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Determinants of biofuel-oriented land acquisitions in Sub-Saharan Africa

Giorgia Giovannetti [a,b], Elisa Ticci [c,*]

[a] Dipartimento di Scienze per l'Economia e l'Impresa, University of Florence, via delle Pandette, 9 50127 Firenze, Italy
[b] Robert Schuman Centre for Advanced Studies, European University Institute, Via dei Roccettini, 9 San Domenico di Fiesole, Firenze, Italy
[c] Department of Economics and Statistics, University of Siena, Piazza San Francesco, 7-8, Siena, Italy

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ABSTRACT

The recent surge of investors' interest for African land has triggered the debate about the drivers and effects of the so-called land grabbing. After a review of the relationship between investment in land and biofuel development in Sub Saharan Africa, we contribute to the existing literature in four dimensions. We use the updated version of Land Matrix whose potentialities are currently underexploited; we concentrate on land deals for cultivating biofuel crops which are emblematic of the food-land-energy nexus; we focus on FDI to the African continent, the most targeted region for land grabbing. Finally, we delve deeper into the influence of institutional quality by testing the role of different institutional dimensions. We find that abundance of water resources and general business conditions, security and regulatory quality facilitate the investment in land for biofuels. As for land governance, what matters is the strength and security of land tenure rights rather than the type of tenure system.

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1. Introduction

The last 10 years have witnessed a renewed interest in agriculture and land investments for production of food and energy crops. Sub-Saharan Africa (SSA) is at the forefront of this trend [20,22,8]. Since it simultaneously faces food insecurity [27], widespread poverty, scarcity in energy supply [51], and high vulnerability to climate change [44], SSA could benefit from farmland investments but at the same time is subject to several risks. The close nexus between land, water and energy in SSA is well represented in the biofuel sector, as investments for bioenergy feedstock production are likely to be associated with land acquisitions and increasing competition and pressures on water resources. Earlier contributions have assessed: (i) the sustainability implications of biofuel development on the continent ([4, 30]), (ii) recent foreign land acquisitions' challenges and opportunities [18,22,33]; the prevailing drivers of international land deals at global level [20,9].

This paper links these strands of the literature by concentrating the analysis on a specific subset of land deals, namely on transnational and large-scale land acquisitions targeting SSA with the purpose to produce first generation biofuels. Estimating the main determinants of these investments, we propose some reflections on their risks and impacts. Moreover, we contribute to the debate

* Corresponding author.
E-mail addresses: giorgia.giovannetti@unifi.it (G. Giovannetti), ticci4@unisi.it (E. Ticci).

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on the scale and geography of these investments. We rely on a large dataset on global land deals, the upgraded Land Matrix Globally Observatory which, though not yet immune to data limits, has addressed the initial criticisms on controversy, opacity, incompleteness and political sensitivity in monitoring and measuring large-scale land transactions [9,20,53,62][1]. Land Matrix provides detailed information on a range of dimensions: type of sources, status of negotiations (intended, concluded, failed), intention of investments and cultivated crops for agricultural land deals, investor and target countries. We are able to identify biofuel-oriented large-scale transactions, which are more likely to be accurately documented. We select only land deals with concluded contracts and documented by direct sources of information, namely from companies, contracts or official government records, while we exclude intended and failed negotiations and deals reported only by media, research documents and personal communications.[2]

These data confirm that international land investments disproportionally target SSA countries and are particularly interested in cultivation of biofuel crops. Since 2000, SSA has attracted about 41 percent of worldwide large-scale land deals to cultivate at least one crop that can be used as biofuel feedstock covering almost half of the global targeted area for this purpose (i.e. 7.3 million out of 14.2 million hectares)[3]. Furthermore, in SSA, international land acquisitions for biofuel crops account for a share of about 49 and 54 percent in terms of total number of deals and in covered area, respectively[4]. Biofuel-related projects in SSA are very heterogeneous, but large international acquisitions with the purpose to cultivate biofuel crops are one of the main forms of investment. According to Land Matrix data, foreign investments represent more than three quarters of all land deals for biofuel crops in SSA. Hence, identifying the factors triggering this type of investment decisions helps understand to what direction the prevailing trends of biofuel market are proceeding.

Section 2 briefly discusses the biofuel market in SSA. Sections 3 and 4 describe the methodological approach and the data used. The estimates and a discussion of covariates of land demand for biofuel crops are in Section 5. Section 6 concludes.

2. Biofuels in Sub-Saharan Africa

Sub-Saharan Africa is a marginal player in the biofuel market, but its role is increasing. In 2011, with an estimated ethanol production of 145 ML, Africa still accounted for only 0.17% of global production [55,56][5]. The first African large-scale biodiesel plant was inaugurated in Zimbabwe in 2007 and in 2009 was still operating at less than 5 percent of its capacity because of problems in the availability of raw materials. In several African countries, biofuel projects present problems of economic viability [46,57]. However, the biofuel sector in SSA still offers investment opportunities. Indeed, Africa has a big potential for production of bioenergy since it accounts for the largest share of world's estimated non-protected grassland and woodland areas potentially suitable for the main biofuel feedstocks (maize, cassava, soybean, jatropha) and large areas of Africa's cultivated land are also potentially suitable for biofuel crops (Fig. 1a and b).

International investors are aware of this potential bioenergy wealth and some African countries have become the most targeted areas of land acquisitions for biofuel projects. Data from the Land Matrix Global Observatory clearly show this rising land demand. SSA accounts for 40–50 percent of worldwide international deals for crops than can be used as biofuel feedstocks, both in terms of land acquired and number of deals and regardless the type of information sources and negotiation status (Fig. 2).

This trend represents both an opportunity and a risk. Traditional use of biomass from wood and agriculture residues is the main source of energy in the continent. However, under current practices and available technologies, is not viable, can have unintended negative consequences on health, cause an excessive workload, especially for children and women, and create negative environmental pressures. There are some technical solutions to these problems in the use of unprocessed (wood, dung, agricultural residues) biomass as energy source [52], but biofuel and biogas are regarded as new and more efficient forms of carbon-based renewable energy. Liquid biofuels can be used in the transport sector without significant changes in the existing infrastructure and can be harnessed for non-transport applications too (cooking, lighting, and electricity-generation, see [48]).

Diversification of income sources in rural areas, employment creation, improvement in energy security and reduced dependence on oil imports, foreign currencies earnings from biofuel exports, and reduction in GHGs emissions could be considered positive effects. The risks are, however, many. Expanding biofuel production can lead to increasing competition and pressures on water, land and forests. These effects moreover might be particularly strong in situations of weak land tenure and land rights. Furthermore, there is a consensus on the upward pressure of biofuels on food prices, despite a considerable variation in the estimates of its magnitude [64]. The carbon balance of biofuel expansion is also quite disputed. Net mitigation of GHG emissions is positive when land conversions for biofuel production are not considered, but the contribution of biofuels in mitigating climate change pressure is largely contested when land use changes are computed [43]. All these concerns have induced FAO, IFAD and the

[1] The second version of Land Matrix, released in June 2013 and constantly updated, attempts to embody comments received during the first stage of the project (2012–2013) when the first (Beta) version of the dataset was launched. On the evolution of the Land Matrix dataset see Anseeuw et al. [8].

[2] Some authors [21] till express concerns about the comprehensiveness of the information contained in the Land Matrix since it is based on publicly available sources. However, the continuous crosschecking and revision of this dataset have considerable improved its reliability and accuracy. Other datasets based on data collection through systematic inventories and limited fieldwork [21] or through additional information sources, such as financial databases and CIFOR in-country research (Schonevald, 2014), might be available. However, these datasets cannot integrate or complement Land Matrix data because, relying on different criterions of classification and inclusion, are not fully comparable or because they cover only a small set of countries (Ethiopia, Ghana and Tanzania in the study by [21]).

[3] Authors' calculations based on Land Matrix data (accessed in March 2014). This figure includes land deals for cultivation of at least one biofuel crop and it is based on information from governments, companies and contract documentation regarding concluded contracts. When we consider all types of information sources (also media, policy and research reports and personal communications) for all stages of negotiation (also intended and failed contracts), land deals for biofuel crops cover 14.3 and 29.5 million of hectares in SSA and worldwide, respectively. The difference in the definition, geographical coverage and data source (2012 Beta version of Land Matrix rather than second one) explains why this figure does not exactly match the data reported in Anseeuw et al. [6]. This report indicates that in Africa large-scale land deals for biofuel production cover 18.8 million of hectares, which correspond to 66 percent of total land acquisitions on the continent for all targeted sector (industry, other agricultural commodities, mining, forestry, tourism) and to 50 percent of global land deals for biofuel crops.

[4] Authors' calculations based on Land Matrix data (accessed in March 2014). The figures are calculated as a share of land deals for both agriculture and non-agriculture sector. When we restrict the analysis to only agriculture land deals with known crops, the share of biofuel-related land deals increases to more than 68 percent.

[5] Data for Africa are not easily found for more recent years, since the Renewable Fuel Association insert the continent into "Rest of the World". Locke and Henley [45] discuss these issues and present the different sources of data for 5 African main ethanol producers.