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CHANGING TRENDS IN CLIMATE AND LIVESTOCK GRAZING RESOURCES IN KAPOETA, SOUTH SUDAN

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ABSTRACT

The major challenge facing livestock production in Kapoeta is inadequate pasture availability exacerbated by unreliable rainfall distribution, droughts and land cover change. First, the study determined the trends of rainfall and temperature variations, climate extremes between 1984 and 2016. Secondly, the study determined the absolute, temporal and spatial changes in livestock grazing resources over the same period. Thirdly, the study assessed the coping and adaptation strategies of the pastoral communities to overcome extreme changes in climate and grazing resources. Regression analysis was used to determine the trends of rainfall and temperature variations between 1984 and 2016. Geographic Information System (GIS) and Remote Sensing software that employed supervised and unsupervised classification was used to determine land cover change between 1984 and 2016. Normalized Difference Vegetation Index (NDVI) was used to determine the changes in pasture density and distribution between 1984 and 2016. A cross-sectional household survey of 164 pastoralists was conducted using a semi-structured questionnaire between March and April 2016 to document their perception of climate change and its challenges, identify coping and adaptation strategies of pastoralists to climate variability and pasture scarcity. The results indicated that, the mean annual rainfall was 146.6±50.33 mm with a minimum and a maximum rainfall amount of 54.50 mm and 307.65 mm between 1984 and 2015. Although there was non-significant ($P>0.05$) reduction in mean monthly rainfall variation, the trend in mean monthly rainfall was decreasing between 1984 and 2016. Conversely, the maximum monthly temperature increased by 1.9 degree Celsius between 1984 and 2016. Concurrently, there was a loss of 4969.9 Km^2 (13.59 percent) of grassland and 1208.9 Km^2 (3.3 percent) of shrubs and thickets between 2000 and 2016. NDVI results indicate a decrease in grass cover, shrubs and thickets between 2001 and 2016. The cross-sectional study indicated that most pastoralists were aware of the change in climate (63 percent) and attributed it to burning and deforestation (67 percent), which resulted in rainfall shortages (31 percent), inadequate pasture (19 percent) and frequent droughts (15 percent). The majority of the pastoralists (66 percent) used migration as their main coping strategy to pasture and water scarcity, while 40 percent cited changing from rearing cattle to sheep and goats. The study revealed a change in climate and loss of livestock grazing resources between 1984 and 2016, exhibited by reduced rainfall amount and increased temperature, and reduced grassland, shrubs and thickets. Therefore, there is an urgent need for improved management of the livestock grazing resources in Kapoeta.