

The aim of this study was to assess the economics of climate change adaptation in smallholder rice production systems. The study covered three smallholder rice production systems including irrigation, rainwater harvesting system and upland rainfed rice systems in Mvomero and Morogoro rural Districts. The specific objectives were: (i) To assess the perceptions of farmers on climate change impacts in different rice production systems, (ii) To analyse the determinants of rice productivity and profitability on land; (iii) To estimate the impact of climate change on net revenue from rice enterprise under different emission scenarios and iv) To estimate the costs and benefits of adaptations strategies in different rice production systems. The data for this study were collected using a structured household questionnaire that was administered to a random sample of 150 households composed of equal sub-samples from the three rice production systems. Descriptive and quantitative methods were used to analyze the data. Likert scale, an average production function based on Ordinary Least Square (OLS) estimation approach, Regression-based prediction and cost-benefits analysis were used in data analysis.

Results indicated that smallholder farmers were aware of the impact of climate change by contributing to crop infestation and diseases, higher food costs and low yields. Irrigation was identified as the most preferable adaptation having higher net present value of Tshs 12 491 951/ha followed by rainwater harvesting Tshs 2 665 769 /ha and rainfed Tshs 1 199 253/ha. The cost-benefit ratios were 1.22; 1.14 and 1.16 in irrigated, rainfed and rain water harvesting systems, respectively. Therefore, the government and other private institutions should invest more in irrigation as it tends to boost up production during drought period or when there is low rainfall.

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