IMPACT OF RANGE CONDITION ON RESILIENCE AND PRODUCTIVITY OF HERBACEOUS FORAGE SPECIES IN KIVAA AND NTUGI WATERSHEDS IN EASTERN KENYA

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Abstract

This study was conceived upon the realization that despite their wide geographical coverage and great economic potential, rangelends have not been contributing adequately to local communities' economic development, realization of national development as well as achievement of the Millennium Development Goals (MDGs). Past studies have revealed that rangelands are some of the most widely spread and dominant (on a land-area basis) renewable resources in the poorest agro-ecological zones of the world. Grazing in these areas has been the most efficient process to convert cheap primary production to valuable animal products which can contribute towards economic development of these areas. These rangeland dwellers are generally poor and have been persistently overlooked by planners and policy-makers. Over the last century, rangelands have been progressively stressed by overuse, infringement of cultivation, unfavourable policies, urbanization and infrastructure development. A recent study conducted by the United Nations Environment Programme (UNEP) singled out human impact and, specifically, livestock grazing as the main cause of the irreversible degradation which has prevailed during the past two decades in most of the world's rangeland areas. In Kenya, the Sessional Paper No. 10 of 1965 stated that the Government was going to prioritize development in the so-called high potential areas because of their perceived great potential to promote national economic development. This set stage for the neglect of the so-called low potential areas where the rangelands fall. This trend is being reversed by enactment and promulgation of a new Constitution in Kenya in the year 2010 in which Cap 5 Article 69 states that; *land in Kenya shall be held, used and managed in a manner that is equitable, efficient, productive and sustainable.* This Constitution provides for devolution of power and resources to the grassroots and hence promotes equitable development in all areas of Kenya including the rangeland areas. This study will entail investigating resilience and biomass production of key forage species as influenced by range condition dynamics. It will seek to address the problem of exploiting grazing resources at levels not consistent with the forage species' regenerative capacity leading to their depletion. The study will be conducted in two forested hills serving as watersheds in Eastern Kenya namely; Kivaa Hill in Masinga District of Machakos County and Ntugi Hill in Tharaka South District of Tharaka-Nithi County. Some key forage species will be identified through interviewing the local agro-pastoralists and local livestock department officers. The identified forage species will serve as diagnostic species, and together with soil data, they will act as indicators of conservation status and range condition trends. Influence of climatic and edaphic factors on the resilience and productivity of the key forage species and hence the productive capacity of the range sites will be examined. Ocular observations, satellite images and laboratory analysis of soil and forage samples will be undertaken. Randomized block design will be used in selection of samples. Belt transects each replicated thrice will be established in the selected blocks and sampling plots of 5m by 5m will be established along these transects. The data collected will be analyzed using inferential and descriptive statistics including regression and correlation analysis to determine influence of various parameters on others. The findings of this study will be useful to herders, range operators and ecologists since it will guide in determining carrying capacity and hydrologic potential of rangelands and watersheds and will be useful in developing effective strategies for their sustainable management.