

MASON HerderLand: Modeling Origins of Conflict in East Africa

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HerderLand is an agent-based model of the people and environment in the Mandera Triangle area of Eastern Africa developed to address the causes of conflict in the area. With it we have conducted three sets of experiments varying the major environmental parameters we believed would affect conflict in the region.

The first set of experiments modeled conflict among herdsmen of two clans over resources necessary for survival. Herders struggle to keep their herds fed and watered in the data-driven environment with seasonal cycles. With the rather basic set of behaviors, herders came into conflict over limited resources and one clan was eventually eliminated. We found that greater environmental scarcity led to faster domination by a single group. At the same time, we noted that there was tremendous variability from run to run.

In the second set of experiments, we varied the rainfall. Climate variability influenced the equilibrium of an otherwise relatively stabilized landscape and droughts immediately and non-linearly affected its carrying capacity. With normal rainfall, the sporadic conflict appeared completely random. Significant reductions in population caused by all of the drought patterns tested resulted in cooperation and conflict diminished but both also increased dramatically with the population's recovery.

In the third set of experiments, some of the traditional graze land was unavailable due to privatized farming. Unexpectedly, the introduction of farmers did not severely effect on the carrying capacity of the region for herders and, when including the farmers in the overall carrying capacity, it actually increased by almost a factor of two. The introduction of farmers also appeared to have provided a barrier between the two modeled herder clans reducing the previously seen trend toward hegemony of a single group.

Our model forecasts the effects of natural disasters and can inform aid efforts for the people of the area.