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AUTOREGRESSIVE DISTRIBUTED LAG MODELING OF CLIMATIC FACTORS INFLUENCING SUPPLY RESPONSE OF WHEAT IN ETHIOPIA

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ABSTRACT

Climate change is among the major constraints to cereal crop productivity in Ethiopia. This study analysed the wheat supply response to climate and non-climatic variables in Ethiopia. The study employed Autoregressive Distributed Lag (ARDL) model using annual data from 1981 to 2018. The results revealed that all climatic variables have positive impact on wheat output in both the long-run and short-run. However, only the elasticity coefficients of CO₂ are statistically significant in both long- and short-terms. The estimated elasticity for CO₂ in zero order difference (current year) has positive and significant effect on wheat production. The estimated elasticity coefficients of all the non-climatic variables such as price of wheat, area under wheat, and fertilizer consumed are all positive and have significant impact on wheat output supply in the long-run. The result implies that wheat output is highly responsive to its own price, area under wheat, and fertilizer quantity used on wheat production in the long-run. On the other hand, the study result indicated that the elasticities of log wheat area in zero order, log price of wheat in first lag order, and log fertilizer quantity used in zero order have positive and highly significant effect on wheat production. This implies that wheat output is highly responsive to previous year's price, land currently under wheat production and fertilizer consumed in current year.

Keywords: Climate Change, Output Supply Response, Wheat Crop, ARDL Model, Ethiopia.