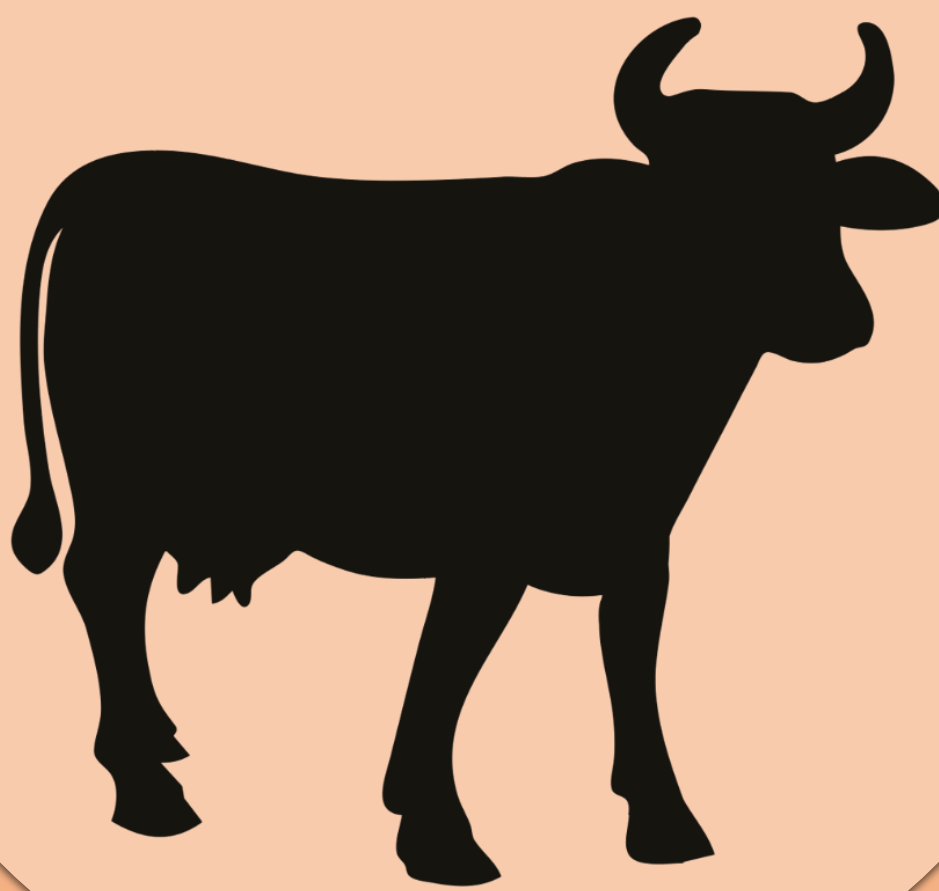
Questionnaire (n=93)

Farmer Interviews (18) + Participatory tools

Extension worker interviews (4)

## Research Question

What are the livestock strategies in Kibugu, Kenya and what are the drivers behind these strategies?



Many farmers were concerned about decreasing land parcel size. Livestock inputs, especially feed, are becoming more expensive. Unseasonable drought has restricted feed resources and further constrained smallholders.

Despite these challenges, farmers prefer to raise resource-demanding cattle breeds such as Friesians and Ayrshires. However, many farmers struggle to secure consistent, high quality feed, and the cows are unable to reach their production potential in this environment.



Curious crossbred dairy cow in the zero-grazing crop-livestock system of Kibugu, Kenya

- The average farmer in Kibugu has:
- 1 acre of land
  - Monthly income <10000 KSH (<100 USD)
  - 5 member household
    - 2 cows
    - 6 chickens
  - 0-1 goats (for meat & insurance)

In comparison to cows, dairy goats have several advantages:



- Lower space and resource demand
- Better drought adaptation
- Richer milk
- Earlier, more frequent offspring to sell or keep
- Option to breed with rotating buck
- Cheaper to purchase
- Faster return on investment
- 2x to 4x's higher milk price
- Emerging market, increasingly demanded by hospitals



Drawing of typical smallholder farm in Mt. Kenya region (edited) (Ortiz-Gonzalo et al., 2017)

**Why do farmers do this?**  
Having cows, especially the high-yielding, exotic Friesians, is a sign of success and social status. This aspect seemed to outweigh the cow's disadvantages, such as difficulties and high costs of care and feeding. Thus, we found that societal norms played a powerful role in dictating farmers' livestock strategies.

**Why don't farmers do this?**  
Many farmers in Kibugu associate goats with a lower social status. Farmers seemed to lack knowledge of goat husbandry techniques and were not familiar with the advantages of goats. Farmers may lack the financial capital needed to adopt or expand goat production. There is neither a well-established market for goat's milk, nor any marketing cooperatives for farmers.

Despite these advantages, we found only two dairy goat farmers in Kibugu. Thanks to them, we saw that a well-designed agroforestry system, incorporating leguminous fodder trees such as *Calliandra* with on-farm resources, can support strong dairy goat production.

## Conclusion

Cows are of high significance in the tea/coffee-cow farming system of Kibugu: MILK, MANURE, SOCIAL RANK. However, the growing constraints faced by smallholders challenge the system's long term sustainability. Dairy goat production in Kibugu has been hampered by internal and external constraints.

*"The cow is always there..."*  
– Kibugu farmer

After interviewing some pioneering goat farmers we believe that goats have the potential to provide many benefits to farmers lacking in land and resources. To open up this avenue to interested farmers, a **holistic approach**, combining legislators, NGOs, researchers, and, most importantly, the farmers themselves, could be taken:

Farmers joining together into cooperatives

Increased extension funding to train more farmers

Research on sustainable, community-based goat breeding techniques

## References

Ahuya, C. O., Oleko, A. M., & Peacock, C. (2005). Developmental challenges and opportunities in the goat industry: the Kenyan experience. *Small Ruminant Research*, 60(1), 197-206.  
Jahnke, H. E., & Jahnke, H. E. (1982). Livestock production systems and livestock development in tropical Africa (Vol. 35). Kiel: Kieler Wissenschaftsverlag Vauk.  
Lesschen, J. P., Stoerovogel, J. J., & Smaling, E. M. A. (2004). Scaling soil nutrient balances. Enabling mesoscale applications for African realities.  
Ortiz-Gonzalo, D., Vaast, P., Oelofse, M., de Neergaard, A., Albrecht, A., & Rosenstock, T. S. (2017). Farm-scale greenhouse gas balances, hotspots and uncertainties in smallholder crop-livestock systems in Central Kenya. *Agriculture, Ecosystems & Environment*, 248, 58-70.

## About the Authors

Emily from the USA (B.A. Environmental Studies) and Antonia from Germany (Sustainable Agronomist) study **Sustainable Development in Agriculture** as part of an ERASMUS-Mundus Joint Master's Degree with the University of Copenhagen and Montpellier SupAgro. They are presenting their research results from a one-month field work course in Kenya. The research was conducted by an international and multidisciplinary team of students (Veterinary Medicine, Anthropology, Environment and Agronomy).

## Acknowledgements

Prof. Mutembei, University of Nairobi  
Ebbe Prag, Roskilde University  
Prof. C. P. Hansen, University of Copenhagen

