Japanese Large-Scale Land Deals as Drivers of Socio-Ecological Change in the Global South

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Abstract

Large-scale land deals are new drivers of socio-ecological change. This paper explores Japanese participation in land grabbing. Data from the Land Matrix are used to show that Japanese capital has been involved in land purchases in Asia, Africa and South America. The main goals of these land deals are to produce agro-commodities for energy generation and industrial production, and to develop forestry plantations. These productive activities, founded on the land rights formally transferred through these deals, generate massive changes in land use and land cover. This paper also discusses the potential transformations in local tenure and economic systems, and the increased dependency of national economies on foreign direct investment stemming from biomass energy production and forestry. The findings of this study confirm that investment in non-food agro-commodities and biofuels is one of the drivers of large-scale land deals. Finally, this research suggests that a comprehensive approach combining land use and land cover change with social-ecological systems approaches viewed through the lens of political economy/ecology is needed for an understanding of the complex drivers and effects of the global land rush.

Key words: Global South, Japan, land grabbing, Land Matrix, land use and land cover change

1. Introduction

Farmland has once again become a commodity of interest for capitalist investment (Deininger *et al.*, 2011; Anseeuw *et al.*, 2012a; White *et al.*, 2012). This interest has led to the proliferation large-scale land deals (LSLD), which characterize the so-called land grabbing or "land rush." LSLD is a global process whereby land rights are transferred from farmers and/or recipient (of the deals) countries in the Global South to corporations and countries in the North (Zoomers, 2010; Rulli *et al.*, 2013). Through this renewed North-South link, corporations and foreign governments gain access and control of land and water in the Global South generating a "foreignisation" of space (Zoomers, 2010; Rulli *et al.*, 2013). This new foreign space is used to produce agro-commodities (*i.e.*, foodstuffs, bioenergy, industrial crops, trees); develop extractive industries (*e.g.*, mining and oil), tourism, conservation of nature (*i.e.*, protected areas); and speculate on cheap land for quick purchase, to be kept out of production until agro-commodity prices and land values rise (UNCTAD, 2009; Zoomers, 2010; Cotula, 2012).

This paper aims to evaluate the extent of Japanese investment in LSLD and its potential effects on the recipient countries. In doing so, it contributes a case to a needed in-depth analysis of socio-environmental drivers and consequences of land deals and the responses to them, integrating perspectives of "political economy, sociology and ecology" (Borras *et al.*, 2011).

Since 2000, more than 80 million hectares of land have been bought or leased to private investors or foreign governments through hundreds of reported LSLD (Borras Jr. & Franco, 2012; Cotula, 2012; Rulli *et al.*, 2013; Heinimann & Messerli 2014). Globally, the extent of land involved in LSLD corresponds to 0.7% to 1.75% of the planet's agricultural land (Rulli *et al.*, 2013).

Using the Land Matrix, Heiniman and Messerli (2014) estimated that the main targets of large-scale land deals are Africa (56.2 million ha), Asia (17.7 million ha) and Latin America (7 million ha). At the global scale, 11 countries are responsible for approximately 70% of the surface involved in the deals (Anseeuw *et al.*, 2012b). In some countries, the growth in land deals is exceptional. Laos, for example, experienced 2,600 deals in the last decade that involved 1.1 million ha of land, which is roughly 5% of the country's land area (Heinimann & Messerli, 2014).

This renewed interest in land as an asset was likely triggered by the 2008 food-price spike and the global financial crisis (Zoomers, 2010). However, the interest in land, both local and overseas, can be traced back to colonial times and the origins of capitalism (Moore,

1967; Acemoglu & Robinson, 2012; Borras & Franco, 2012). Though land has attracted interest for a very long time, the scale of ongoing LSLD is unprecedented (Zoomers, 2010). It was the scale and speed of these changes in land ownership that caught the attention of media outlets. More recently, geographers and other social scientists have begun to draw attention to this financialization of nature in general and of land in particular (Vermeulen & Cotula 2010; Cotula, 2012; White *et al.*, 2012).

Identifying the drivers of investment has been the original focus of research on LSLD. Zoomers (2010) has identified seven primary drivers: i) Offshore farming by countries dependent on food imports to feed their population; ii) Investment in non-food agro-commodities and biofuels, and expectation of increasing land values; iii) Nature conservation and ecotourism; iv) Expansion of space for economic growth and its infrastructure (*e.g.*, Special Economic Zones); v) Growth of large-scale tourist complexes; vi) Increase in retirement or residential migration; and vii) Investment of remittances in land.

LSLD accounts for only a small proportion of recipient countries' arable land. However, the effects are not negligible because LSLD focuses on the best land for business, which means land with access to water, roads and markets, potential for irrigation, good quality soil and available productive infrastructure (Cotula, 2012). Moreover, available arable land in recipient countries decreases because of rising demographic pressure and non-food agriculture (mining, oil, tree plantations, bioenergy and tourism) (Cotula, 2012).

Access to land is an enabler of the land change process, which is then followed by changes in land use and cover, and modification in tenure systems, social relations and agrarian structure. Land use change in recipient countries starts abroad with land use displaced from the North to the South because of the former's consumption needs, while the South receives displaced land use (Weinzettel *et al.*, 2013). Land use displacement– because it increases food and forestry imports by affluent countries–partially explains the absence of association between economic development and biomass use (Weinzettel *et al.*, 2013). However, international trade not only reassociates land use and economic development but also gives rise to the concept of "land footprint" which is the land use needed to satisfy consumption (and not necessarily within the nation's borders) (Weinzettel *et al.*, 2013). Prior research on land use displacement has particularly focused on the dynamics of forest conversion (Uriarte *et al.*, 2010; Lambin & Meyfroidt, 2011). Recent use of the concept of "land footprint" shows that the United States (US), China and India together control 33% of the global land footprint. The US and the European Union's land footprints are 3.5 global ha/person and 2.5 gha/person, respectively, while the global average is 1.2 gha/person (Weinzettel *et al.,* 2013).

Large land footprints that satisfy consumption are only possible by enhancing land footprints for production, which requires economic capacity and available land, but does not necessarily require these two to be in the same country. Weinzettel *et al*. (2013) shows that doubling the income and availability of bioproductive land (per capita) increases the land footprint by 35% and 23%, respectively; land use displaced from rich to low-income countries through trade corresponds to 6% of the total global footprint and increases with income.

2. Methods

Data on land deals were obtained from the Land Matrix (Land Matrix, 2012). For some deals, the database indicated intended size and/or contract size and/or production size. When intended size and contract or production size were indicated, the latter two were used for calculations because they are more concrete. When information on the deal included only contract and production size, the larger size was used for calculation.

The links among LSLD, food and climate change were analyzed using the food score of the vulnerability to climate change index developed by ND-GAIN (Norte Dame Global Adaptation Index) (http:// index.gain.org/ranking/vulnerability/food) This score assesses the contribution of the food sector to the country's vulnerability to climate change. The food score takes into consideration a country's food production, nutrition and rural population. The indicators of vulnerability consider climate risk and adaptive capacity. It is expected that LSLD will increase climate risk since it encompasses the exposure and sensitivity aspects of vulnerability. Indicators of exposure are projected change in agricultural yield and variation in cereal crop yields. Sensitivity is addressed through rural population and food import dependency.

Data from the Land Matrix were used to describe trends and patterns of Japanese LSLD. The ND-GAIN index allowed assessing the linkages among LSLD, food and vulnerability to climate change. Thirteen countries were selected where deals for agriculture had taken place; the ND-GAIN index shows their position in the vulnerability ranking.

3. Results

Japanese investors have conducted 31 major land deals in 19 countries in all continents but Europe (Table 1). Data on the deals show, in many cases, the intended, contracted and production size. The intended size was indicated for 20 of the 31 deals; the total size of the intended deals was 744,598 ha. Contract sizes were declared for 14 deals, which totaled 246,052 ha. The total production size, stated for fifteen deals, was 197,012 ha. The means of right transfer were declared for 12 deals: six were lease/concession, five outright purchase, and one exploitation license. None of the purchases were in Africa, where land was only transferred temporarily through leases. The purchases were in South America (Brazil and Chile) and Asia (Vietnam).

An overall picture of Japanese investors' presence is

Table 1 Japanese land deals per country, continent and land use intention.

No.	Continent of investment	Target Country	Investor Country	Intention	Intended size	Contracted production	Production size	Crop
1	Africa	Angola	Japan	Agriculture	75000	-------	-------	Sugar cane
2		Egypt	Japan	Agriculture	2732	2732	-------	Potatoes
3		Kenya	Japan	Agriculture	100000	-------	-------	Jatropha
4		Liberia	Japan	Agriculture	48153	48153	--------	Rubber
5		Madagascar	Japan, Lao People's Democratic Republic	Forestry	15000	---------	--------	Acacia, Eucalyptus
6		South Africa	Japan	Forestry	11000	11000	--------	Eucalyptus
7	Asia	China	Japan	Agriculture, Industry	300	100	100	Fruit, vegetables
8		China	Japan	Forestry	6000	--------	6299	Eucalyptus
9		China	Japan, China	Forestry, Other	60000	----------	20997	Eucalyptus
10		Indonesia	Japan, Brazil	Agriculture	200000	----------		Sugar cane
11		Lao People's Democratic Republic	Japan, Lao People's Democratic Republic	Forestry	--------	50000	22434	Acacia, Eucalyptus
12		Malaysia	Japan, Malaysia	Agriculture, Industry	100000	--------	---------	Jatropha, Oil palm
13		Malaysia	Japan	Other	-------	----------	400	--------
14		Philippines	Japan, Philippines, China	Agriculture	11000	6000	----------	Sugar cane
15		Philippines	Japan	Agriculture	25000	--------	14000	Papaya, Banana, Pineapple
16		Philippines	Japan	Agriculture	10000	--------	--------	Jatropha
17		Thailand	Japan	Agriculture	40000	--------	--------	Oil palm
18		Thailand	Japan, Thailand	Agriculture	22500	--------	--------	Sunflower
19		Viet Nam	Japan, Viet Nam	Forestry	------	---------	46000	--------
20		Viet Nam	Japan, Viet Nam	Conserva-tion, Forestry	365	365	-------	Acacia
21		Viet Nam	Japan	Forestry	-------	--------	1550	Acacia
22	North America	Mexico	Japan, Australia, Netherlands	Renewable Energy	--------	1643	1643	--------
23	Oceania	Papua New Guinea	Japan	Agriculture	-------	1476	--------	Maize, Sugar cane, Cassava, Oil palm, Cacao
24	South America	Argentina	Japan	Agriculture	11000	--------	----------	Maize, Wheat, Soy beans
25		Brazil	Japan	Agriculture	-------	9864	7000	Maize, Soy beans
26		Brazil	Japan	Agriculture	-------	75075	40000	Cotton, Soy beans
27		Brazil	Japan	Agriculture	-------	9700	10000	Cotton, Maize, Soy beans
28		Brazil	Japan, Brazil	Agriculture	--------	22000	22000	Cotton, Soy beans
29		Chile	Japan	Forestry	3052	--------	2187	Eucalyptus
30		Chile	Japan	Forestry	3496	--------	2402	Eucalyptus, Pine
31		Colombia	Japan	Agriculture	-------	8000	-------	Oil palm

Source: Land Matrix (2012)

generated when the three sizes are added (Table 2). Moreover, the importance of Japanese investment in land at the national level is reflected by the percentage of each country's arable land taken by the deals (Table 2). In five countries the total land transferred in the deals was more than 1% of the arable land (Angola, Kenya, Lao Peoples' Democratic Republic, Liberia and Malaysia). In the case of Liberia, more than 10% of arable land is in hands of Japanese investors. In the remaining 14 countries, Japanese investment in land represents less than 1% of each country's arable land.

Though seven drivers of LSLD clearly refer to the expansion of capitalism through profitable businesses, this study shows that only non-food agri-commodities and biofuels are present in Japanese LSLD.

Agriculture is the dominant intention of these deals. Fifty-five percent of these land deals report agriculture as the intended land use (Fig. 1), and in most countries there is only one intention. However, there are some areas with diverse deal intentions. For instance, the deals in China are intended for agriculture, industry, forestry and other uses. There are also areas where agriculture is not the dominant intention, like Chile, Madagascar and South Africa wherein land deals are intended for forestry (Table 1).

Crops in these agriculture deals include food (maize, wheat, potatoes, cassava, papaya, bananas, pineapples and other fruits and vegetables) and non-food crops (sugar cane, soy beans, cotton, oil palm, jatropha, rubber, cacao and sun flowers). Interestingly, of the 19 deals for agriculture, only one (for fruits and vegetables) has a size amounting to merely hundreds of hectares (intended size: 300 but 100 in production). The other remaining 18 deals involve land transfers larger than one thousand hectares.

LSLD for agriculture took place in 13 countries. In the food indicator of the vulnerability index, five of these 13 countries are ranked below 130th (Angola 178th, Kenya 134th, Liberia 166th; Malaysia 131st, and Papua New Guinea 154th). In all of these countries it was indicated in the deals that non-food crops were going to be cultivated.

Forestry was the second most commonly declared

Table 2 Extent of LSLD and percent of arable land represented by LSLD per country in 2012.

Target Country	Total (ha)	Percent of arable land
Angola	75000	1.83
Argentina	11000	0.03
Brazil	116939	0.16
Chile	4589	0.35
China	27396	0.02
Colombia	8000	0.38
Egypt	2732	0.10
Indonesia	200000	0.85
Kenya	100000	1.82
Lao People's Democratic Republic	50000	3.57
Liberia	48153	10.70
Madagascar	15000	0.43
Malaysia	100400	5.58
Mexico	3286	0.01
Papua New Guinea	1476	0.49
Philippines	30000	0.56
South Africa	11000	0.09
Thailand	62500	0.40
Viet Nam	47859	0.74

Source: Land Matrix (2012)

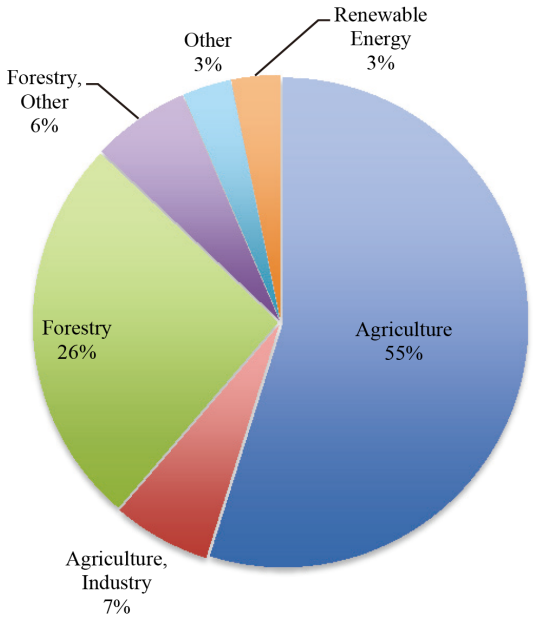

Fig. 1 Percentage of Japanese land deals per declared intention.
Source: Land Matrix (2012)

intention, accounting for 26% of the deals (Fig.1). A more detailed analysis shows that eucalyptus was the dominant species for intended forestry projects. It was the stated species in seven of ten forestry deals in South America, Asia and Africa, whereas acacia was present in Asia and Africa in four deals.

4. Discussion

The worldwide pattern of the North buying land in the Global South is confirmed by Japanese investment in land in Asia, Africa and South America. The declared intentions of the deals are diverse, though dominated by agriculture and forestry. Moreover, agricultural land deals have been made with the intention of producing food and non-food crops. The latter includes crops for energy generation, such as sugar cane and jatropha; industrial use, such as soy beans, cotton, oil palm and rubber; and consumption, such as sunflowers.

It would be easy to imagine that land use is displaced abroad because high-income countries often lack productive land. This is not the case, however. Rich countries, on average, have higher availability of bioproductive land per capita (3 gha/person) than low-income ones (1.6 gha/person) (Weinzettel *et al.*, 2013). Availability of domestic bioproductive land increases exports and land displacement by imports, while small rich countries import relatively more; thus displaced land footprints seem to increase with income (Weinzettel *et al.*, 2013). Since the case addressed in this paper is Japanese land investment, it is particularly relevant that high-population-density countries, industrialized European countries, South Korea and Japan exhibit the largest demand for foreign land (Weinzettel *et al.*, 2013).

LSLD may enhance countries' vulnerability to climate change. It is already established that food production is among the most sensitive sectors to climate change effects (IPCC, 2014). This may be exacerbated by LSLD because LSLD virtually always excludes local populations from the best, most fertile lands, which are transferred to foreign investors as part of the LSLD. Further, when these lands are used for cultivating food, it is for export, thus increasing local dependency on food imports, which in turn enlarges countries' vulnerability. However, often the lands are used for non-food crops, even in countries vulnerable to food insecurity. The use of land in food insecure countries for production of non-food crops is among the main reasons for resisting LSLD (De Schutter, 2011; Borras & Franco, 2012). Furthermore, the press has frequently pointed out the irony of producing crops to feed livestock or generate energy in countries where hunger is prevalent (UPI, 2012; Levitt, 2014).

The dominance of eucalyptus within forestry projects reinforces the wide propagation of this tree, which is native to Australia. Considering the documented debate about the impacts of introducing eucalyptus on farmland, including both its potential benefits for improving wasteland and degraded land and the potential negative effects of the massive introduction of an exotic species on the local biodiversity (Jagger & Pender, 2003), there is a need for regulation by countries that includes mandatory impact assessments and land zoning for forestry plantations. Further, it is unlikely that investment in forestry plantations will have soil quality recovery as a goal. Instead, generating profits is likely to be a primary goal; therefore, existing good soil and favorable productive conditions will be required in the lands that are purchased. This scenario illustrates potential tensions with local livelihoods and threats to food security.

Changing the use and cover of thousands of hectares of land has social and ecological consequences. For instance, land and water that previously was accessed and controlled by many people is transformed into land and

water that is controlled by a few powerful stakeholders (usually faceless corporations behind walls). This process also converts farmers into landless or agrarian workers. Furthermore, at the national level, revenues from the corporations reinforce the dependency of national economies on foreign investment, which also increases the power of foreigners and their lobbies over authorities in comparison to local populations.

The challenging transformations triggered by LSLD may require frameworks that include human-environment interactions across multiple temporal and spatial scales. Integration of the social and natural realms may be achieved using the social-ecological systems (SES) framework (Berkes & Folke, 2000; Ostrom, 2009). The SES framework emphasizes the interdependency of sub-social and sub-natural systems through flows of energy, services and labor (Liu *et al*., 2007; Chapin III *et al.*, 2009). The SES framework also allows for an investigation of how social and natural systems are integrated at the site. Further, the SES framework is particularly relevant because LSLDs trigger changes in the interactions between humans/social groups and the ecosystems locally, though LSLD are driven by non-local processes.

Social and ecological relations at the site level are influenced by dynamics at higher spatial levels. For instance, commodity prices may increase the need for land, while climatic changes may render certain areas less productive, therefore less suitable for investment. These dynamics necessitate analyzing how socio-environmental processes operate and have impacts at multiple levels. Using a perspective that includes cross-level analysis and combines land change science with political ecology (Turner & Robbins, 2008), is essential because, as this paper shows, Japanese LSLD triggers cascading multi-level socio-ecological transformations in the countries where land rights are transferred.

Of the seven drivers of LSLD presented by Zoomers (2010), non-food agri-commodities and biofuels are two of the important drivers of investment by Japanese LSLDs. It is also possible that offshore farming drives LSLD involving the production of maize, potatoes and wheat. Thus, the capital of Japanese investors has re-discovered land overseas to support profitable production of agro-commodities. These agro-commodities, though, are used for other industries or are incorporated into the global agro-food system. In doing so, the local populations of the recipient countries are disenfranchised and alienated from their means of production.

5. Concluding Remarks

Japanese land investments are causing social and ecological transformations where the deals take place. Changes in land tenure and use increase the vulnerability to climate change and worsen prior social, economic and political problems. LSLD will bring new crops and productive systems (more intense use of inputs) with effects on soils and water, which are still severely understudied. Moreover, countries increasing their dependency on the global economy enhance their vulnerability to fluctuations of food prices and international markets, while decreasing control over and access to their resources (*e.g.*, land) raises the probability of conflicts over resources. The complexity involved in LSLD reinforces the need to better understand this global process through an integrative perspective, a need that has been recognized for other global environmental challenges (Ostrom, 2007; Turner & Robbins, 2008). In this context, it is crucial to develop an approach that combines land use and land cover change with the social-ecological systems framework and is complemented with a political economical/ecological analysis of multi-level power relations streaming from LSLD.

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