

Full Length Research Paper

Drought monitoring in Kenya: A case of Tana River County

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Standardized Precipitation Index (SPI) is used to assess past, present and projected drought conditions while Mann Kendall trend test and coefficient of variability is used for trend analysis. Observed data from National Meteorological and Hydrological Centre in Kenya and simulated data based on Special Report on Emission Scenarios (SRES) A1B and A2 from Providing Region Climate for Impact Studies (PRECIS) Model and Representative Concentration Pathways (RCP) RCP 4.5 Wm⁻² and RCP 6.0 Wm⁻² from Commonwealth Scientific and Industrial Research Organization (CSIRO) were used. Observed datasets (rainfall and temperature), projected temperature (A1B and A2, RCP 4.5 Wm⁻² and RCP 6.0 Wm⁻²) and rainfall (A2 and RCP 6.0 Wm⁻²) all showed monotonic trend. A1B scenario had no significant trend. Decreasing patterns observed from SPI values based on observations showed increase in dry conditions. Although projected rainfall showed a decreasing trend, the frequency and magnitude of drought events increased under all future scenarios. Risk analysis based on observed data showed that north and central region of Tana River county were susceptible to intense droughts conditions and projected shift northwards under all scenarios. The susceptibility of the region to drought conditions is thus expected to increase conflicts due to limited water resources, pasture and food insecurity in the region and thus limit achievement of Kenya's long term development envisioned in the Vision 2030.

Key words: Climate change, drought, livestock production, scenarios, semi arid.

INTRODUCTION

Climate exerts a significant control on the day-to-day socio-economic development (IPCC, 2007). Climate extremes such as droughts and floods are strongly influenced by both small- and large-scale weather patterns, modes of variability, thermodynamic processes, land-atmosphere feedbacks and antecedent conditions (Ngaina and Mutai, 2013; IPCC, 2013). Notably, numerous challenges exist in assessing changes in climate extremes not only due to intrinsically rare nature of these events, but because they invariably happen in conjunction with disruptive conditions especially in key sectors such as agriculture in many developing countries whose vulnerability to climate change has been exacerbated by its weak adaptive capacity (IPCC, 2007,

2013).

In Kenya, agricultural sector contributed 36.6% of Gross Domestic Product (GDP) in the period of 1964-1974, 33.2% in 1974-1979, 29.8% in 1980-1989, 26.5% in 1990-1995 and 24.5% in 1996-2000 (FAO, 2005). FAO's (2005) report indicate that livestock sector accounted for 90% of employment and more than 95% of family incomes in Arid and Semi Arid Lands (ASALs). Vulnerabilities of communities to impacts of climate

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