

The Impact of Large-Scale Agricultural Investments on Welfare and Livelihoods of Local Communities: A Meta-Analysis

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- This study is supported by a research project "The Distributional Impact of Large-Scale Land Transactions in Ethiopia (ALL-IN-LSLTs)
- I am doing my PhD dissertation titled 'The Economic and Welfare Implications of Large-Scale Agricultural Investments in Developing Countries' Under the capacity building component of the project

Introduction

- Agricultural production in developing countries has remained low amid a substantial potential for growth ([Christiaensen et al., 2011](#))
- Exploiting this potential has been promoted to reduce poverty in rural areas where most the world's poorest people live ([FAO, 2012](#); [World Bank, 2008](#)).
- However, the sector was less attractive to investors and has been considered as the 'sun-set' industry until the 2007/08 global price rise in food and agricultural commodities.
- Land-based investments become more attractive to investors which has led to an intensified acquisition of large-scale land in the global south ([Deininger Byerlee, 2011](#); [Edelman et al., 2013](#)).

- Since 2000 more than 2200 LSAI deals involving more than 65m ha are conducted.
- Countries in Africa, Asia and LAC are the main destinations
- Major investors originate from;
 - DCs such as USA, Great Britain and the Netherlands and
 - LDCs such as Brazil and Malaysia that have competitive agriculture and
 - non-traditional actors such as Oil-rich Gulf States, South Korea, Japan, China and India

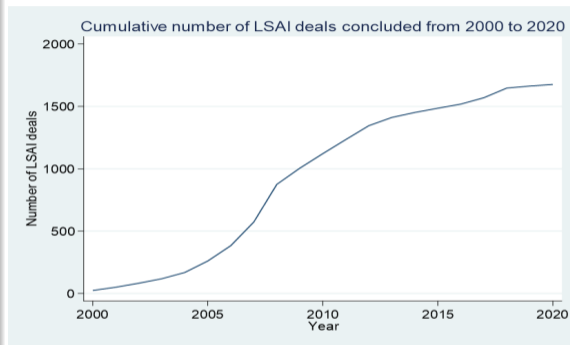


Figure: Cumulative number of LSAI deals concluded from 2000 to 2020

Origin and Destination of LSAs

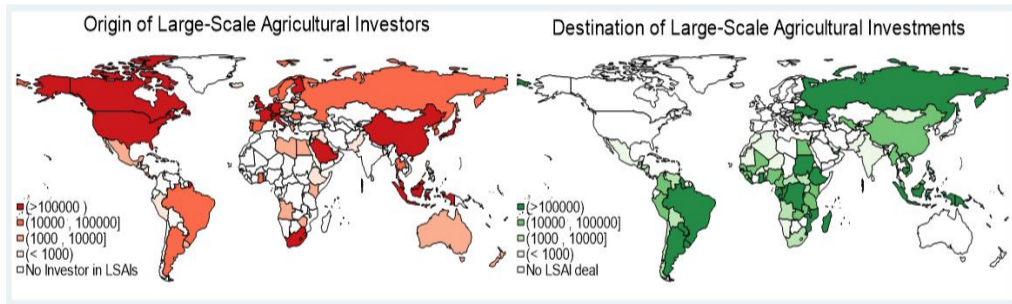


Figure: Distribution of LSAs by investor and recipient countries

- The pace of transfer, size of land involved and the effects on socio-economic development has become a cause of debate among media, human right activists and policy makers
- Proponents, during the beginning periods of LSAI expansion, including the World Bank, argue that;
 - LSAs will boost agricultural production and productivity through introduction of new capital and new technologies ([Deininger Byerlee, 2011](#))
 - New capital investments, in turn, enhances national agricultural output, encourage commodity exports, and then contributes to economic growth
 - LSAs reduce poverty in rural areas through the provision of employment for wage workers and opportunities for contract farming

- On the other hand, critics (human right activists and the media) argue that LSAs could slow growth in developing countries as most of such investments could alter rural developments and livelihoods (Borras Jr Franco, 2012; Edelman et al., 2013; Pearce, 2012; The Economist, 2009). Their main argument is;
 - the objective of such investments is to ensure the food security needs of investor countries which are usually from high- and middle-income countries on the expense of developing countries
 - It will result in dispossession of indigenous communities human and tenure rights
- After two decades, empirical evidence indicate that LSAs pose both positive and negative impacts on farm household outcomes

Negative Effects

The investments tend to concentrate on accessible, and densely populated areas ([Messerli et al., 2014](#)), competing over land with small holders ([Lay et al., 2021](#))

Cause displacements ([Lay et al., 2021](#)), loss of livelihoods ([Nkansah-Dwamena, 2021](#)), gender discrimination ([Hajjar et al., 2020](#)) and decline in income ([Shete Rutten, 2015](#))

Positive Effects

Improve agricultural productivity through spillovers, and resilience to shocks ([Ali et al., 2019](#))

Employment opportunities to the rural poor and improving the access to food ([Baumgartner et al., 2015](#); [Cotula et al., 2014](#))

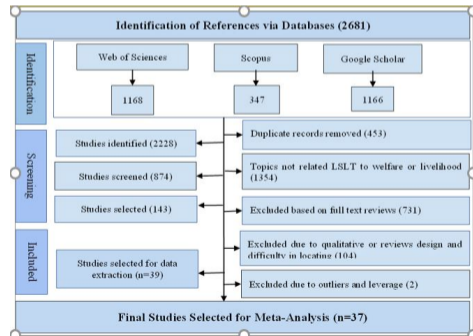
Increasing revenue and modernize the agriculture sector ([Cotula, 2009](#))

- However, evidences generated by previous studies on the welfare impacts of LSAs are **anecdotal and are based on case studies** which makes it difficult to generalize findings beyond the community level where LSAs carried out
- In addition, these studies reported both positive and negative impacts of such investments which further complicate policy actions.
- Thus, in this study we synthesized evidence using meta-analysis to show the general picture of LSAs impacts on local community welfare and livelihoods

Literature Search

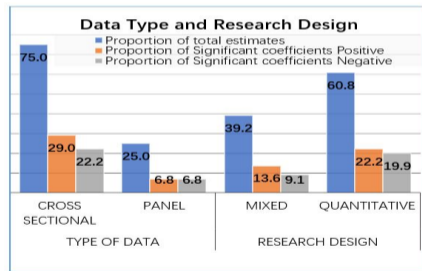
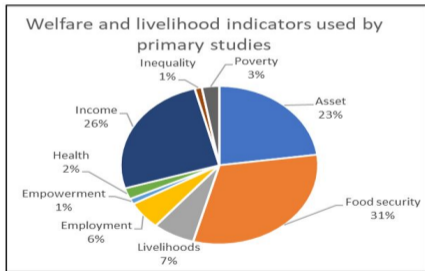
The systematic search and selection process is undertaken under the guideline for the meta-analysis of economics research-network (MAER-Net) by [Stanley et al. \(2013\)](#)

A combination of key words from LSAI and welfare and livelihood indicators are used. The search is undertaken in the topics and abstracts of papers in the period from Nov. 18, 2022 to Dec. 12, 2022.



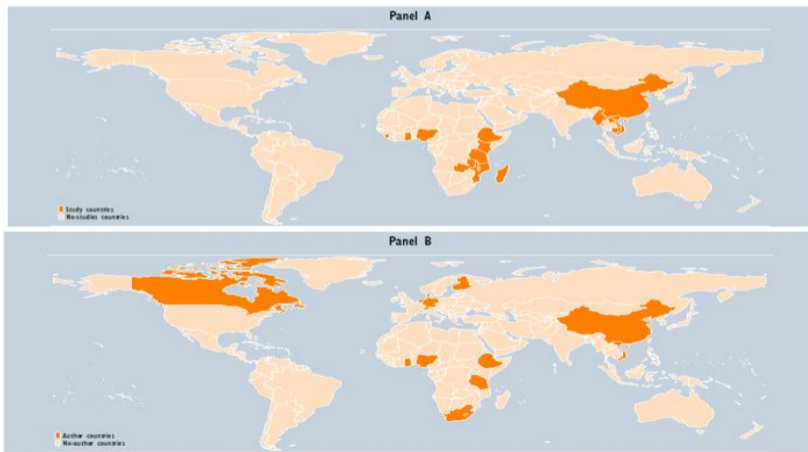
Description of Selected Studies

Welfare and livelihood indicators used by primary studies



Description of Selected Studies

Distribution of primary studies (Panel A) and their authors (Panel B)



Mean Effect Size (MES) Estimation

- The primary goal of our meta analysis is to obtain an effect size that show the over all impact of LSAIs.
- Partial correlations which is commonly used in economic meta-analysis literature is applied ([Cipollina et al., 2018](#); [Doucouliagos, 2005](#); [Doucouliagos Ulubasoglu, 2006](#); [Efendic et al., 2011](#); [Valickova et al., 2015](#))to calculate the mean effect size (MES) as;

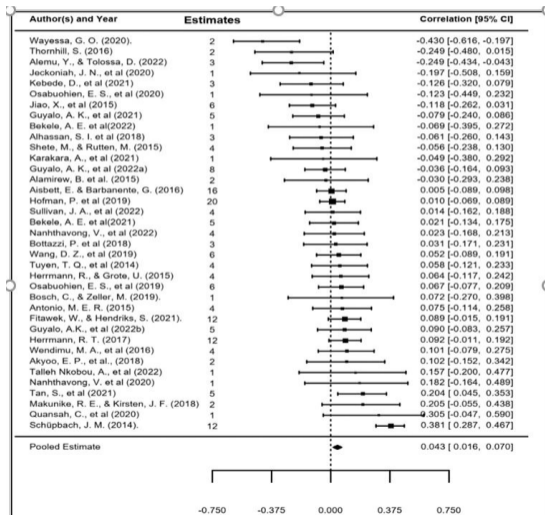
$$r_{ij} = \frac{t_{ij}}{\sqrt{t_{ij}^2 + df_{ij}}}$$

- The MES is based on the assumption of equal weight of the individual effect sizes which is implausible. We use the random effects model which relaxes this assumption to calculate the MES as;

$$r_{ij} = \theta + \mu_i + \epsilon_{ij}$$

where r_{ij} is the MES, θ represents the population effect size, $\mu_i \sim N(0, \tau^2)$ which indicates the between study variation and $\epsilon_{ij} \sim N(0, \nu_{ij})$ which is the error term that measures by how much the observed effect size deviates from the true effect.

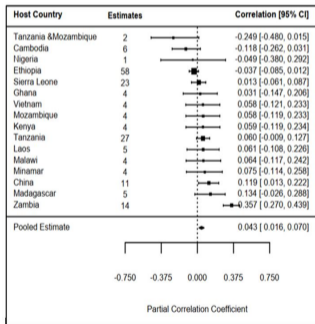
Results and Discussion: Over all MES



The over all MES is 0.043 which can be interpreted as small. The small MES sends a clear message that the association between expansion of LSAs and welfare and livelihoods is rather weak to meet the high expectations of implementing governments.

Sub-Group MES: LSAI Countries

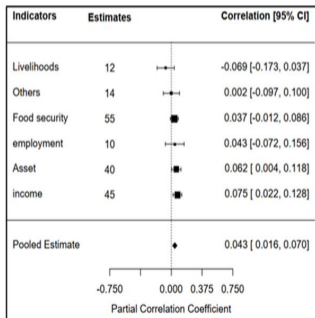
Policy relevant information emerge from the country-based estimates



- Homogeneity test reveals that the primary studies are significantly heterogeneous.
- The positive significant effect of LSAIs holds for most countries included in our synthesis
- However, the MES for Cambodia and Ethiopia turns out significantly negative signaling the deteriorating welfare and livelihoods of host communities due to the advent of LSAIs.

Sub-Group MES: Outcomes

Policy relevant information emerges from the outcome-based subgroup estimates as well.

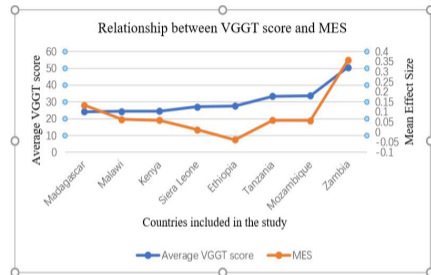
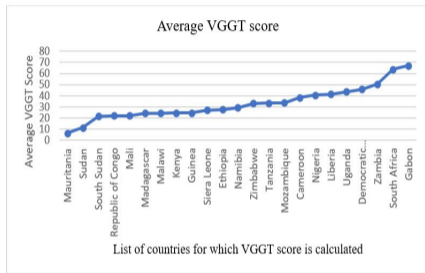


- Positive effect of LSAs on assets, food security, employment and income opportunities,
- negative for inequality, health, empowerment and resilience.
- It means that asset building, improved food security and increased income offer valid explanation for the observed overall positive effects of LSAs

Why MES is heterogeneous?

- Does differences in the land tenure and land governance systems explain the heterogeneity?
- To check this we resort in to the performance of the LSAI deals in compliance with the Voluntary Guidelines in Responsible Governance of Tenure (VGGT) principles
- After 10 years of monitoring, in 2022, the Land Matrix Initiative produced an evaluation report of the deals in African based on compliance with VGGT principles ([Anseeuw et al, 2022](#)).
- 23 countries, with a total of 730 deals, were assessed and indicated low level of compliance with 78 percent of all deals assessed show unsatisfactory levels of VGGT uptake and implementation; 20 percent of all deals assessed do not comply.

VGGT and MES



While we couldn't notice a significant association between VGGT scores and MES, countries with better VGGT score such as Mozambique and Zambia also recorded a relatively higher MES implying that better implementation of the VGGTs enable LSAs contribute towards the betterment of local communities' well-being

Publication Bias Test

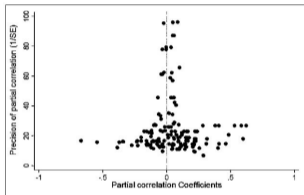


Table 3. The results of funnel asymmetry test and precision effect test (FAT-PET)

Dependent variable = t-stat	Coefficients	Standard Error	p-value
Constant ($\beta_0 - bias$)	-0.1692	0.6930	0.807
$1/SE_{ij}$ ($\beta_1 - Precision$)	0.0334*	0.0198	0.091
Within-study correlation	0.4094	0.0907	
Observations	176		
Number of Studies	37		

Note: Estimated using the mixed-effects multilevel model; * denotes significance at the 10% level.

We conducted publication bias test based on funnel plot and funnel asymmetry test and precision effect test (FAT-PET) The constant term is statistically insignificant and thus the null hypothesis can't be rejected at 10percent level. It implies that there is no publication selection bias in this study.

Meta Regression Analysis (MRA)

Table 4. Results of MRA to explain the source of heterogeneity in effect size of primary studies

Moderator Variables	Mixed effect model		Weighted Least squares	
	Coefficients	Standard Error (SE)	Coefficients	Robust SE
Precision ($1/SE_{ij}$)	36.568**	(17.921)	25.471*	(13.509)
Constant	-2.344***	(0.909)	-2.944***	(0.765)
Type of outcome variables used				
Welfare	0.028*	(0.017)	0.030	(0.020)
Research Design and Estimation characteristics				
Mixed research design	0.100**	(0.040)	0.098***	(0.027)
Impact evaluation	-0.021	(0.021)	-0.005	(0.022)
Sample size	-0.000	(0.000)	-0.000*	(0.000)
Data type	0.084**	(0.037)	0.122***	(0.026)
Reported Coefficient characteristics				
Sign of coefficient	0.115***	(0.013)	0.131***	(0.015)
Significant coefficient	-0.008	(0.015)	-0.006	(0.015)
Publication characteristics				
Publication status	-0.113*	(0.064)	-0.136***	(0.041)
Publication year	-0.018**	(0.009)	-0.013*	(0.007)
Impact factor	0.013	(0.042)	0.018	(0.027)
Regional differences				
LSAI country region	0.004	(0.045)	0.011	(0.036)
Author affiliation	0.058	(0.037)	0.048*	(0.028)
Observations	176		176	
Number of studies	37			
Within Study correlation	0.369	(0.118)		
Log restricted-likelihood	-453.991			
Adjusted R-squared			0.588	

Standard errors in parentheses

MRA offer the possibilities to model the sources and explanation about the observed heterogeneity in individual effect sizes among the primary studies. Type of outcome variables, Research design and Estimation characteristics and Reported coefficient characteristics are sources of variation in effect size of primary studies.

- A meta-analysis on 176 estimates extracted from 37 primary studies is conducted.
- The overall effect of LSAs turns out to be positive. In fact, the magnitude of the MES is quite small (0.043).
- The outcome-based sub-group analysis highlights on the mechanism through which the positive impact of LSAs operate. The results provide evidence for income and employment opportunities, asset building and improved food security as the main channels.
- The small mean effect-size and heterogeneity across countries may fairly be attributed to the poor implementation, monitoring and evaluation of LSAs.

- In relation to land governance, progresses have been made in ensuring LSAs become beneficial to local communities through regulatory and guiding frameworks such as
 - VGGTs (FAO, 2019) and Principles for Responsible Investment in Agriculture and Food Systems (RAIs) (CFS, 2014) at the international level and the
 - Framework and Guidelines on Land Policy in Africa (ALPC, 2010),
 - Guiding principles on large scale land based investments in Africa (UN and ECA, 2014) and
 - Guidelines on promoting responsible investment in food, agriculture, and forestry in Southeastern Asian Nations (ASEAN) (ATWGARD, 2018) at regional level

- Despite these progresses, the results of this study suggested that much remains to be done in the implementation of these guidelines to realize the transformational potential of large-scale land investments
- Even though the overall impact of LSAs are in favor of local communities, we find that primary studies do not provide information why the impact of LSAs are heterogeneous across countries.
- Evidence generated by the primary studies focused from assessment of a single investment project which makes it difficult to generalize findings beyond the community level where LSAs carried out

- Thus, future studies could use cross country information to explain this heterogeneity
- We also observed that the overall impact of LSAs at a national level, that could accrue in the form of increased agricultural production, agricultural exports, tax revenue etc., didn't get much attention in the existing literature.
- Existence of a fair amount of micro level studies to account the community level effects shows only one side of the problem.
- Future studies could also focus in accounting the impact of LSAs at national level.

Thank You!