

# **Cattle herd vulnerability to rainfall variability: responses to two management scenarios in southern Ethiopia.**

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## **Abstract**

We examine how the system of grazing management of cattle in savanna rangelands affects the herd response to drought. We have used long-term time series data to evaluate the effects of management on drought-induced cattle mortality using traditional livestock management practices. There was no control of stocking densities, as compared to a government ranch where stocking densities would be adjusted in accordance with available pasture. We tested the responses under two scenarios. Scenario 1: Response of cattle herds to inter-annual rainfall variability (IRV) under a regulated grazing management system; this provides more reliable predictions of cattle population and performance in terms of herd mortality and calving rates than does the communal land use system. Scenario 2: Regardless of the management system, similar trends in cattle populations will be observed in response to IRV. The results of the study showed that fluctuations in cattle numbers, herd mortality and calving rates were highly correlated with IRV, with stronger linear impacts in accordance with scenario 2. In both management systems, cattle herd sizes and calving rates declined during periods of drought, followed by slow recovery. Cattle populations in Borana rangelands in southern Ethiopia did not recover for a period of two decades. We conclude that a management system based on control of stocking densities did not improve herd survival, as compared with traditional drought management strategies. This contradicts common expectations. Increased drought frequencies aggravated cattle mortality and lowered calving rates. The implication of the findings is that regardless of adjusted stocking density, livestock populations in the arid savanna ecosystems of southern Ethiopia remain at risk from climate change.