ISSN 2532-5604

CSCC Centro di ricerca sulle Scienze Cognitive e la Comunicazione
Cognitive Science and Communication Research Centre

CSCC Working Papers 01/16

This land is my land! Large-Scale Land Acquisitions and conflict events in Sub-Saharan Africa

Sara Balestri* and Mario A. Maggioni*

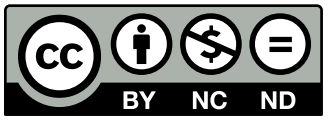
*CSCC and DISEIS Universitá Cattolica del Sacro Cuore, Milan

CSCC
Centro di ricerca in Scienze Cognitive e della Comunicazione
Università Cattolica del Sacro Cuore
Via Necchi, 5 - 20123 - Milano ITALY

La pubblicazione nella Collana CSCC Working Papers è soggetta a valutazione da parte di due referees indipendenti attraverso una procedura di valutazione *single blind*.

To be published in the CSCC Working Papers series the article must pass a *single blind* referee procedure by two independent referees.

CSCC Working Papers 01/16



CSCC Centro di ricerca in Scienze Cognitive e della Comunicazione
Università Cattolica del Sacro Cuore
Via Necchi, 5 - 20123 - Milano ITALY

ISSN 2532-5604
CSCC Working Papers
[Online]

This land is my land! Large-Scale Land Acquisitions and conflict events in Sub-Saharan Africa

Sara Balestri and Mario A. Maggioni*

Abstract

Through a spatially disaggregated approach to account for local characteristics and a quasi-experimental research design to overcome limitations due to missing georeferentiated information about land deals, we provide sound evidence that large-scale land acquisitions raise the likelihood of experiencing outbursts of organized violence, especially when oriented against civilians. The most striking result is that domestic acquisitions are particularly significant in explaining organized violence outbreak, suggesting that national concentration of power among elites matters for social stability. Extractive resources are found significant predictors of organized violence, confirming their role in the political economy of conflict events. Finally, results show the existence of significant spatio-temporal dependence path, since events of organized violence tend to be recurrent and to persist in space, feeding "neighbouring" effects of proximity and local patterns of violence concentration.

Keywords: large-scale land acquisitions, natural resources, conflict events, Africa

*CSCC (Cognitive Science and Communication Research Centre) and DISEIS (Department of International Economics, Institutions and Development), Università Cattolica del Sacro Cuore, L.go Gemelli, 1. I-20123 Milano (ITALY). Tel.: +39 02 7234 2302
Correspondence to: sara.balestri@unicatt.it

Earlier draft of this paper has been presented at the 16th Jan Tinbergen European Peace Science Conference, Università Cattolica del Sacro Cuore (Milan, IT), on June 20-22, 2016, and at the International Peace Science Society workshop on Environmental Security, University of Notre Dame, (South Bend, USA), on October 20, 2016. We warmly thank participants for their comments and observations. We would like to thank Simona Beretta for her valuable comments. The findings, interpretations and views expressed in this paper are entirely those of the authors; equal authorship implied.

Introduction

Recent global dynamics – such as demographic growth, changes in dietary choices in emerging countries, constraints in food supply, climatic uncertainties and financialization of commodity markets – have resulted in higher and more volatile agricultural commodity prices, giving raise to business opportunities and pushing renewed interest in agriculture. The crisis of mid-2000s has strengthened this trend by speeding global investments, including Large-Scale Land Acquisitions (LSLAs). Large acquisitions are not a new phenomenon, however the territorial extensions involved in land deals and the frequency of their occurrence characterize an unprecedented event (Anseeuw et al., 2012). They especially target low and middle income countries, where large amounts of suitable and non-cultivated land, beyond favourable economic conditions for leasing, are commonly present. Despite potential positive outcomes embraced by large acquisitions – such as investment in agricultural sector, higher employment rate and technology transfer – significant empirical evidence points out the perverse effects that these deals are producing on local communities. LSLAs are indeed likely to raise competing interests, changing entitlement rights to get access to land and land-related resources (including water), and deeply affecting in that way those basing their livelihoods on land or not holders formal rights of access. As result, grievances and social tensions might erupt and nurture dynamics of violence.

Despite a growing body of literature about the nature and the effects of LSLAs, the correlation with the occurrence of organized violence is still uncovered by systematic empirical analyses. Using a spatial disaggregated approach based on high-resolution data and a quasi-experimental design we explore the issue, providing evidence that large acquisitions positively impact on the likelihood of experiencing events of organized violence, especially against civilians.

The paper is organized as follows: section 2 provides an informative overview of the potential risks of LSLAs, framing the rationale of the analysis; section 3 describes the research design and model specifications, whereas section 4 introduces the variables used in the analysis. Section 5 provides the results of the empirical analysis and the following section summarizes the main findings of the study.

2. Large-Scale Land Acquisitions in Sub-Saharan Africa

The mid-2000s crisis, followed by a period of relatively high and volatile prices, gave rise to an unprecedented wave of transnational, large-scale land acquisitions (LSLAs) in low and middle income countries, mainly driven by the need to seek opportunities to secure food supplies overseas and the rising demand for biofuels. With no exceptions, these investments were set down on the expectation of rising costs of land and water as the world demand for food and food crops continues to expand. These factors fuelled a surge of interest in African land, given the presence of huge quantities of cheap available land, low labour costs and favourable climate for cultivations. Deninger et. al. (2011) notes that 29 million of the 56 million hectares of land (51.8%) sought after by foreign investors globally is located in sub-Saharan Africa. Indeed, countries with fairly abundant non-forested and non-cultivated land with agricultural potential attracted more interest (Gurara and Birhanu, 2012).

Probably the most impressive case is that of Democratic Republic of Congo where almost 50% of the arable land is either leased to foreign companies or under negotiation for leasing (Friis and Reenberg, 2010).

African countries have largely welcomed such investments by agreeing on corresponding land deals, as the possible deriving advantages are tempting. Indeed, the leasing of unused land[2] to foreign governments or companies figures as an efficient strategy to solve a long-standing neglect of investments and infrastructures in agriculture, given the structural inability to attract significant investments in this sector for many of them. Thus, allowing large acquisitions by international investors is meant as tool to boosting an underdeveloped sector, creating new job opportunities and promoting technological transfer, as well as foreign exchange generation. Unfortunately, most of these countries are also characterized by poor records of rural land tenure, lack of reliable institutions able to protect rights of vulnerable groups, and a very limited culture of disclosure and transparency. Such weak institutional framework is likely to compromise possible positive outcomes, rather to make room to adverse effects threatening social stability and human rights protection. The former Special Rapporteur for the right to food De Schutter, clearly pointed out that whilst such investments provide certain development opportunities, they also represent a threat to food security and other core human rights (2009). The majority of deals, indeed, are characterized by little oversight, weak transparency, no inclusion of environmental safeguards and failure to protect smallholder farmers from losing their customary rights to use land[3].

Finally, it deserves to be mentioned also that although international deals gained the larger media coverage, large acquisitions carried out by domestic investors are on the rise as well (Cotula and Vermulen, 2010; Deininger et al.,2011). From our point of view, these cases should be taken particularly into account since they mirror power distribution of elites across a country.

Bearing in mind the social, economic and environmental implications of LSLAs, as referring to highly contested processes of governance and to large possible impacts on livelihoods and human rights, large acquisitions have recently become a key research topic in the current debate on development of the global South (see for instance, De Schutter 2011; Cotula, 2012; Fairhead et al., 2012; White et al., 2012; Messerli et al. 2014). Although the prominence of the phenomenon and the large media coverage that it gained pushed a fast growing body of literature, special attention to the accuracy and reliability of results, due to methodological shortcomings and prominent focus given to anecdotal case studies, should be paid in order to derive sound policy implications (Oya, 2013). In addition, some specific effects of the recent wave of LSLAs remain uncovered, in particular those relating to grievances escalation and local dynamics of social violence.

Few studies have empirically analysed the issue so far, providing meaningful insights about involved dynamics, although with mixed results (Borras et al., 2013; Thaler, 2013). LSLAs are found to exacerbate competition over land and raise inequality among groups through a process of social and economic exclusion, thus nurturing social tensions and increasing the

[2] The formal definition of land as "unused" should not mislead to decontextualize analysis: often, pastoralists or other indigenous communities, for example, might traditionally access to specific areas without being classified as proper users, given a common lack of rights recognition and entitlement for these groups.

[3] As result, large-scale land acquisitions are generally known as "land grabbing" events.

probability of conflict outbreaks (Jensen and Søensen, 2012). LSLAs further aggravate the overall inability to tackle land-related conflicts in developing countries (Deininger et al., 2011; Collier and Hoeffler, 2005), and may be a concurrent cause of civil conflicts and social disorders when "heavy weight" actors take advantage of their coercive power, or form alliances with military active third parties in order to accumulate land (Grajales, 2011).
We argue that an underestimated concern refers to the possibility that growing pressures over land, implying major changes in land use and entitlements, might fuel resource conflicts with negative distributional effects, and sustain latent conditions of social instability and violence. In particular, when large acquisitions involve areas characterized by the existence of important gaps between customary and traditional usage rights on land, and formal rights guaranteed through entitlement, the risk of conflicts is higher (De Schutter 2009).
Tensions with local communities, indeed, could give rise to a downward spiral of violence and even conflict (Deininger, 2011). Furthermore, LSLAs are concluded also in countries having experienced conflicts events in the past: those countries are especially susceptible to a relapse into violence and the effects produced by large acquisitions might exacerbate tensions and long-lasting hatreds, facilitating violence outburst[4].

3. Research Design

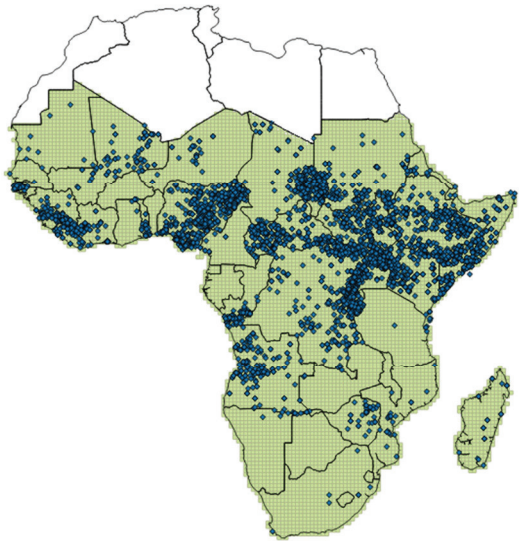
This paper aims at examining whether LSLAs are systematically associated with events of organized violence, or tend to occur in contexts that are already conflict-prone, where institutions are likely to be weak and people may be displaced. Further, we analyze whether the local concentration of foreign investments in land may feed violence diffusion, supporting "neighboring" effects. To detect these patterns, we linked the best available set of geo-referenced data on land deals occurred in Sub-Saharan Africa (2000-2014) with selected geospatial indicators, as local proxies of conflict determinants.
To account for sub-country and local scale characteristics, the methodological approach we propose is based on a spatially disaggregated analysis carried out on an exogenously space built as a standardized spatial grid of 0.5x0.5 degrees regular cells (PRIO-GRID structure v2.0, Tollefsen et al. 2012).
We therefore constructed a dataset covering 8375 cells – corresponding to Sub-Saharan African countries – and combined georeferenced data on conflict events and a large set of cell-level covariates.

To the best of our knowledge, the most comprehensive and updated dataset on LSLAs is Land Matrix which reports all known land deals *i)* involving the sale, lease, or concession of land; *ii)* entailing a transfer of user rights in land from smallholders and communities to commercial users; *iii)* covering an area greater than 200ha; *iv)* having been announced or concluded since 2000[5]. Large acquisitions are generally supported by nebulous information around the legal terms applied, with significant levels of secrecy on deals which make the accessibility of information on the issue a well-known problem (Anseeuw et al., 2012). The

[4] This does not imply that organized violence is necessarily oriented to land issues (and thus violent events should be understood as land conflicts only); rather, this study is meant at assessing if LSLAs might contribute in fuelling broader dynamics of violence
[5] Data are accessible to http://landmatrix.org/en/.

exact geographical location of the deals does not differ from such common problem of lack of information. On March 2016, for instance, when we drew data from Land Matrix portal, only 72 land deals concluded in Sub-Saharan Africa were holding reliable geo-referentiation, whereas the majority (697 entries) were not characterized by sufficient information to be spatially located. Nonetheless, dynamics of organized violence are affected by local conditions and involve only limited parts of a country, making the adoption of a spatially disaggregated approach necessary in order to get accurate and sound results (Buhaug and Lujala, 2005; Buhaug et al., 2011; Balestri and Maggioni, 2014). The geographical location of large acquisitions is therefore essential to properly model potential relations between organized violence and land deals. Even though the number of deals with missing geo-referentiation is likely to be overestimated with possible duplications of entries (Anseeuw et al., 2012), their exclusion accounts for a relevant percentage of total recorded deals, leading to possible bias towards policy derivation.

Figure 1 *Locations of events of organized violence and LSLAs, 2000-2014*



Locations of events of organized violence

Locations of large-scale land acquisitions

The innovative contribution of this study is the proposal of the use of a quasi-experimental design to deal with this limitation and rigorously explore the issue. The experimental design is structured as follows: we plot the 72 deals with precise coordinates; having knowledge of the territorial extension of the deals, we derive a radius measure by assuming a circular area for each large acquisition. Applying the exact location of deals as centroid, we use the radius to identify which cells are involved, at least partially, in a large acquisition. Through this procedure, we identified 95 grid cells which constitute the "treated" group in the sample ("treated" meaning having experienced LSLA). We subsequently construct a "control" group with similar characteristics, with the exception of being involved in a large acquisition. In order to construct the control group, we applied a first neighbouring matching technique by

selecting all cells belonging to the first order of territorial contiguity given the adopted grid structure, thus identifying 455 cells. In this way, it is reasonable to catch areas sharing very similar geographic and socio-political features with the "treated" group. Such similarity has been validated by the fact that mean values of all covariates in the "control" group stay within 1 standard deviation with respect to mean values of the "treated" group[6]. Using territorial contiguity reasonably allows excluding the possibility that a (unrecorded) large acquisition has been concluded within control group cells; since information collected by Land Matrix directly comes from the field and local media, it is arguable that if there had been deals in neighbouring cells also, they would be known as well. For this reason we preferred a first neighbouring matching to a pure matching pairs technique. A last consideration regards the distribution of events of organized violence, which involves 16% of cells, whereas that value was 18% in the total Sub-Saharan original sample, with no statistically significant differences.

Table 1 *Comparison reduced and complete sample*

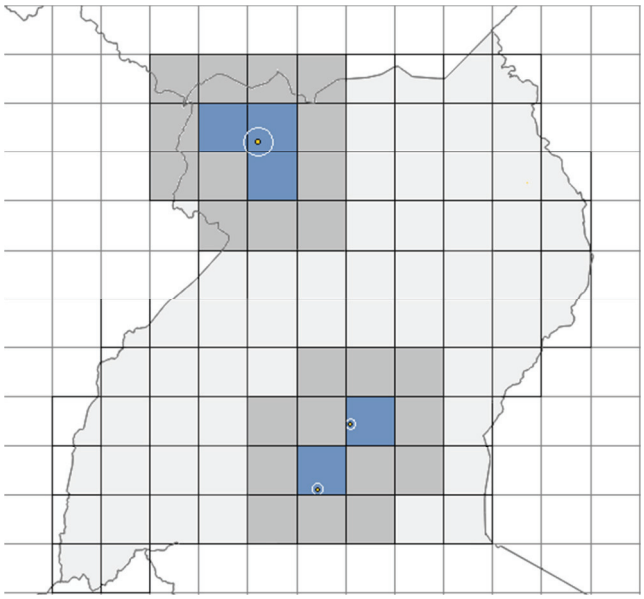
sample	mean value for conflict events	n_cells with conflict events	%total cells
reduced (550 cells)	9.488	88	16%
complete (8375 cells)	9.977	1532	18%

Therefore, the resulting reduced sample (550 cells) is consistent with the original distribution of conflict events and is structured into two sub-samples distinguished by the characteristic of having been involved in a large acquisition only. It should be mentioned also that this quasi-experimental design is largely unbalanced towards "control" group cells which show up almost 5 times higher in number than cells belonging to the "treated" group. In other words, since the reduced sample is operatively constructed with a large majority of non-LSLA cells, if land controls will be found significant predictors of violence, policy implications can be derived on a sound and reliable results.

Figure 2 provides an example of the selection procedure applied to Uganda. The three orange dots represent the location of the LSLAs occurred in the country during the period of observation. Their territorial extension is approximated by the white-fill circle, given the radius measure calculated; therefore all cells touched by this area are coded as belonging to the "treated" group (in blue). That means, for instance, that large acquisition in the upper-left side covers a geographical extension which touches two other cells, whereas the other large acquisitions are included within the area of a single cell. After this first step, we selected the first order of neighbouring cells (in dark grey) to compose the "control" group. The country identification is coded as attribute for each cell and it is applied to control for heterogeneity among the sample.

[6] Paired t-tests (or Mann-Whitney test for non-normal distributions) confirm that the two sub-samples are not statistically different.

Figure 2 *Example of cells selection for the reduced sample, Uganda*



This study is grounded on the argument that large acquisitions deeply impact on traditional land use implying radical changes, and on the rights to access to the resource, producing growing pressures over land, which in turn might fuel social instability. To empirically assess whether there is a systematic correlation between LSLAs and events of organized violence, we adopted the quasi-experimental design previously described and explored the issue in a cross-sectional setting and, subsequently, in a longitudinal panel analysis to catch possible causal relations. Since the dependent variable (namely the number of events of organized violence) is a count data characterized by a large presence of zero observations and over-dispersion, we adopted a zero-inflated negative binomial (ZINB) estimation strategy for the cross/sectional analysis[7].

This model derives results from two separate processes which divide observations into "certain zero", that means in our study not experiencing any event of organized violence for the whole period of observation, with probability φ. These structural zeros are estimated by logit model. For the purposes of this work, we are particularly interested in the outcomes of the logit estimation, in other words to the probability that events of organized violence may occur, where the role of large acquisitions and extractive resources is tested. The second process analyses the other observations which may assume both positive value and zero with probability (1 – φ). This process follows a negative binomial distribution. We hypothesize that the number of events of organized violence actually observed in a given cell *i* at time *t* are a function of several factors, as:

$$events_{it} = f(W*events_{it}, LS_{it}, NR_{it-1}, GF_{i}, CL_{it}, SP_{it}, IN_{I}, \varepsilon_{i})$$

[7] Vuong test confirms that a zero-inflated negative binomial specification better predicts our response variable than a standard negative binomial specification (z=-0.01; Pr>z = 0.5033)

where *W*events* denotes a spatial lag of the response variable, *LS* represents a set of alternative variables coding specific characteristics of large acquisitions occurred in a given cell *i* at time *t*; *NR* represents a set of dummy variables coding the presence of extractive resources within a cell *i* at time *t-1*; *GF* represents a set of variables coding geographical features for each cell *i*; *CL* represents a set of variables for climate variability measured at cell unit *i* at time *t*; *SP* represents a set of variables for socio-political characteristics calculated for each cell *i* at time *t*; *IN* represents a set of variables coding the institutional setting for each country *I*, and, finally, an error term is included. To reduce heterogeneity across the sample, errors are robust and clustered at cell unit.

The second stage of the empirical analysis is based on the estimation of a balanced panel, to avoid possible concerns about reverse causality, structured on 5-years periods. We adopted this methodological choice for two main reasons: temporal information on LSLAs may suffer from temporal gaps given the fact they largely derive from local media coverage; and having knowledge that a negotiation process is ongoing might already produce effects in terms of social stability regardless the time needed to arrive to a formal deal. We therefore decided to use far-reaching time span covering 5 years in order to catch these smoothed potential effects. The resulting panel is composed by 3 periods, for a total number of 1650 units of observations. Given that ZINB estimation techniques are not supported by standard statistical software for panel data, and that the presence of excess zeros and over-dispersion would have led to unreliable estimates in case of adoption of a negative binomial model, we decided to give prominence to the analysis of probability for events of organized violence to occur. We therefore applied a panel logit estimation technique after having modified the response variable into a binary outcome.

The longitudinal analysis follows a similar approach to the cross-sectional one, with the most general specification as

$$P\,[events_{it} = 1 | X_{i,I,t}] = f(W*events_{it},\ Y_{t-1},\ LS_{it}, NR_{it-1}, GF_{i}, CL_{it},\ SP_{it},\ IN_{I},\ \varepsilon_{i})$$

where Y_{t-1} denotes a temporal lag for the response variable and all the other terms are defined as above. We subsequently include additional time lags to control for large acquisitions occurred in the previous period.

4. Variables description and descriptive statistics

Dependent Variable – We calculated a measure of organized violence occurred in any given cell as the total number of conflict events occurred during the whole period of observation (for the cross-sectional analysis) and each year (for the longitudinal analysis). Data about events of organized violence are gathered from the UCDP-Georeferenced Event Dataset, v.4 (Sundberg and Melander, 2013) which classifies as an event any incident of lethal violence, providing a specific georeferenced location and date, where armed force was used by an organised actor, against either another organized actor or civilians, and resulted in at least one direct death. Through the georeferenced information provided, we verified the

spatio/temporal distribution of such events. In the sample used in the analysis, composed by 550 regular cells, only 16% of them underwent organized violence, suggesting that the totally reported 835 events tended to cluster in space, and occur in a limited geographical area. Being aware of the bias which might affect reliability of results in case of not treatment of spatial dependence in the dependent variable (Balestri and Maggioni, 2014), we checked if this descriptive insight is sustained by empirical evidence. We therefore run a statistical test for spatial dependency (Moran's I), founding a positive and significant spatial autocorrelation in the dependent variable (p-value=.000), although limited in magnitude (coefficient: 0.065). This result confirms that the spatial processes promoting the observed pattern of values is not random chance, said in other words, when neighbouring areas are subject to violence downturns, proximity effects make for a given cell more likely to experience events of organized violence as well. We control for such dependency by introducing a spatially lagged variable (*W_events*) of the number of events (*events*), where W is an inverse distance weight matrix (row standardized) constructed on the first order of neighbouring cells, given the grid structure adopted. Finally, we argue that events targeting civilians might be particularly associated with the occurrence of a LSLA, whose effects are likely to impact on local communities by altering livelihoods and entitlements rights. For this reason, we introduced the binary variable *civilians* to control whether at least one event of organized violence was perpetrated against civilians in a given cell.

Explanatory Variables – The main explanatory variable applied in this study is the occurrence of a LSLA: we want to test whether the raise of competing interests and grievances which are likely to be generated from this kind of investments impacts on organized violence. Information about large acquisitions, including their geographical locations and known characteristics, is gathered from Land Matrix.

As stated in the research design section, since 2000 in the area under investigation 72 large acquisitions are reported, involving, at least partially, 95 cells (approximately 17% of the sample)[8]. The average area of these investments corresponds to 317.6 square km, although large variations in geographical extension characterize the deals: Ghana, Dem. Rep. of Congo, Liberia and Sudan are the countries reporting the widest acquisitions. Looking at the first intention declared in the deal, it is evident that the high international demand for food crops and biofuels drives these investments, being their cultivation the main aim justifying the acquisition. It should be mentioned that in the sample almost 85% of the large acquisitions are international deals, involving foreign actors as major investors placed both in the global North (UK, Italy, USA) and South (Malaysia, South Africa, China), confirming the raising trade power of emerging countries and the relevance of South-South connections. We code multiple dichotomous variables to catch distinguishing characteristics of the deals; in particular the variable *agrofuels land deal* takes the value of 1 if the main intention of the deal is the cultivation of food crops or biofuels, 0 otherwise. The variable *failed land deal* indicates whether a deal has been negotiated (or at least announced), but not established, taking the value of 1, 0 otherwise. The deal failure might be the outcome of local turmoils triggered by the effects generated by the disclosure of ongoing negotiations about a LSLA:

[8] The list of countries and corresponding cells involved in LSLAs is provided in Annex I.

for this reason, we check whether there is a systematic correlation between such events. A third variable, namely *domestic land deal*, takes the value of 1 if the main investor is placed within the same country. Although the majority of large acquisitions are concluded by foreign investors (as in our sample), domestic deals might reveal latent fragmentation lines across the country based on economic power, ethnic affiliation or socio-political identity. We therefore verify whether domestic deals may constitute a driver for violence.

A second set of explanatory variables is composed by indicators measuring the presence of lootable extractive resources. It is well-documented issue the role that extractive resources with high economic value can assume during wartime, acting as both driver for wealth accumulation and financing channel of fighting expenditures (Collier and Hoeffler, 2002; Ross, 2004; Humphreys, 2005). Through geo-referenced information about mining sites, we code two variables taking the value of 1 if, respectively, gold or diamonds deposits (*minerals*) and oil or natural gas (*hydrocarbons*) fields are present within the cell extension, 0 otherwise. To avoid reverse causality, a positive value is given only in case that the deposit was active at the beginning of the period of observation. Information about locations of extractive resources sites are gathered from the dataset Goldata v.2 (Balestri, 2015), Diadata (Gilmore et al. 2005) and Petrodata (Lujala et al., 2007). In the sample, 7 cells are involved in a large acquisition and are characterized by the presence of gold or diamonds deposits; whereas only 2 LSLA/cells record hydrocarbon deposits.

Assuming that local conditions matter to increase the possibility of conflict outbreak and the opportunity to sustain warfare activities, we introduce several variables to control for sub-national characteristics.

Geographical attributes play a relevant role in shaping conflict dynamics, thus two measures, based high-resolution raster data provided by respectively the UNEP's Mountain Watch Report (2002) and Globcover 2009 dataset, for the percentage area in each cell covered by respectively mountains and forests are included. As regards climatic characteristics, we control for annual average precipitations (log transformed) based on monthly meteorological statistics from the GPCP v.2.2 Combined Precipitation Data Set (Huffman et al., 2012). Since climate variability might affect conflict risk, we adopt also a proxy for drought measured as the deviation from normal long-term rainfall levels in the last month of the rainy season, based on the Standardized Precipitation Index derived from CAMS_OPI precipitation dataset. Clearly, these variables vary across time, therefore for the cross-sectional analysis we compute an average value over the period, whereas in the longitudinal analysis we apply 5-yearly average values.

Another set of regressors features socio-political attributes such as the distance from own country borders and the capital city (both drawn from PRIO-GRID, 2015); the number of excluded groups (discriminated or powerless) on the status and location of politically relevant ethnic groups settled in the cell for the given year, as defined in the GeoEPR/EPR v.2 dataset; and the population density, measured in the first year of period of observation to avoid reverse causality (data from the Gridded Population of the World v.3). Finally, we consider the institutional framework of a country, including the capacity to channel grievances towards peaceful confrontations, matters when observing the occurrence of conflict events. Since a democracy regime is more than a set of representative institutions, embracing institutionalized procedure through which political and social conflicts are resolved

(Przeworski, 1995), it is argued that more democratic regimes are less likely to going through periods of warfare. Therefore, we introduce a variable (*instability*) which takes the value of 1 if a country experiences a downturn of at least two levels in the Polity IV score, 0 otherwise; and a second control for democratic regimes (*democracy*) according to Polity IV definition.
All control variables, complete of descriptive statistics and original sources, are summarized in Appendix 1.

5. Empirical Analysis

To assess the role of large acquisitions on events of organized violence, this study follows a twofold strategy: a cross-sectional analysis based on average values over the period is aimed at identifying systematic correlation between phenomena; subsequently, a longitudinal analysis explores more closely the nexus by assessing the existence of causal relation.

Cross-sectional analysis. Table 2 summarizes the results of the first stage of analysis. The models specification starts with the inclusion of the more general measure of occurrence of LSLA, and proceeds by alternating specific characteristics of land deals, namely those intended to food crops and biofuel cultivations (Mod. 1.2), those failed (Mod. 1.3) and, finally, domestic ones (Mod.1.4). The last specification (Mod. 1.5) considers all characteristics together to account for overlapping effects.
The logit part of the model clearly confirms the soundness of our intuition: whatever the characteristic considered, where large acquisitions occurred (or have been at least negotiated) the likelihood of observing events of organized violence is higher, since the probability of being an excess zero is reduced. Interestingly, although data suggest that the cultivation of food crops and biofuel is actually the major driver behind investment intentions as commonly argued, the association of these kind of acquisitions with the occurrence of organized violence is less significant that other deal characteristics. Once all characteristics are taken together (Mod. 1.5), the *food_biofuels land deal* variable does not reach anymore a significant level. On the other hand, where large acquisitions failed or are domestic investment the probability of observing events of organized violence is steadily significant. Extractive resources are confirmed highly correlated with the likelihood of violence outbreak in a given cell, regardless the model specification.
The negative binomial part of the models explains the positive count in the response variable, namely the number of events of organized violence. The most meaningful results can be summarized as follows. We found clear evidence that violence tends to cluster in space and, therefore, neighbouring effects matter in determining the recurrence of conflict events in a given area: the spatial lag of the response variable is indeed positive in sign and steadily significant at 1% in every model specification chosen. Events of organized violence occur more likely closer to the capital city, that means the political and often economic power of a country, since the higher the distance the fewer the events recorded.
Results suggest that higher rainfall precipitations influence, on average, violence dynamics at local level by raising the number of events of organized violence. This could be explained by the fact that the opportunity cost of fighting decreases with water abundance, and therefore violence is more likely to break out with respect to a situation of water scarcity.

Table 2 *Cross-sectional analysis, results.*

Zero-Inflated Negative Binomial (ZINB) models
Dep. Var.: number of events of organized violence

	(1.1)	(1.2)	(1.3)	(1.4)	(1.5)
NEG BIN					
W_events	0.3776***	0.4034***	0.3959***	0.4135***	0.4102***
	(0.1061)	*(0.1122)*	*(0.1112)*	*(0.1156)*	*(0.1130)*
border distance	0.0017	0.0013	0.0013	0.0012	0.0012
	(0.0010)	*(0.0011)*	*(0.0010)*	*(0.0011)*	*(0.0010)*
capital distance	-0.0008**	-0.0008**	-0.0008**	-0.0008*	-0.0008**
	(0.0004)	*(0.0004)*	*(0.0004)*	*(0.0004)*	*(0.0004)*
Mountains	0.2446	0.4003	0.2991	0.4319	0.3521
	(0.6621)	*(0.6479)*	*(0.6903)*	*(0.6803)*	*(0.6933)*
Forest	0.0050	0.0063	0.0066	0.0063	0.0069
	(0.0066)	*(0.0069)*	*(0.0065)*	*(0.0070)*	*(0.0068)*
ln precipitations	1.9981***	1.9863***	1.9444***	1.9949***	1.9543***
	(0.7304)	*(0.7217)*	*(0.7205)*	*(0.7398)*	*(0.7395)*
Drought	-0.0947	-0.0991	-0.0569	-0.1009	0.0582
	(0.3835)	*(0.3916)*	*(0.3868)*	*(0.4005)*	*(0.3978)*
land deal	-0.5051				
	(0.5244)				
food_biofuel land deal		0.1540			0.0505
		(1.2330)			*(0.4791)*
failed land deal			-2.3137***		-2.4094***
			(0.4349)		*(0.5259)*
domestic land deal				1.6328	1.5985
				(1.5381)	*(1.4673)*
Minerals	-0.4508	-0.4350	-0.4527	-0.3674	-0.3879
	(0.5116)	*(0.5370)*	*(0.5367)*	*(0.5419)*	*(0.5517)*
Hydrocarbons	0.8867	0.8047	0.8255	0.9248	0.8947
	(0.5513)	*(0.7546)*	*(0.6248)*	*(0.5954)*	*(0.6342)*
population density	-0.1771	-0.1435	-0.1419	-0.1261	-0.1194
	(0.1913)	*(0.1583)*	*(0.1677)*	*(0.1380)*	*(0.1328)*
marginalized groups	0.1116	0.0924	0.1205	0.1407	0.1729
	(0.3378)	*(0.3293)*	*(0.3328)*	*(0.3329)*	*(0.3327)*
Instability	0.4045	0.4634	0.5805	0.5496	0.6687
	(0.4303)	*(0.4344)*	*(0.4331)*	*(0.4338)*	(0.4293)
Democracy	-0.2337	-0.2203	-0.1981	-0.1465	-0.1212
	(0.3659)	*(0.3571)*	*(0.3703)*	*(0.3361)*	*(0.3354)*
Civilians	4.0991***	4.0864***	4.1158***	4.1142***	4.1478***
	(0.2999)	*(0.2933)*	*(0.2968)*	*(0.2954)*	*(0.2964)*
LOGIT					
land deal	-2.118***				
	(0.464)				
food_biofuel land deal		-2.112*			-1.564
		(-1.221)			*(1.9692)*
failed land deal			-18.909***		-8.948***
			(0.7540)		*(0.9304)*
domestic land deal				-16.296***	-16.846***
				(0.9401)	*(1.2679)*
Minerals	-16.767***	-16.950***	-18.390***	-18.711***	-22.843***
	(0.412)	*(0.389)*	*(0.3854)*	*(0.3798)*	*(0.3893)*
Hydrocarbons	-16.662***	-17.466***	-19.264***	-16.866***	-16.791***
	(1.278)	*(1.220)*	*(0.8760)*	*(0.8613)*	*(1.1733)*
Observations	550	550	550	550	550
Pseudo R2	0.312	0.311	0.314	0.314	0.318
AIC	*721.153*	*722.825*	*719.389*	*719.279*	*723.787*

*Significance levels: * p<0.1, ** p<0.05, ***p<0.01. Robust standard errors clustered at cell unit*
W= inverse distance weight matrix, row standardized

We control also through the variable *civilians*, taking value 1 if at least one event occurred in a given cell was characterized by use of armed force against civilians; in other words, we control for one-sided events as coded in UCDP-GED dataset. The results are highly informative and clearly interpretable: where violence is oriented towards civilians, we found a large and significant recurrence of violence within the same area, leading to higher number of events.
Finally, as regards extractive resources and large acquisitions, in other words the major presumed drivers for organized violence occurrence, evidence suggests that these elements although highly significant in explaining the likelihood of experiencing violence, are uncorrelated with the number of events. The only exception is represented by failed large acquisitions, which are significant also in the negative binomial part of the model and negative in sign. This is coherent with the theoretical framework we propose: if LSLAs facilitate violence outbreak, where these deals fail the number of events of organized violence recorded during the whole period of observation in a given area is lower respect to what happens in case of a no-failed deal.

As robustness check, we verified the consistency of results by re-estimating the final model specification (Mod. 1.5), being the preferred one, by a logit model: in this way, we avoid the concern about count data, by transforming the response variable into a dichotomous measure of occurrence of organized violence. Part of the richness of original data goes lost, since we cannot account for the cumulative incidence of events; however, it is possible to soundly verify the results obtained in terms of correlation to the likelihood of organized violence, which represents the core part of this study. It deserves to be mentioned that the alternative codification for the dependent variable adopted for robustness check estimation is now highly correlated with the *civilian* variable, given the fact that around 80% of cell having experienced at least one event of organized violence, are characterized as well by one-sided violence. A Pearson's correlation coefficient of 0.8750, significant at 5%, excludes the possibility to use both binary variables in the same model. We therefore decided to run Mod.1.5 through a logit estimation technique firstly on the total number of events (Mod. 2.1), and, subsequently on one-sided events only (Mod. 2.2). Results are shown in Table 3.
The results provide a clear support to the analysis carried out so far. Among different characteristics of land deal the analysis accounts for, being a domestic investment is strongly correlated to a higher likelihood of experiencing both events of organized violence and events against civilians. This component suggests that where large acquisitions are concluded by domestic investors, such areas are more prone to outbursts of violence and thus social instability. Extractive resources are positively and significantly correlated to the likelihood of observing conflict events, although they lose part of their explanatory power (in particular, hydrocarbons are no more significant) when controlling for one-sided events only.

Table 3 *Robustness checks for cross-sectional analysis*

LOGIT models

	Pr(events)	*Pr(civilians)*
	(2.1)	(2.2)
W_events	0.7241***	1.8207***
	(0.1301)	*(0.2783)*
border distance	-0.0002	0.0007
	(0.0015)	*(0.0017)*
capital distance	-0.0002	0.0000
	(0.0004)	*(0.0005)*
mountains	1.0344*	1.5303**
	(0.5449)	*(0.5932)*
forest	0.0005	-0.0059
	(0.0067)	*(0.0071)*
ln precipitations	0.7624*	0.6394*
	(0.3994)	*(0.3594)*
drought	-1.1057**	-1.1281**
	(0.4331)	*(0.4683)*
food_biofuels land deal	0.1928	0.0911
	(0.5472)	*(0.6873)*
failed land deal	0.3714	1.0410
	(0.9567)	*(0.9994)*
domestic land deal	1.8554**	1.4713**
	(0.7494)	*(0.7425)*
minerals	1.0483**	1.0344*
	(0.5058)	*(0.5782)*
hydrocarbons	2.7946**	1.5118
	(1.3565)	*(3.0428)*
population density	-0.1245	-0.0655
	(0.1280)	*(0.0714)*
marginalized groups	0.5028**	0.5717**
	(0.2556)	*(0.2633)*
instability	0.5298	-0.0912
	(0.4677)	*(0.5646)*
democracy	-0.2450	-0.1467
	(0.3432)	*(0.3830)*
Observations	*550*	*550*
R-squared	*0.333*	*0.327*
AIC	*356.705*	*316.059*

*Significance levels: * p<0.1, ** p<0.05, ***p<0.01.*
Robust standard errors clustered at cell unit.
W= inverse distance weight matrix, row standardized

Among the other regressors, the roles of spatial clustering process of events as well as of rainfall precipitations (although with reduced explanatory power) are basically confirmed.
Interestingly, in both Models 2.1 and 2.2 the variable *drought* turns significant, casting light to the role of climate variability; in particular, if the average deviation from long-term normal rainfall during last month of rainy season increases, the likelihood of observing events of organized violence is higher. This is consistent to the outcomes previously found for rainfall precipitation levels. Also two other variables, namely *mountains* and *marginalized groups*, turn significant when we limit the analysis to a binary response variable, regardless considering all events or only those perpetrated against civilians. We can now argue that, on the basis of these results, where an area is characterized by a higher percentage of

mountainous terrain[9], local conditions seems to be more favourable for violence to rise. It is worth noting that cells involved in a domestic LSLA or closer to capital city are characterized by a higher percentage of mountainous terrain in their territorial extension (Table 3). This is relevant to read these results in comparison to Table 2 where, for instance distance from capital city was significant[10]. Indeed, it could be that these characteristics drive the result for *mountains* variable.

Table 3 *Mountainous terrain characteristics*

	domestic land deal		**distance from capital city**	
	Yes	*no*	*<376km*	*>376km*
% mountainous terrain	48.25%	29.51%	31.71%	26.32%
n_cells	7	301	207	101

Note*: sub-sample composed by 308 cells with at least one percentage point of territorial extension characterized by mountainous terrain*

As regard the second regressor now significant, namely the number of marginalized group, the interpretation is straightforward: higher social fragmentation reflected into exclusion of specific groups in the society is associated with a higher likelihood of observing events of organized violence. It deserves to be noted that this effect is larger is we consider only events perpetrated against civilians (Mod. 2.2).

Longitudinal analysis. As described in Section 3, the second stage of our empirical strategy is based on the result of a longitudinal analysis based on a panel data organized on five-years periods. Being a ZINB estimation technique not viable for panel data through standard statistical software, we adopted a logit model in order to verify the existence of a causal path (Table 4). The temporal dependence is assessed by the introduction of a temporal lag of *events*, measuring the number of events of organized violence occurred in a given cell in the previous period. We included also a temporal lag for the predictors of large acquisitions, in order to verify their potential causal role[11]. Thus the analysis is run on totally 1100 observations. Following the methodological choices adopted in the cross-sectional analysis, errors are robust and clustered at cell unit to correct for heterogeneity across the sample. The following table summarizes the results. More precisely, Mod.3.1 and 3.2 use the total number of events recorded for each period as dependent variable, whereas Mod.3.3 and 3.4 refer to events of organized violence against civilians only.

[9] In the sample, 56% of cells show at least a percentage unit of their territorial extension characterized by mountainous terrain. Among these 308 cells, mountainous terrain represents almost 30% of their area, on average.

[10] We remind that whereas ZINB estimations simultaneously account for the positive count and probability of observing an outcome, LOGIT models account for probability only, regardless the cumulative number of events occurred in the same spatial unit.

[11] Regarding failed land deals, 3 failures out of 6 were reported occurring in the third period of observation (2010-2014), thus the construction of temporal lags does not include these operations by construction. The resulting three failed land deals characterize cells not experiencing any events of organized violence, therefore since failure is perfectly predicted the three observations are automatically removed from the sample. To maintain constant the total number of observations we removed the temporal lag for failed land deal from the models, given the fact that results are not affected by this removal neither in sign and significance levels. Results are available upon request.

Table 4 *Longitudinal analysis*

Panel Logit model

	Pr(events)	*Pr(events)*	*Pr(civilians)*	*Pr(civilians)*
	(3.1)	(3.2)	(3.3)	(3.4)
W_events	0.2318***	0.2288***	0.2861***	0.2816***
	(0.0492)	*(0.0500)*	*(0.0573)*	*(0.0577)*
events t-1	0.0866**	0.0872**	0.1510**	0.1538**
	(0.0401)	*(0.0402)*	*(0.0726)*	*(0.0691)*
border distance	0.0040**	0.0044**	0.0020	0.0026
	(0.0020)	*(0.0021)*	*(0.0017)*	*(0.0017)*
capital distance	0.0008	0.0009	0.0022***	0.0023***
	(0.0006)	*(0.0006)*	*(0.0005)*	*(0.0005)*
mountains	1.3579*	1.3189*	1.0706	1.0527
	(0.7746)	*(0.7877)*	*(0.7494)*	*(0.7649)*
forest	-0.0108	-0.0104	-0.0412***	-0.0425***
	(0.0115)	*(0.0117)*	*(0.0114)*	*(0.0120)*
ln precipitations	0.4275	0.4083	0.5433**	0.5015**
	(0.3231)	*(0.3166)*	*(0.2124)*	*(0.1971)*
drought	-0.1676	-0.1757	-0.4512	-0.5464
	(0.4321)	*(0.4444)*	*(0.4081)*	*(0.4202)*
food_biofuels land deal	-0.7091	-0.5114	-0.6764	-0.6470
	(1.1667)	*(1.0053)*	*(0.9095)*	*(0.9293)*
failed land deal	2.2199	1.9229	2.7126**	2.5087**
	(1.3563)	*(1.2977)*	*(1.2727)*	*(1.1805)*
domestic land deal	3.5576***	3.7866***	3.2851***	3.4855***
	(1.2723)	*(1.2515)*	*(1.0858)*	*(1.1820)*
food_biofuels land deal t-1		1.1858		0.5057
		(1.0484)		*(1.2390)*
domestic land deal t-1		3.3081**		3.7998***
		(1.6449)		*(1.0951)*
minerals	1.4174*	1.4274*	1.2669*	1.3516*
	(0.8141)	*(0.8198)*	*(0.6990)*	*(0.7388)*
hydrocarbons	4.5653***	4.3945***	3.1772**	3.1955***
	(1.5028)	*(1.4051)*	*(1.2286)*	*(1.1086)*
population density	0.0005**	0.0005**	0.0004**	0.0004***
	(0.0002)	*(0.0002)*	*(0.0001)*	*(0.0001)*
marginalized groups	1.1014***	1.1563***	0.7450***	0.8345***
	(0.3008)	*(0.3029)*	*(0.2247)*	*(0.2300)*
instability	0.5558	0.6044	0.9322	0.9915
	(0.7231)	*(0.7288)*	*(0.5838)*	*(0.6059)*
democracy	-0.4737	-0.4545	-0.9859*	-0.8541
	(0.6006)	*(0.6026)*	*(0.5192)*	*(0.5325)*
Observations	*1100*	*1100*	*1100*	*1100*
AIC	*308.669*	*308.404*	*258.4039*	*252.8336*

*Significance levels: * p<0.1, ** p<0.05, ***p<0.01. Robust standard errors clustered at cell unit*
W= inverse distance weight matrix, row standardized

Results interestingly disclose different paths for events of organized violence with respect to those perpetrated against civilians, beyond strongly confirming the causal role of large acquisitions in raising the likelihood of experiencing violence.

Regardless of model specification, the spatial lag of the dependent variable is steadily positive and highly significant, confirming the role of neighbouring effects in determining the cumulative incidence of organized violence in a given area. It deserves to be noted that also the temporal lag of conflict events is consistently positive and significant providing evidence

that violence tends to be recurrent, since having experienced organized violence in the previous 5 years makes more likely to going through violent downturns again.
Among the different characteristics of large acquisitions we included in the analysis, domestic investments are strongly confirmed as major predictor for events of organized violence, even against civilians, thus it empirically corroborates our research hypothesis. We found indeed that growing competing interests and change in land rights entitlement implied by LSLAs largely impact on the likelihood of violence outbreak, fuelling local dynamics of instability. Extractive resources are confirmed as well in their explanatory power, especially when hydrocarbons deposits are active within a given cell.
The longitudinal analysis allows revealing the impact of other socio-political features also: densely populated areas and those characterized by higher number of marginalized groups show a higher probability to be theatre of events of organized violence.
As far as concern specific dynamics of type of organized violence, it is worthy to note that when we limit the analysis to one-sided events (Mod. 3.3 and 3.4), failed acquisitions occurred during the same 5-years period largely and positively impact on the probability of outburst of organized violence against civilians. This might be explained by the active role that local communities are likely to assume in case that LSLAs deeply touch their livelihoods and their right to access to land, giving room to turmoils and disorders. This instability could be also enumerated among the reasons why a negotiation failed, as happened for instance in Madagascar where large protests against South Korea's Daewoo Corporation committed to lease 1.3 million hectares of land, resulted also in an increasing support for the expulsion of President Ravalomanana in March 2009 (Ratsialonana et al., 2011).
Looking at the other significant covariates, whilst the probability of occurrence of a violent event in a given cell rises as the distance from borders increases, when organized violence is oriented against civilians a higher distance from capital city matters on the probability of the event occurrence. Said in different words, in our sample general organized violence tends to take place far from borders, thus producing less transnational spill-overs, whereas the likelihood of one-sided events tend to occur far from the political power centres.

Conclusions

This study empirically assesses the existence of a systematic correlation and causal relation between Large-Scale Land Acquisitions (LSLAs) and events of organized violence, in the light of the substantial impacts that these investments might generate in terms of raising competing interests, changes in land use and rights to access to the resource. Such impacts are argued to nurture local dynamics of tension and social instability, feeding possible paths towards violence outbreak.
Through a spatially disaggregated approach to account for local characteristics and a quasi-experimental research design to overcome limitations due to missing georeferentiated information about large acquisitions, we provide sound evidence that LSLAs positively impact on the risk of conflict events, raising the likelihood of experiencing outbursts of organized violence. The most striking result is that domestic large acquisitions are particularly significant in explaining organized violence outbreak, suggesting that national concentration of power among elites matters for social stability. As expected, stronger association is found when events of organized violence are oriented against civilians, since

(unarmed) local communities are those most affected by LSLAs and they are likely to voice their claims and promote disorders. Extractive resources, namely diamonds, gold and hydrocarbons, are found significant predictors of organized violence, confirming their role in the political economy of conflict events. Finally, results show the existence of significant dynamic diffusion path (which we measured as statistically significant spatio-temporal dependence) since single events of organized violence tend to be recurrent and persist in space, feeding "neighbouring" effects and local patterns of violence concentration.

References

Anseeuw W. et al., (2012). T*ransnational land deals for agriculture in the Global South: Analytical report based on the Land Matrix database.* Retrieved from: http://www.landcoalition.org/fr/publications/transnational-land-deals-agriculture-global-south

Balestri, S. (2015), GOLDATA. The Gold deposits dataset codebook v.2., CSCC Working Paper 2015(1), Università Cattolica del Sacro Cuore, Milan.

Balestri, S. & Maggioni, M. A. (2014). Blood Diamonds, Dirty Gold and Spatial Spillovers. Measuring conflict dynamics in West Africa. *Peace Economics, Peace Science and Public Policy*, 20(4), pp. 551–564.

Blyth, S. et al., (2002). *Mountain Watch: environmental change & sustainable development in mountains.* UNEP-WCMC Biodiversity Series 12. ISBN: 1-899628-20-7

Bontemps, S. et al., (2009). *Globcover 2009*. Products Description and Validation Report. European Space Agency.

Borras, S. M., & Franco, J. (2013). Global land grabbing and political reactions 'from below'. *Third World Quarterly*, 34(9),1723-1744.

Buhaug, Halvard; & Päivi Lujala (2005) Accounting for Scale: Measuring Geography in Quantitative Studies of Civil War, *Political Geography* 24(4): 399–418.

Buhaug, H. et al. (2011). It's the Local Economy, Stupid! Geographic Wealth Dispersion and Conflict Outbreak Location , *Journal of Conflict Resolution* 55(5): 814–840.

Center for International Earth Science Information Network (CIESIN) and Centro Internacional de Agricultura Tropical (CIAT) (2005). *Gridded Population of the World, Version 3 (GPWv3): Population Count Grid*. Palisades, NY. doi:10.7927/H4639MPP. Accessed 03.06.2013.

Collier, P. and Hoeffler, A., (2002). Greed and grievance in civil war, Oxford University, Centre for the Study of African Economies, Working Paper 2002-01.

Collier, P. and Hoeffler, A. (2005). Resource Rents, Governance, and Conflict. *Journal of Conflict Resolution* 49 (4):625-633.

Cotula L. et al. (2014). Testing Claims about Large Land Deals in Africa: Findings from a Multi-Country Study, *The Journal of Development Studies*, 50:7, 903-925.

Cotula, L. (2012). The international political economy of the global land rush: A critical appraisal of trends, scale, geography and drivers. *Journal of Peasant Studies*, 39(3–4), 649–680.

Cotula, L. et al., (2009). Land grab or development opportunity? Agricultural investment and international land deals in Africa. London/Rome: IIED/FAO/IFAD.

Deininger, K., et al. (2011). *Rising Global Interest in Farm-land: Can it Yield sustainable and Equitable Benefits?*, Washington, D.C.: The World Bank.

de Schutter, O. (2011). How Not to Think of Land-Grabbing: Three Critiques of Large-scale Investments in Farmland, *Journal of Peasant Studies* 38(2): 249–79.

de Schutter, O. (2009). *The right to food and a sustainable global food system*, Contribution for the 17th session of the UN Commission on Sustainable Development (CSD-17), 4-15 May 2009, New York.

Fairhead, J., Leach M. and Scoones I. (2012). Green Grabs: A New Appropriation of Nature?, *The Journal of Peasant Studies* 39(2): 237–61 (Special Issue).

Friis, C. and Reenberg, A. (2010). *Land grab in Africa: Emerging land system drivers in a teleconnected world*. Copenhagen: GLP International Project Office, University of Copenhagen.

Gilmore, E., et al. (2005). Conflict Diamonds: A New Dataset, *Conflict Management and Peace Science*, vol. 22, no. 3, pp. 257–272.

Grajales J. (2013). State Involvement, Land Grabbing and Counter-Insurgency in Colombia, *Development and Change*, 44(2): 211–232

Gurara D.Z. and Birhanu D., 2012. *Large-scale Land Acquisitions in Africa*, African Development Bank: Africa Economic Brief, Issue 5 (3).

Humphreys, M. (2005). Natural resources, conflict, and conflict resolution: Uncovering the mechanisms. *Journal of Conflict Resolution,* 49(4), 508–537.

Jensen P.S. and Sørensen T.V., (2012). Land inequality and conflict in Latin America in the twentieth century, *Defence and Peace Economics* 23(1), 77-94.

Lujala, P., (2007). Fighting over Oil: Introducing A New Dataset. *Conflict Management and Peace Science*, 24(3), 239-256.

Messerli P. et al. (2014). The geography of large-scale land acquisitions: Analysing socio-ecological patterns of target contexts in the global South, *Applied Geography*, 53, 449-459.

Oya, C. (2013). Methodological reflections on land 'grab' databases and the land 'grab' literature 'rush'. *Journal of Peasant Studies*, 40(3), 503–520.

Ratsialonana, A. et al., (2011). *After Daewoo? Current Status and Perspective of Large-Land Scale Acquisitions in Madagascar*, Rome: Observatoire du Foncier à Madagascar, CIRAD, ILC.

Ross, M.L., (2004). What do we know about natural resources and civil war?. *Journal of peace research*, 41 (3), 337-356.

Sundberg R. and Melander E. (2013). Introducing the UCDP Georeferenced Event Dataset. *Journal of Peace Research*, 50(4), 523-53.

Thaler K, (2013). *Large-Scale Land Acquisitions and Social Conflict in Africa*, Food Sovereignty: A Critical Dialogue - Conference Paper n.22, Yale University.

Tollefsen, A.F., Strand H. and Buhaug H., (2012). PRIO-GRID: A unified spatial data structure. *Journal of Peace Research*, 49(2): 363-374.

Vogt, M. et al., (2015). Integrating Data on Ethnicity, Geography, and Conflict: The Ethnic Power Relations Dataset Family. *Journal of Conflict Resolution*, 59(7), 1327-1342.

White B. et al., (2012). The New Enclosures: Critical Perspectives on Corporate Land Deals', *Journal of Peasant Studies* 39(3–4): 619–47 (Special Issue).

Wolford W. et al, 2013. Governing Global Land Deals: The Role of the State in Rush for Land, Development *and Change*, 44(2), 189-210.

Annex

Table A1 *Summary Statistics*

SUMMARY STATISTICS

Total number of observations: 550 units (grid cells)

Variable	***Description***	***Mean***	***Std.Dev.***	***Min***	***Max***	***Source***
Events	number of conflict events per cell over the period 2000-2014	1.518	8.874	0	159	UCDP-GED, 2015
land deal	dummy variable for LSLA in a cell	0.172	0.378	0	1	LandMatrix 2013
food_biofuels land deal	dummy variable for LSLA with primary intention food or biofuels cultivation in a cell	0.063	0.244	0	1	LandMatrix 2013
failed land deal	dummy variable for failed LSLA in a cell	0.010	0.103	0	1	LandMatrix 2013
domestic land deal	dummy variable for domestic LSLA in a cell	0.163	0.126	0	1	LandMatrix 2013
border distance	distance to own border (km)	104.898	101.434	0.278	456.2	PRIO-GRID, 2015
capital distance	distance to capital city (km)	376.201	339.320	9.028	1910.5	PRIO-GRID, 2015
mountains	mountainous terrain as share of cell area (percentage)	16.767	26.214	0	100	UNEP 2002
forests	forested terrain as share of cell area (percentage)	37.645	27.234	0	98.3	Globcover, 2009
precipitations	average precipitation per cell over the period 2000-2014 (mm)	1209.282	470.980	26.337	2289.1	GPCP/NOAA, 2015
drought	average deviation from long-term normal rainfall during last month of rainy season	-0.092	0.352	-0.921	0.604	CAMS_OPI
minerals	dummy variable for diamonds and gold deposit in a cell	0.061	0.241	0	1	DIADATA, 2005; GOLDATA, 2015
hydrocarbons	dummy variable for the presence of hydrocarbon deposits	0.007	0.085	0	1	PETRODATA, 2015
marginalized groups	number of excluded groups per cell	0.270	0.501	0	2.642	GeoEPR-ETH, 2014
population density	population density at 2000, cell level	1.154	11.325	0.005	258.3	CIESIN, 2005
instability	dummy variable for negative change of two levels in Polity scores	0.123	0.329	0	1	Polity IV
democracy	dummy variable for democracy	0.507	0.500	0	1	Polity IV
civilians	dummy variable for at least an event against civilians	0.127	0.333	0	1	UCDP-GED, 2015

Table A2 *Compositions of the reduced sample, by cell*

Reduced Sample composition

country	*n_cells*	*n_cells "treated" group*	*n_cells "control" group*
Angola	9	1	8
Benin	7	1	6
Botswana	8	3	5
Burundi	1	0	1
Cameroon	8	1	7
Congo (Brazzaville)	38	11	27
Congo (Democratic Republic)	16	2	14
Côte d'Ivoire	7	1	6
Ethiopia	31	4	27
Gabon	11	1	10
Ghana	27	5	22
Guinea	19	6	13
Kenya	7	2	5
Liberia	18	3	15
Madagascar	26	4	22
Mali	4	0	4
Mauritania	4	0	4
Mozambique	57	9	48
Namibia	10	1	9
Nigeria	12	1	11
Rwanda	2	0	2
Senegal	25	6	19
Sierra Leone	20	3	17
South Africa	8	1	7
Sudan[12]	22	2	20
Swaziland	4	1	3
Tanzania	42	6	36
The Gambia	1	0	1
Uganda	31	5	26
Zambia	55	12	43
Zimbabwe	20	3	17
total	***550***	***95***	***455***

[12] It includes territories of both Sudan and South Sudan after its creation.