

Essays on development economics

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IMPACT PARAGRAPH

The impact paragraph of this doctoral dissertation is added in compliance with article 22.5 of the "Regulations for obtaining the doctoral degree at Maastricht University" decreed by resolution of the board of deans, dated 1 October 2020.

This study investigated the effects of environmental and developmental changes on decisions relating to agricultural production, diet quality, and the development of human capital. The findings of each chapter in this dissertation have a considerable impact on designing and implementing programs that aim to improve human capital and combat the adverse effects of climate change.

The findings on how early planting season weather variation affects smallholder farmers' land allocation decisions help us understand how climate change affects agricultural output and the efficiency of adaptation investments. The result also helps policymakers fully comprehend the effects of climate change and develop an efficient policy response because disregarding such adaptation margins could result in skewed calculations. Hence, the findings help to attain SDGs Goal 13, which calls for increased resilience and adaptability to climate-related shocks among other things. The expansion of maize, including into less suitable areas at the expense of other crops, may affect agricultural production, crop rotation, commercialization, and diet. Therefore, the result informs and encourages decision-makers about the importance of the development and distribution of seeds for high-value crops that are drought-resistant.

The finding on the role of irrigation to improve the diet quality of smallholder farmers gives donors and decision-makers working to improve nutritional status the assurance to address challenges preventing the expansion of irrigation systems in smallholder-dominated agriculture. Hence, the result will be crucial for future policies and programs that aim to improve the health status of farming households, especially in Africa where there are more agricultural households, less irrigation use, and more people facing food and nutrition insecurity. This will significantly contribute to attaining SDG 2 which aims to promote sustainable agriculture while eradicating all forms of undernourishment, achieving food security, and enhancing nutrition. The impact pathway findings, which demonstrate how irrigation affects nutrition, also serve as a point of departure for all those working to improve the nutritional status in nations like Ethiopia, where under-nutrition and deficiencies in essential micronutrients and vitamins are serious public health issues. Farmers' decisions to grow nutrient-rich food types as a result of access to irrigation may increase the accessibility and affordability of nutrient-rich foods for non-farming households in the village. This

provides policymakers with recommendations on how to improve food quality at the community level in addition to the advantages for households.

Our finding on how a government program intended to increase coverage of higher education unintentionally improved educational outcomes for young females at lower educational levels also aids policymakers in improving their estimation of the effectiveness of public investment and helps to justify public spending on higher education. Besides, the documented spillover effect that helps to improve female educational attainment helps in achieving SDG4 which aims to eliminate gender gaps in education and ensure equitable access to all levels of education.

These results from analyzing the trade-off between children's education and road access also provided suggestive information for policymakers regarding factors keeping children out of school. It reveals that domestic child labor and a lack of interest are the top reasons why children skip school. This makes it easier for policymakers and other stakeholders to establish systems for addressing these problems. This might include, improving access to water and animal feeds, and establishing a flexible school system that takes into account peak labor demand seasons.

We have been attempting to reach out to possible beneficiaries of the results of this dissertation using several channels. Chapter 2 is presented at the 31st International Conference of Agricultural Economists and the 96th Annual Conference of the Agricultural Economics Society. The third chapter is presented during the 2020 and 2021 biannual conferences of the African Economic Research Consortium (AERC). Besides, a policy brief is prepared and distributed at the annual senior policy forums organized by AERC. The forums bring together, among others, intellectual leaders, private sector actors, ministers, heads of civil service, and government agencies from Africa to exchange experiences. The fourth chapter is presented at the 2023 CSAE conference in Oxford, while the fifth chapter was presented at the UNU-MERIT internal conference. Chapter 2 has already been published in the *Journal of Agricultural Economics*, and the third chapter made its final distinction in the *Journal of Irrigation and Drainage*.