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Local food security impacts of biofuel crop production in southern Africa

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Abstract

Biofuels have been promoted as a renewable energy option in many countries, but have also faced extensive scrutiny over their sustainability. Food security is perhaps the most debated sustainability impact of biofuels, especially in regions such as Sub-Saharan Africa that experience high rates of malnutrition and have been a major destination for biofuel-related investments. This study assesses the local food security impacts of engagement in biofuel crop production using a consistent protocol between multiple crops and sites. We use standardized metrics of food security related to dietary diversity and perceptions of hunger, and focus on feedstock smallholders and plantation workers in four operational projects: a large-scale jatropha plantation (Mozambique), a smallholder-based jatropha project (Malawi) and two hybrid sugarcane projects (Malawi, Eswatini). Collectively these reflect the main feedstocks, modes of production and land use transitions related to biofuel projects in Sub-Sahara Africa. Inverse Probability Weighting analysis indicates that involvement in sugarcane production improved household food security for plantation workers and feedstock smallholders. Conversely, involvement in jatropha production does not have a statistically significant positive effect on household food security for both workers and smallholders. Regression models indicate that the factors driving food security indicator levels vary between study sites. Wealth indicators influence food security indicators in several sites, but the absolute level of income plays a smaller role, while income stability/regularity, access to credit and stable markets for selling sugarcane be important drivers as indicated by the strong effect of proxy variables on indicators.