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Large scale land investments and food security in agro-pastoral areas of Ethiopia

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Abstract

There is an ongoing debate about the impact of large scale land investments on the livelihoods of rural households in developing countries. This study investigates the impact of large scale land investments on households' food security in Ethiopia. The findings show proximity to large scale land investments is associated with higher food intake with an average treatment effect of 744.71 kcal per day per adult. This is mainly because of the availability relatively good natural capitals near to large scale land investments. Large scale land investments should make sure that the local community has access to grazing to improve food security of the local communities.

Key words: Food security, large scale land investment, sugar plantations, livelihoods, pastoralism, propensity score matching

1. Introduction

Pastoralism and agro-pastoralism are predominant production systems in the arid and semi-arid drylands of Africa. About 25 million pastoralists and 200 million agro-pastoralists live in Sub-Saharan Africa (SNV, 2012). Pastoralists mainly depend on livestock production, while agro-pastoralists depend on livestock and crop production for their livelihoods. Ethiopia has one of the largest (agro-)pastoralist areas in East Africa, covering 61% of its drylands. Livestock contributes to the livelihoods of 60% - 70% of the Ethiopian population (Halderman, 2004). The country also has the largest livestock population on the African continent (FDRE, 2014). Despite this considerable livestock resource, Ethiopia is one of the most food-insecure countries in the world.

The Growth and Transformation Plan of Ethiopia aspires to make the country a lower middle-income country by 2025. It considers large scale land investments (LSLIs) to be a vital tool for developing the pastoral areas (Keeley, 2014). With these investments, lands with good pasture, water, and wildlife were taken to state-owned and private farms. The impact of LSLI on household food security in Ethiopia is, however, not yet fully understood. Therefore this paper provides an insight into the impact of proximity to LSLI on pastoral household food security, one of the most debated issues.

2. Data and sampling

We used data from the Living Standard Measurement Survey (LSMS) for Ethiopia for the years 2011/12, 2013/14, and 2015/16. The LSMS is a Rural Socio-Economic Survey from a collaborative project between the Central Statistical Agency of Ethiopia and the World Bank (CSA, 2017). We include 12 zones of major agropastoral regions in our study: Jigjiga, Liben, and Shinile, Afar zone 1 and zone 3, Borana, Guji, Karrayu, Bale, and Hararghe, south Omo and Nuer zones. A total of 2,106 households are included in this analysis.

3. Estimation strategy

Experimental and non experimental designs are widely used designs for impact assessments. However, the respondents in the large scale land investment are not randomly assigned. Therefore, a Propensity Score Matching (PSM) is used to avoid endogeneity (Bishop, 2015; Shete and Rutten, 2015). We classify households as being ‘treated,=1’ if they are located (up to 150 km), 0 otherwise. In addition a random effects model was estimated by including control variables. The dependent variable is food security measured by using three indicators, food intake, self -report, and coping strategies index (CSI). In food intake, we use 1 for households that consumed at least 2,200 kcal/day/adult, 0 otherwise; in self-report 1 for households who reported being food secure, 0 otherwise; and in CSI, 1 for households with zero CSI, and 0 otherwise. Several control variables such as natural assets include the size of land owned, percentage of a forest, soil quality, and access to irrigation; human capital variables include age, gender, and education of the household head and household size; physical capital variables such as livestock and distance to road and markets; financial assets such as credit use and household income; social services such as access to extension, environmental shocks such

as drought exposure, and livelihood strategy (if the household is a pure pastoralist or diversifying).

4. Results

4.1. Propensity score matching results

Overall, the share of food-insecure households in the agropastoral areas in our sample was 32%, Table 1 shows the food intake and self-report show an improvement of food security for 4.5% and 7% households, respectively. On average food intake increases by 744.71 kcal/day/adult for treated households.

Table 1. Average Treatment Effects on the Treated (ATT) before and after matching

Variable	Sample	Treated	Controls	Difference	S.E.	T-stat
Kcal_AE_Day	Unmatched	4367.85	3575.21	792.65	214.43	3.7
	ATT	4367.85	3623.14	744.71	287.76	2.59***
Food intake	Unmatched	0.691	0.636	0.055	0.021	2.56
	ATT	0.691	0.646	0.045	0.029	1.55
Self report	Unmatched	0.733	0.614	0.119	0.021	5.6
	ATT	0.733	0.663	0.07	0.029	2.43***
CSI (continuous)	Unmatched	2.825	2.823	0.002	0.296	0.01
	ATT	2.825	2.224	0.601	0.401	1.5
CSI (dummy)	Unmatched	0.683	0.748	-0.065	0.02	-3.21
	ATT	0.683	0.77	-0.087	0.027	-3.18***

Source: Authors' calculations based on LSMS data (2019)

4.2 Random effects regression results

The results in from the random effect regression show that proximity to an LSLI increases the probability of being food secure, and this result holds for the measures Food Intake, Self-report, and kcal per day. We also include interaction terms of the treatment variable with market and road distance and the net effect was 330.7 kcal/day/adult. The control variables that significantly increase households' food security are land ownership, forest land, access to irrigation, and soil quality, household head's education and gender, access to roads, and participation in extension services, whereas the factors which reduce the likelihood of households to become food secure are borrowing money (credit), age of household head,

household size, and pursuing pure pastoralism. Livestock number and market distance does not have significant effect. Household income has a positive but small effect on food security in kilocalories per day.

5. Conclusion

About one third of the agropastoral communities in Ethiopia are suffering from food insecurity. The finding of this study shows that proximity to large scale land investments has no adverse implication on household food security measured by food intake and household self-report. This however does not mean that LSLIs have improved household food security as they actually denied them of access to pasture land. This is because of the relatively better pasture and water near to large scale land investments. The coping strategies index shows about 9% households become vulnerable to food shortage because of LSLIs (although the result is not statistically significant).

We suggest that policymakers release policies that guide large scale land investments to relate their investments to the livelihoods of the host communities, and ensure access to communal rangelands for better food security. Further research could be done to explore the linkage between LSLI local employment and livestock productivity in an agropastoral context.

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