



Introduction

Climate change impacts are expected to be higher for coffee, a crop that is grown mostly by smallholder farmers. Adaptation is the only option to reduce the impacts. Therefore, this study aimed at producing climate change projections for the slopes of Mt. Kilimanjaro and determines its effect on future coffee production.

Materials/Methods

The study was conducted on the slopes of Mt. Kilimanjaro in Tanzania with altitude range between 1000-1700 m.a.s.l. The study utilized climatic data from CORDEX-Africa to project climate change in the near-term period (2026-2055) with Representative Concentration Pathway (RCP) 4.5. The CMhyd tool was used to bias-correct the extracted data (Rathjens *et al.*, 2016). The projections were qualitatively interpreted on basis of the known climatic requirements for Arabica coffee.

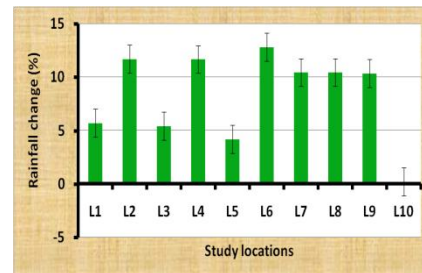


Figure 1: Relative change in rainfall

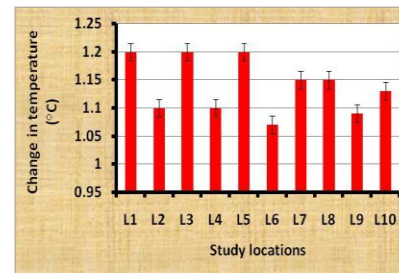


Figure 3: Absolute change in maximum temperature

Results/Discussion

Yearly historical rainfall ranged between 500-3000 mm. However,

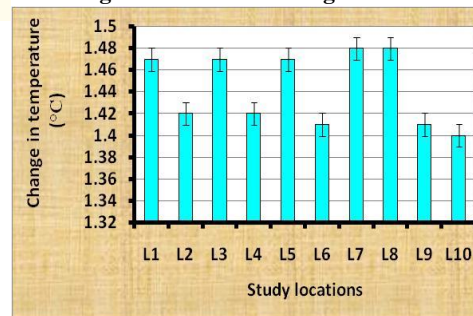


Figure 2: Absolute change in minimum Temperature

projections (2026-2055) indicate an increase in rainfall up to 13 % (Fig. 1). In addition, during the baseline period the highest minimum temperature (T_{min}) and maximum temperature (T_{max}) were 19 °C and 29 °C respectively. Results revealed an increase in T_{min} and T_{max} during the Near-term period which varies between 1.4 – 1.48 °C (Fig. 2) and 1.06-1.2 °C (Fig. 3) respectively. High temperatures cause fruit abortions, reduced berry growth, and accelerate ripening, leading to reduction in coffee yield and quality. Moreover, T_{min} increase the rate of respiration so the assimilates which could be used for growth and yield are reduced.

Conclusion/Perspectives: The impacts of climate change on future coffee yields will be considerably big in comparison with the baseline yields on the slopes of Mt. Kilimanjaro. These projected impacts are mainly attributed to increase in T_{min} and T_{max} and this call for urgent preparations of adaptation strategies such as planting shade trees and development of drought tolerant varieties.