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“Solidarity in a competing world —  
fair use of resources”

## Borana Cattle Reproductive Performance and Modelled Herd Development under Different Restrictions of Mobility

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### Abstract

Mobile pastoralism on communal grazing land in arid and semi-arid regions strategically exploits spatial and temporal variability of pasture resources. Since decades, Borana pastoralists in southern Ethiopia employ seasonal mobility to match livestock nutritional requirements with available grazing resources at any given time, and have developed sophisticated short and long term grazing itineraries. In recent times, however, seasonal mobility is decreasing drastically due to population growth, land privatisation, and governmental regulation. Livestock is the only asset under the pastoralists' full managerial control. The herd is an autopoietic system, renewing itself within the production cycle. At the same time, it is the pastoralists' capital asset, which transforms grazing into surplus and potential offtake, generating return on capital investment often as high as 20%. The generated products, goods, and services are traded (monetary income), bartered, and serve home consumption. Livestock reproductive performance being at the base of this, the present study aimed at analysing Borana cattle reproductive performance and demography under different restrictions of mobility.

Progeny history questionnaires were used in three regions of the Borana rangelands ( $n = 169$  Dirre,  $n = 126$  Malbe and  $n = 110$  Golbo) to derive mortality and culling rates, age at first parturition, parturition interval, and litter size as determinants of herd development. Data were analysed to gain information on cattle reproductive performance and demography using Excel, LiDaSt and the bio-economic herd model PRY/HerdLife.

Significant differences were found between the regions. The most viable population of cattle of the three regions is in Malbe compared to Golbo as a medium and Dirre as the most difficult area of cattle keeping. Modelling herd development revealed the same trend and showed a potential annual herd expansion rate of 8.5% for Dirre, 11.4% for Golbo and 13.4% for Malbe. Cattle reproductive performance has decreased compared to earlier findings from other studies. Since mobility is most restricted in Dirre due to high population density and regulations, we conclude that reduced seasonal mobility has a decisive share in the decrease of reproductive performance and potential herd growth.

**Keywords:** Cattle, modelling, pastoral, PRY, reproductive performance