

# **IMPACT OF CLIMATE CHANGE ON IRRIGATION WATER REQUIREMENTS OF MAJOR CROPS AT GOBU SEYO DISTRICT, EAST WELLEGA ZONE, ETHIOPIA**

**\*Habtamu Bedane<sup>1</sup>, Teshome Seyoum<sup>2</sup>**

<sup>1</sup>Oromia Agricultural Research Institute, Bako Agricultural Engineering Research Center, Bako

<sup>2</sup>School of Water Resources and Environmental Engineering, Haramaya University, Ethiopia

\*Corresponding author e-mail: [habtamubedane503@gmail.com](mailto:habtamubedane503@gmail.com)

---

## **ABSTRACT**

The study was carried out to investigate the likely impacts of climate change on irrigation water requirements of selected crops. CROPWAT 8.0 model was used to simulate the total crop water requirement as well as irrigation requirements for the present and the future decades. In addition to the base period (1990-2019), future scenarios (2023-2052) and (2053-2082) projections were made based on the output ensemble of 17 GCMs with aid of a MarkSim-GCM for two emission scenarios, the medium (RCP4.5) and the high (RCP8.5). The analysis demonstrates that the crop water needs of both crops changed from 4.55% to 7.89% under both scenarios (RCP8.5 and RCP4.5) and time horizons (2023-2052 and 2053-2082). The highest change of crop water requirements was recorded at high emission scenario (RCP8.5) and mid-term period and the lowest was detected at medium emission scenario (RCP4.5) with near-term period. The change in irrigation water requirements of the research area's selected crops ranged from -1% to 8.15%. The greatest increasing change was detected in the RCP8.5 with mid-term period, whereas the smallest change was recorded under RCP4.5 with near-term period. The finding clearly suggests that, the future climatic changes will have a major impact on crop water and irrigation water requirements of the selected crops in the study area. As a result, it is suggested that farmers, water managers, water user associations, and decision-makers work together to improve the current low level of water use efficiency by enhancing water storage, distribution, and use for crop production in the future.

**Keywords:** Climate change; emission scenarios; irrigation water requirements; Future irrigation demand; Gobu Seyo district