

Project Summary

Title	Improving water use efficiency in barley using water management technologies for enhancing adaptation to climate variability and climate change in the northern Ethiopia
PI	Dr. Arayie Alemie Berhe Faculty of Agriculture, Mekelle University Email: arayaalemie@gmail.com
Purpose	The main objective of the study is to reduce vulnerability to climate change through rainwater management in barley and to optimize water use and evaluate the performance of barley under climate change scenarios by making use of a validated yield predicting model.
Project Summary	<p>Drought events have been causing food crises in Ethiopia since early 70s. Since then many agricultural sectors, particularly the smallholder farmers, faced many challenges; specially the lack of secure rainwater. The natural climate variability is aggravated by manmade climate change. The food shortages are exacerbated by the increase in population. The main limitation in stabilizing food security in the county is the dependency of the farming system on erratic rainfall. Rainfall fluctuations play a significant role in determining the national economy of Ethiopia because many economic activities in this country depend heavily on rain-fed agriculture. Consequently, one of the main obstacles to developing sustainable agriculture in Ethiopia is seasonal crop water shortage. As a result of its dependence on erratic rainfall for food production, Ethiopia is very vulnerable to soil water deficit. Given that barley is the staple food crop, its production is critical for the national food security. Thus, increasing the efficiency of rain water use would improve the country's food security. This project seeks to; (i) analyse rainfall and soil moisture variability of barley production under different planting time with smallholder farming community; (ii) quantifying barley crop coefficients, transpiration and yield response factors; and (iii) optimize technical water management options to improve soil water availability for adapting climate change. It is anticipated that this project will lead to quantification of yield response of barley to water and barley crop coefficient. This will help to minimise unwise use of water which ultimately lead to minimize water shortage risk resulted from climate change in the region in general. The coefficient is a basic input for models which can be used to explore and evaluate alternative options under various climate change scenarios in order to improve water productivity and achieve higher water use efficiency. Apart from improving water use efficiency, it can be applied in yield prediction activities under alternative scenarios by extension specialists, relief organizations and policy makers. It will also lead to selection of best technique and development of guidelines for adoption and promotion of soil water conservation techniques that will be used for adoption in view of climate change. Strategies of supplemental irrigation will be estimated as a function of water applied. In addition, estimate success or failure rates for each sowing criteria from field experiment and long year climate data and identified proper time of planting will be established. The project will also provide a validated AquaCrop model that can be used to optimize water management under different planting time including scenario analysis with barley under different locations and seasons. Various interest groups will use AquaCrop model for predicting yield.</p>

Country and Specific Location(s)	Ethiopia
Start Date	October, 2009
End date	October, 2011
Amount of Funding	USD 28,060

