World Academy of Science, Engineering and Technology
International Journal of Environmental and Ecological Engineering
Vol:10, No:01, 2016

Recent Climate Variability and Crop Production in the Central Highlands of Ethiopia

Authors : Arragaw Alemayehu, Woldeamlak Bewket

Abstract : The aim of this study was to understand the influence of current climate variability on crop production in the central highlands of Ethiopia. We used monthly rainfall and temperature data from 132 points each representing a pixel of 10×10 km. The data are reconstructions based on station records and meteorological satellite observations. Production data of the five major crops in the area were collected from the Central Statistical Agency for the period 2004-2013 and for the main cropping season, locally known as Meher. The production data are at the Enumeration Area (EA) level and hence the best available dataset on crop production. The results show statistically significant decreasing trends in March–May (Belg) rainfall in the area. However, June – September (Kiremt) rainfall showed increasing trends in Efratana Gidim and Menz Gera Meder which the latter is statistically significant. Annual rainfall also showed positive trends in the area except Basona Werana where significant negative trends were observed. On the other hand, maximum and minimum temperatures showed warming trends in the study area. Correlation results have shown that crop production and area of cultivation have positive correlation with rainfall, and negative with temperature. When the trends in crop production are investigated, most crops showed negative trends and below average production was observed. Regression results have shown that rainfall was the most important determinant of crop production in the area. It is concluded that current climate variability has a significant influence on crop production in the area and any unfavorable change in the local climate in the future will have serious implications for household level food security. Efforts to adapt to the ongoing climate change should begin from tackling the current climate variability and take a climate risk management approach.

Keywords : central highlands, climate variability, crop production, Ethiopia, regression, trend
Conference Title : ICECC 2016 : International Conference on Environment and Climate Change
Conference Location : Zurich, Switzerland
Conference Dates : January 12-13, 2016