

# Climate-smart agricultural practices increase maize yield in Malawi

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Festus Amadu, post-doctoral research associate in the Department of Agricultural and Consumer Economics at the University of Illinois, conducted research on the efficacy of international aid programs supporting climate-smart agricultural practices in Malawi. Credit: College of ACES, University of Illinois.

Climate change creates extreme weather patterns that are especially challenging for people in developing countries and can severely impact agricultural yield and food security. International aid organizations have invested billions of dollars in promoting climate-smart agriculture (CSA) practices, but the effects of those programs are rarely documented.

A new University of Illinois study helps provide such documentation. Researchers Festus Amadu, Paul McNamara, and Daniel Miller, Departments of Agricultural and Consumer Economics and Natural Resources and Environmental Sciences at U of I, evaluated the effectiveness of a major United States Agency for International Development (USAID) program in southern Malawi. They found impressive results; farmers who implemented CSA practices saw a 53% increase in maize yields.

Those findings, published in the journal *Food Policy*, document the efficacy-as well as the long-term impact-of CSA programs that provide training and resources to farmers, says Amadu, post-doctoral research associate at U of I and lead author on the study.

"Our research showed that farmers were able to maintain these practices. Their perceived benefits outweighed constraints, to the extent that when we conducted the study two years after the USAID project had ended, retention rates were high," he states.

The USAID contributed \$86 million to the Wellness and Agriculture for Life's Advancement (WALA) project in southern Malawi from 2009 to 2014. The project featured multiple components, including maternal and child health nutrition education; community development activities; and training farmers in CSA practices to improve watershed restoration.

Amadu's research focuses on the WALA project's CSA component, which aimed to improve [food security](#) by helping farmers increase their

adoption of environmental conservation practices and realize higher yields of maize, the main crop in Malawi.

The researchers surveyed more than 800 smallholder [farmer](#) households in southern Malawi. They also visited fields to verify whether farmers maintained the CSA practices over time. The study included farmers in WALA watersheds as well as farmers in comparable watersheds without WALA CSA activities.

"Climate change leads to excessive weather shocks with extreme dryness or extreme rain," Amadu explains. "Farmers can use climate-smart practices to absorb excess rainwater and conserve it so it is available in times of drought."

CSA practices include technologies such as absorption trenches that capture rainwater during excess rainfall and gradually let it seep it into the soil or save it for irrigation during dry periods.

"A group of farmers could have large absorption trenches around their farms. The farms could also have continuous contour trenches and stone bounds, which would slow excessive rain water in mountainous or hilly areas and help conserve soil nutrients," Amadu explains.

Other CSA practices include using vetiver grass (a legume plant that helps soil conservation), or agroforestry fertilizer trees, where tree roots can reduce rain water run-off, and falling leaves can serve as fertilizer.

"These are not really rocket science technologies. They are just basic things that people have always done but they never really prioritized them," Amadu says. He points out such techniques require investment of land, labor, and finances that make adoption challenging in developing countries.

Amadu trained a team of 14 students from Malawi's main agricultural university to conduct the surveys, using computer-assisted personal interviewing (CAPI) technology. The students interviewed smallholder farmers and their spouses in the project area, as well as a control group that did not learn about CSA interventions.

The researchers identified several factors that increased CSA adoption rate, such as the ability to hire help, and access to extension services. They also found that plot size, soil fertility, and use of fertilizer had a positive effect on yield.

Amadu says the results indicate aid programs work because they help farmers acquire knowledge and gain access to resources, while reducing barriers to implementing the CSA techniques.

The researchers note the findings also have policy implications beyond the results of the WALA project.

"More generally, our findings on CSA adoption and maize yields suggest that aid-financed CSA can be effective in reducing food insecurity in contexts beyond Malawi, particularly those in resource-poor, rural dryland areas where rainfed agriculture predominates," they conclude in the paper.

**More information:** Festus O. Amadu et al, Yield effects of climate-smart agriculture aid investment in southern Malawi, *Food Policy* (2020). [DOI: 10.1016/j.foodpol.2020.101869](https://doi.org/10.1016/j.foodpol.2020.101869)

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