ADOPTION OF CLIMATE-SMART TECHNOLOGIES AND THEIR EFFECT ON INCOME AMONG AGRO-PASTORALISTS IN MARSABIT COUNTY, KENYA

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DECLARATION

This thesis is my original work and has not been presented in any other university for any award.

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We confirm that the work reported in this thesis was carried out by the student under our supervision.

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ABSTRACT

The world is facing variable weather events and gradual climatic change and Kenya's arid lands where pastoralism is a viable livelihood option are not exceptional. Marsabit County, inhabited by diverse pastoral and agro-pastoral groups, faces extreme climatic events that affect local livelihoods. Despite the government and development organizations disseminating climate smart technologies and practices, the communities still rely on emergency food aid which is unsustainable. Given climate-induced uncertainties, climate-smart technologies may offer viable adaptation options for agro-pastoralism based economies that enhances resilience, increases productivity and reduces greenhouse gases. This study was conceptualized in line with the action theory of adaptation to climate change leading to four objectives; analyze temperature and rainfall trends in Saku Sub-County (1980-2020), identify livestock-crop smart technologies adapted, analyze determinants of climate-smart technologies adoption and assess the impact of adoption of smart technologies on household income. The research design was a survey with a sample size of 373 households in Karare, Marsabit Central (Dakabaricha) and Sagante/Jaldesa wards. Stratified sampling was used in selecting the study sites while systematic random sampling was applied in selecting the households of the agro-pastoralists. The data was collected using questionnaires installed in Kobocollect that were administered through face-to-face interviews with agro-pastoralists, interview schedules administered to 10 key informants and focus group discussions held with 6 groups. Climate data on temperature and rainfall trends were analyzed with Mann Kendall and Sen's slopes, descriptive statistics were generated for the socio-demographic characteristics of the sampled households while determinants were assessed through multivariate probit regression and propensity matching score on the impact of climate smart technologies adoption on income. Decreasing rainfall and increasing maximum temperature trends were significantly in August and September while the minimum temperature trend was significantly increasing in all the months. Agro-pastoralists practiced crop and livestock climate smart technologies and the most adopted categories were improved and traditional crop varieties and soil fertility management (92%), followed by water and water use management (85%) while the least used was livestock management (15%). Agro-pastoralists age, household size, gender, education status, marital status, average income per month, access to credit, training, extension services and weather information influenced the adoption, with agro-pastoralists who adopted multiple climate smart technologies showing significantly higher income. The study recommends that agro-pastoralists should have timely access to weather information in order to make important decisions for adoption of climate smart technologies. Governments, research institutions and non-governmental institutions should closely work together in training and providing extension services to agro-pastoralists on livestock and crop husbandry best practices. The governments and development partners to consider socioeconomic and institutional factors when disseminating multiple crop-livestock climate-smart technologies and practices for enhanced income and more resilient communities.