



Impact of Irrigation on Farm Households Quality of Diet: Evidence from Ethiopia

*Musa Hasen Ahmed*¹

January 2021 / No.TR005

The context

Having better nutritional status by itself is a valuable development indicator, and conjointly it is also a vital contributor to economic development. This being the case, the number of undernourished people remains high in the world and appears to be escalating in Africa, where about 21% of the population is under-nourished. For instance, in Ethiopia, 38% of children under the age of five are stunted and 28% of child deaths in the country are associated with under-nutrition. In fact, the Global Nutrition Report (2018) also rated Ethiopian

1 UNU-MERIT, Maastricht University, the Netherlands, Email: ahmed@merit.unu.edu

performance based on the global nutrition targets as ‘no progress or worsening’ for 6 targets out of the 9 targets and the country showed ‘some progress’ only for one target. Therefore, significant work is needed to eliminate hunger, achieve food security, and boost nutritional status, which are part of the Sustainable Development Goals (SDGs). Since the vast majority of poor and under-nourished people rely on small-scale farming to support their livelihoods, investigating the overall performance of the agricultural sector from the perspective of supporting nutrition status is a crucial pathway to inform nutrition-sensitive agriculture strategies.

However, climate change is posing an unprecedented challenge to the sector by altering the amount and distribution of rainfall within and between rainfall seasons in the region. It is argued that improving the adaptive capacity of farmers is urgently needed to withstand the worst of the future climate impacts in Sub-Saharan Africa (SSA). Particularly, as the level and frequency of climate variability are exceeding the capacity of farmers in the region to adopt through their skills and knowledge alone, it is crucial to underscore the need for policy support. In this regard, developing the agricultural sector through irrigation infrastructure is a useful strategy to delink the region's economy from rainfall and to curb climate change-induced setbacks.

The problem

Ethiopia is among the countries in the region where rain-fed agriculture predominated by smallholder farmers dominates the economy. In addition, weather variability that results in major crop failures and welfare losses has been recurring in the country. In Ethiopia, 28% of child deaths are associated with under-nutrition, and the prevalence of under-five stunting and wasting are higher than even the developing country averages. Therefore, how to make the agricultural sector more nutrition-sensitive and climate-smart is a key policy and research question.

The Government of Ethiopia has prioritized investing in irrigation infrastructure. As of 2015, the area of land covered by irrigation had exceeded 2.34 million hectares, and the Government has planned to increase this coverage to 4.14 million hectares by the end of 2020.

This policy brief provides information on the impact of irrigation on the quality of diet using nationally representative data from Ethiopia— one of the countries where chronic food insecurity, malnutrition, and the prevalence of micro- and macronutrient deficiencies is still widespread and continues to be a major public health problem in the country.

Studying the effects of irrigation schemes on rural households well-being, such as nutritional status, may contribute to charting sound policies for future irrigation development, programme design, and to justify whether irrigation can be considered as a viable instrument to enhance nutrition security for Ethiopia and beyond.

Key findings

The research on which this policy brief is based uses the comprehensive and nationally representative Ethiopian Socio-economic Survey, which was administered by the Living Standards Measurement Study-Integrated Surveys of the World Bank in 2013/2014. Household Diet Diversity Scores (DDS) are used as indicators of nutrition status. It is believed that increasing the variety of foods across and within food groups ensures adequate intake of essential nutrients and promotes good health. Dietary diversity is measured by summing the number of foods or food groups consumed over a reference period, and this period usually ranges from 1 to 7 days. Endogenous switching regression model that enables us to estimate the effects of irrigation by controlling both observable and unobservable heterogeneities is used to address the objective of the study. Besides, propensity score matching is used to analyze the relationship between access to irrigation and possible mechanisms through which access to irrigation affects the quality of diet. This includes farmers' land allocation decisions and spending on nutritious food items.

Access to irrigation improves the quality of diet

The result indicates that access to irrigation improves the nutritional status of farm households. Specifically, it shows that access to irrigation improves diet diversity score (DDS) by 2.14 for users, whereas DDS for non-users would have been increased by 0.34 if they had utilized irrigation technologies.

Access to irrigation encourages the production of nutritious crops but not spending on food

After estimating the effects of access to irrigation on the quality of diet, the study also examined if access to irrigation can influence farmers spending on food and the decision to produce nutritionally rich crops. Accordingly, the result shows that access to irrigation increases the probabilities of cultivating non-cereals in general, and fruits and vegetables significantly compared with their non-users' counterparts. However, the association between access to irrigation and spending on food, either on total food expenditure or spending on nutritious food items is weak. Specifically, the result indicates that access to irrigation increases the probabilities of producing fruits and vegetables by about 26% and 8%, respectively, compared with their non-users' counterparts. The results suggest that the main pathway through which access to irrigation affects the quality of diet is through its effect on accessibility of nutritious food items from own production.

Implications for policy makers

The results show that access to irrigation significantly and positively affects diet diversity. This implies that irrigation is a viable instrument to enhance the quality of diet and nutritional status of smallholders. Furthermore, the study on which this policy brief is based also shows that access to irrigation encourages farmers to produce nutritionally rich crops such as vegetables and fruits. This is an interesting result for countries such as Ethiopia where malnutrition and micronutrient deficiencies are a major public health problem. Therefore, as most of the poor and malnourished segments of the population is relying on agriculture, developing the sector by investing in irrigation infrastructure can contribute to reducing those problems significantly. Efforts should be made to tackle constraints that are impeding the adoption of irrigation technologies.

There is also need for further research to know more about the impact of irrigation on the quality of diet and nutritional security. In particular, additional research is needed to explore the effects of irrigation on the production and consumption of micro-(and macro) nutrients such as zinc, iron, protein, and vitamins as deficiencies of these nutrients are among the major public health problem in most developing countries. Besides, the shift in farmers' decisions into the production of nutritionally rich food varieties can have implications on the type and amount of food produced and supplied to the local market. This, in turn, could affect the availability and affordability of nutritious food items for all, including for landless labourers and urban dwellers. Therefore, exploring the spill-over effects of access to irrigation on the quality of diet at the market level could be of interest in the literature.



Mission

To strengthen local capacity for conducting independent, rigorous inquiry into the problems facing the management of economies in sub-Saharan Africa.

The mission rests on two basic premises: that development is more likely to occur where there is sustained sound management of the economy, and that such management is more likely to happen where there is an active, well-informed group of locally based professional economists to conduct policy-relevant research.

www.aercafrica.org

Learn More



www.facebook.com/aercafrica



www.instagram.com/aercafrica_official/



twitter.com/aercafrica



www.linkedin.com/school/aercafrica/

Contact Us

African Economic Research Consortium
Consortium pour la Recherche Economique en Afrique
Middle East Bank Towers,
3rd Floor, Jakaya Kikwete Road
Nairobi 00200, Kenya
Tel: +254 (0) 20 273 4150
communications@ercafrica.org