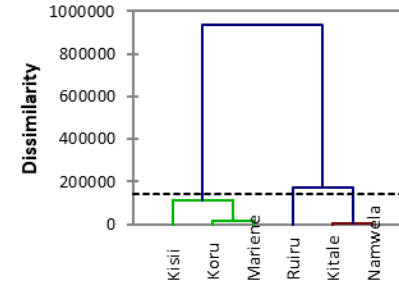




Results/Discussion

The analysis revealed optimum amount of rainfall, >1400mm in all locations, apart from Ruiru, with 1087.7 mm.

Figure 3: Cluster analysis



There was a long-term increase in temperature of 0.88, 1.71, 1.1, and 0.33°C in Ruiru, Mariene, Kisii, and Namwela, and a decline of 0.43 and 0.83°C in Kitale and Koru respectively (Fig 1). The increased temperature is likely to reduce growth, flowering, and fruiting, and increase the pressure of pests. The PC 1 and 2 explained 77.2% of the total variations (Fig 2) while the dendrogram separated the location into three main clusters: Kisii, Koru, Mariene in cluster 1, Ruiru cluster 2, Kitale and Namwela in 3 (Fig 3).

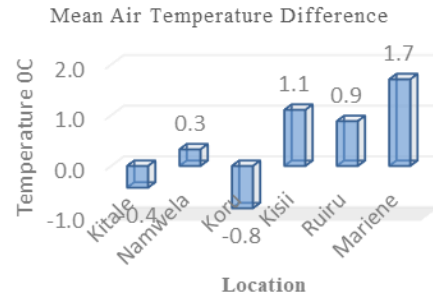


Figure 1: Changes in average air temperature

Observations (axes F1 and F2: 76.14%)

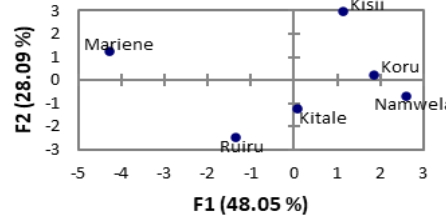


Figure 2: The PC analysis for rainfall and air temperature

Introduction

Coffee is a climate-sensitive crop. It is threatened by among others changes in temperature, amount, and distribution of rainfall. Substantial deviations, from norms, amounts to climate change, expected to reduce land suitable for coffee by up to 50% Globally, mostly due to rising temperatures. The current study evaluated the extent of variation in rainfall and temperature within the coffee production regions in Kenya, to predict their influence on suitability of the respective areas to coffee production.

Materials/Methods

This study profiled changes in amount and distribution of rainfall, and air temperature in six locations in different Counties (in brackets); Ruiru (Kiambu), Mariene (Meru), Kitale (Trans Nzoia), Namwela (Bungoma), Koru (Kericho) and Kisii (Kisii) for 11 years and mean compared to long term changes spanning over 60 years. Mean changes per study condition were subjected to Principal Component Analysis (PC) using XLSTAT software.

Conclusion/Perspectives

The analysis revealed substantial evidence of climate change in Mariene and Ruiru regions while the lowest variations in the study conditions were in Namwela and Kitale. Therefore, the current trend in the country on the promotion of coffee expansion in the region around these locations is strategic and sustainable

References:

Richardson D, Kath J, Byrareddy VM, Monselesan DP, Risbey JS, Squire DT, et al. (2023) Synchronous climate hazards pose an increasing challenge to global coffee production. PLOS Clim 2(3): e0000134. <https://doi.org/10.1371/journal.pclm.0000134>