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Economic and institutional determinants of foreign land acquisition in Africa: An empirical analysis, *Ayodele Odusola*

(Policy and MDG Advisor, UNDP Regional Bureau for Africa, New York)

Abstract

Over the past decade, Africa has experienced unprecedented demand for large scale agricultural land. Africa accounts for more than half of the volume of land acquired and close to two-thirds of the total deals globally. Yet, there is dearth of empirical evidence on demand for arable land in Africa. This paper provides some econometric analysis of the key determinants of large scale land acquisition in Africa. Evidences from bivariate and multi-variate analyses show that both economic and institutional factors play some critical role in explaining demand for large scale arable land in Africa. Key determinants include high yield gap, low per capita income, abundant inland water resources, low property rights and prevalence of corruption. To make the recent surge in land demand beneficial in terms of agricultural transformation, improved livelihoods for the rural people and reduce poverty, it is important to ensure both economic and institutional factors create positive incentives to the local economy, rural farmers and the poor. This includes making fertilizer available, increasing local farmers' access to agricultural infrastructures (e.g. irrigation, tractors and storage facilities), investing in land registration and certification, and improving land governance and procedures.

Introduction

Foreign land acquisition in Africa is receiving an increasing attention among policymakers, the public and media. This is due to the unprecedentedly rising wave and intensity of agricultural land investment over the past decade. For instance, as at 2012, out of the 1,217 publicly reported deals, 62 per cent took place in the continent. This translates to 56.2 million hectares for Africa, 17.7 million for Asia and 7 million hectares for Latin America. This corresponds to 4.8 percent of Africa's total agricultural areas compared to 1.1 per cent and 1.2 percent for Asia and Latin America respectively. The volume of foreign land acquired in Africa is almost equivalent to landmass of Madagascar or Kenya or Botswana. Out of 11 countries accounting for 70 percent of the targeted lands, 7 are from Africa. Besides, out of 32 countries (each with more than 3 million ha of arable land available) that account for more than 90 per cent of available land - 16 are from Africa, 8 in Latin America, 3 in Eastern Europe and Central Asia, and 5 in the rest of the worldⁱ.

The unequal global distribution of arable land plays an important role in shaping this trend. While possibility of agricultural land expansion is very limited in developed countries, about 90 percent of the remaining 1.8 billion ha of arable land is in developing countries – mostly in Sub-Saharan Africa and Latin America. Particularly, 60 per cent of arable land remains unused in Africa. In contrast, regions such as South Asia and Near East and North Africa have virtually run out of arable land and it is rare in developed regions.

Several factors account for the surge in African land from both foreign and domestic dimensions. Economic, institutional and political stakes are at play. From the external side, the recent recurring food and fuel price hikes are important drivers. To address this, countries want to reduce import cost of food and fuel and ensure future security of these commodities. Outsourcing of food and fuel production has become an important investment policy and national food strategy in many developed and emerging economies facing serious challenges in expanding their arable land and the associated water requirement. The growing reserves of some sovereign wealth funds make speculative investment in land rife while other use land as an alternative investment to avoid the global financial crisis. From the African side, abundant under-utilized arable land and water resources for irrigation, low input cost, low productivity, unclear land titles, and weak governance and related institutional challenges are key factors making land grab very attractive in the continent. A few of the countries have large arable land resources which cannot be utilized because of size relative to what is needed, production capacity and financial constraints to provide the needed agricultural infrastructure and services.

The rising trend and intensity of large scale land acquisition in Africa has been well documented. Most of the discussion has been based on qualitative analysis. However, there has been limited quantitative analysis of the determinants of land deal in Africa. The knowledge about the socio-economic and institutional determinants of land grabs in Africa is scanty and is not yet fully understood. This paper aims at bridging this knowledge gap by providing greater clarity on the factors driving large scale land investment in Africa. To achieve the objective, the paper has been structured into five parts. Following the introduction is section two that examines the overview of large scale land acquisition in Africa. Some reflections on economic and institutional determinants of land grab are examined in part three while section four delves into modeling economic and institutional determinants of land grab demand and analysis of results. Section five concludes the paper.

2. Overview of land grab in Africa

Over the last four decades, land area used for agricultural production has been rising globally. For instance, the global area used for crops increased by 187 million ha between 1967 and 2005. The increase occurred mainly in developing countries (227 million ha) while it decreased by 40 million ha in developed countries. The decrease in developed countries was as result of the continuous growth of yields and the deceleration of agricultural commodity demand (Gorgen *et al*, 2009). The recent food crisis and growing demand for biofuel appear to have changed the trend of demand for agricultural products in the past decade.

A quick review of the existing literature on this issue confirms the unprecedented volume and intensity of land acquisition in Africa. For instance, Friis and Reenberg (2010) provide a snapshot of the media reports on Africa over the period 2008–2010 and conclude that between 51 and 63 million hectares (ha) were involved in land acquisition in the continent. The documentation by Deininger *et al* (2011) over 2008 and 2009 puts the global acquisition at about 56.6 million ha with about 40 million ha in Africaⁱⁱ. The findings from Oxfam (2011) using a combination of media and triangulation sources put it 227 million ha globally over the period 2001–2010 - about 67 million ha have been cross-checked with respective governments and other actors. Several factors explain the differences in figures, including time of coverage, method of inventory and level of coverage.ⁱⁱⁱ As articulated in Odusola (2012), irrespective of the various methods used by the numerous authors for such countries as Ethiopia, Madagascar and Mozambique, the media figures are substantially higher than the research-based values. This, however, does not invalidate the intensity of land grab in the continent.

Evidence from Land Matrix Database^{iv}, which has gone through error-checking process of triangulation and covers 200 million ha with 2,200 deals between 2000 and early 2012, provides some illumination on the issue. Unlike most other sources that do not consider any deal less than 1000 hectares, this covers 200 hectares and above per deal. An important aspect of land deal is land concentration - the size of single land acquisitions approved to individual investor. Based on the five countries studies by Cotula *et al* (2009), it ranges from 452,000 ha in Madagascar to 100,000 ha in Mali (Table 1). Cotula (2012) also reveals that the average sizes of projects above 1,000 ha are much smaller than what is suggested by media reports. Contrary to a mean ranging between 111,000 ha and 135,000 ha for Ethiopia and of about 186,000 ha for Mali from the media reports, the research based findings put it at 7,500 ha for Ethiopia^v and 22,000 ha for Mali. Evidence from the top targeted countries also reveals that the average land deal ranges from 40,951 ha in India to 217,968 ha (Sudan), 252,601 ha (Zambia) and 805,187 ha (DRC) (Anseeuw, *et al*, 2012). Other countries with high average land deals include Indonesia and Malaysia.

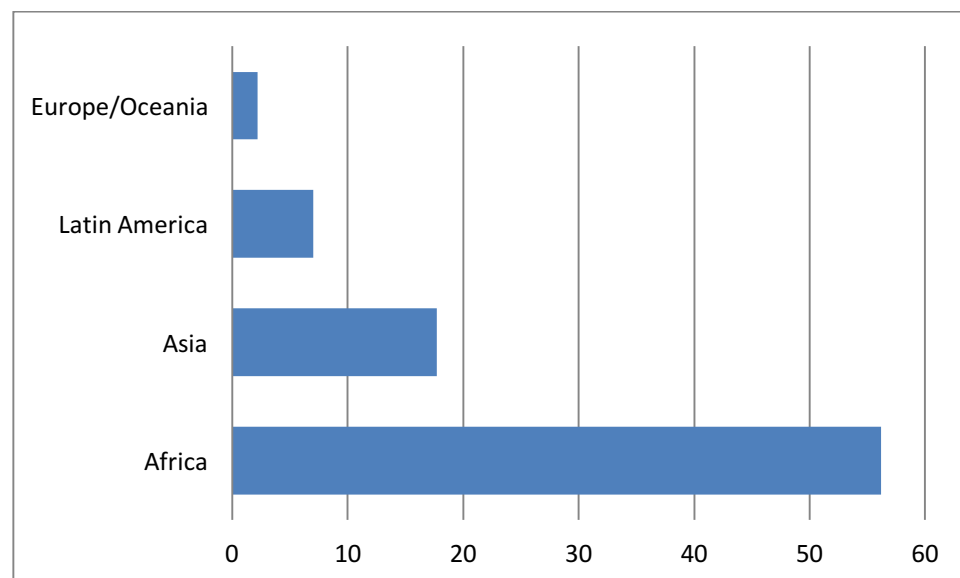
The rising trend of land acquisition at the provincial levels (e.g. Mozambique and Ethiopia) is another issue. The number of approved land leases in Manica Province of Mozambique alone rose from just

562 ha in 2007 to 21,334 ha in 2008, 58,880 ha in 2009 and by January 2010 applications for 367,165 ha were pending (Cotula, 2012). Land, being the major asset of rural dwellers and core of their livelihoods, calls for caution for this phenomenon not to lead to intense vulnerability, poverty and inequality.

When land acquisition for only agriculture is considered, a similar trend is also observed. For instance, the evidence from above is further supported by the finding from Anseeuw *et al* (2012) which concludes that Africa appears to be the main target of the land rush because of the 1,217 publicly reported deals, 62 percent of the projects took place in the continent. This translates to 56.2 million hectares for Africa, 17.7 million for Asia and 7 million hectares for Latin America (Figure 1). It represents 4.8 percent of Africa's total agricultural areas compared to 1.2 percent and 1.1 percent for Latin America and Asia respectively (Anseeuw *et al*, 2012).

Odusola (2014 a) provides a detailed analysis of the relative share of land grab to each of the African countries. For instance, he posits that this corresponds to about a quarter of DRC landmass or almost the size of Botswana or Kenya or Madagascar landmass. It is twice the size of Burkina Faso, ten times that of Togo and twenty times that of Guinea Bissau or Equatorial Guinea. Interestingly, the size of land acquisition between 2008 and 2010 is almost equivalent of the combined size of some 18 African countries in terms of surface land area.^{vi}

Figure 1: Regional distribution of acquired agricultural land (2000- early 2012) in million hectares

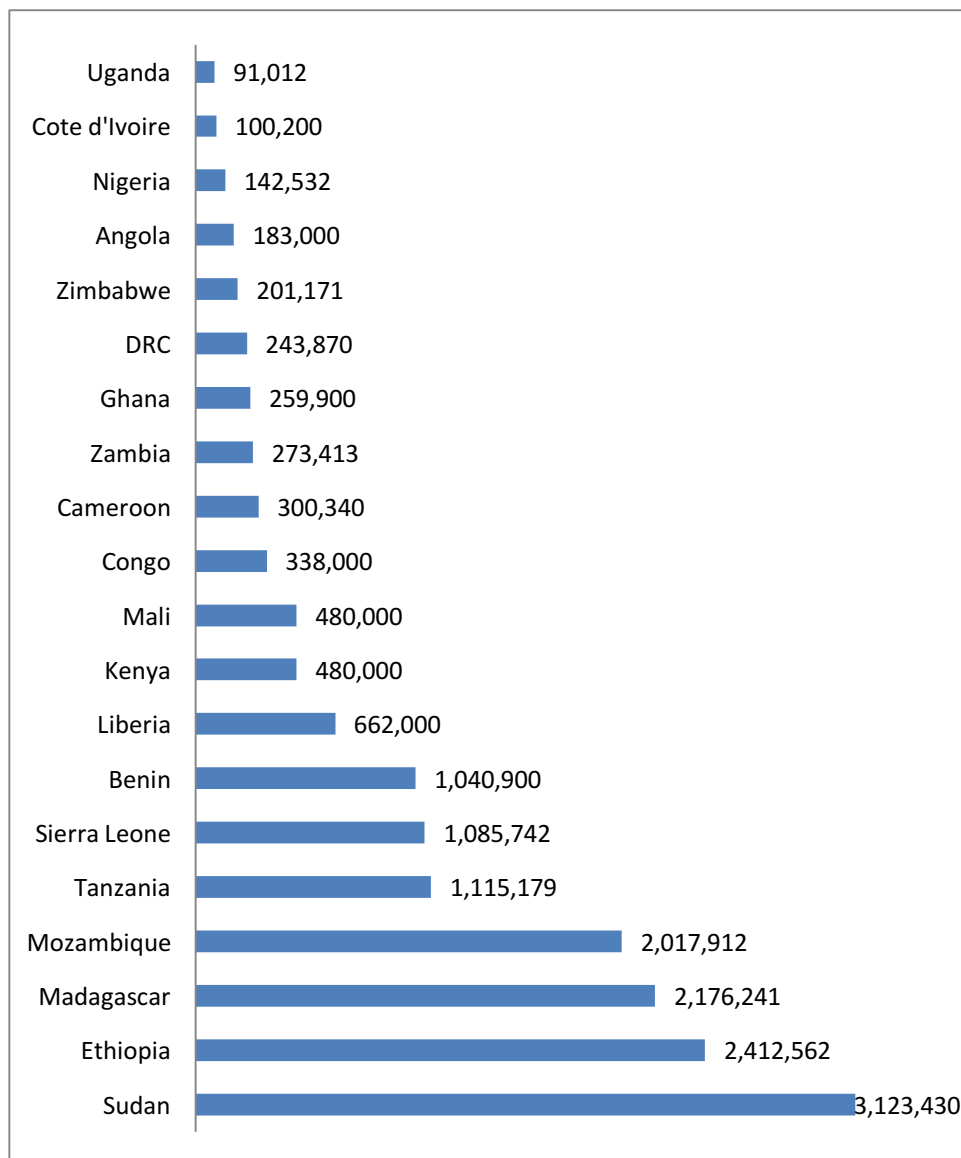


By Source: Compiled and computed the author from Anseeuw *et al* (2012).

Although a large number of countries (84) are targeted by foreign investors for agricultural purposes, only 11 of them account for 70 percent of the targeted surface. Among the 11, countries 7 are from African (Sudan, Mozambique, Tanzania, Ethiopia, Madagascar, Zambia and DRC)^{vii}. The lands of these African countries, among others, are in hot demand and therefore experienced largest pressures both in terms of volume of hectares and number of deals. Figure 2 provides a graphical view of the most targeted twenty countries in Africa. Countries where over one million hectares of land had been acquired are Sudan, Ethiopia, Madagascar, Mozambique, Tanzania, Sierra Leone and Benin.

Several factors explain the intensity of land grab in Africa. The most important factor is availability of unused arable land. Based on estimation from Fischer *et al* (2002), out of 2.8 billion ha potential arable land in developing countries, only 970 million ha was being utilized. The literature is replete with the evidence that South America and Sub-Saharan Africa account for 90 per cent of the potential available land for crop production globally with seven countries (Brazil, Democratic Republic of the Congo, Angola, Sudan, Argentina, Colombia and Bolivia) accounting for 50 per cent of the potential arable land, which is estimated to be 1.8 billion ha (Gorgen *et al*, 2009). Given the concentration of the un-utilized arable land in these two regions, the urge for food and fuel security, with associated price incentives for agricultural commodities, could play an important role in the rising demand for land in Africa.

Figure 2: Most targeted twenty African countries as at 2012



Source: Author's computation and compilation from Anseeuw *et al* (2012).

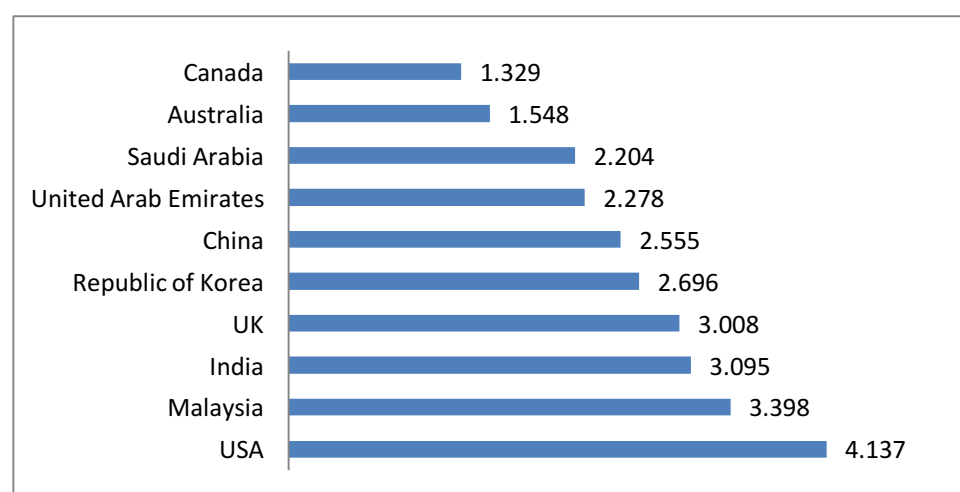
Analysis of the top ten land acquirers (including food production, agri-fuel production, mineral extraction, conservation and tourism) reveals USA, Malaysia, India and UK as the largest acquirers (Figure 3). About **10 percent** of investors account for **68 percent** of the acquired lands (Land Matrix, 2012). However, when only agricultural land is considered, the role of China became more pronounced as the lead actor. Countries such as USA, UK, Malaysia, South Korea, Saudi Arabia, Sweden, South Africa, Qatar, Norway and Singapore are among the leading thirteen acquiring nations (Anseeuw *et al*, 2012). While the dominance of the North still hold sways, the role of emerging countries are becoming more entrenched especially some of the BRICS countries (China, India and South Africa). This, to a large extent, confirms the pronounced agitation about the dominance of China and the Gulf State (especially Saudi Arabia and Qatar) in formal land acquisition in Africa.

An important feature of land grab is the heterogeneity of investors, which if well managed could be an opportunity for the continent. A copious review of the Land Matrix data brings to the fore four different types of investors, namely, private companies, public or state owned enterprises; investment funds and private-public partnerships. Private companies are dominant with 442 deals and 30.3 million ha – representing two-thirds of the cumulative land acquired. The state-owned agencies comprise 172 deals and 11.5 million ha – representing a quarter of the affected land. Investment funds have 32 deals and 3.3 ha while the private-public partnerships record 12 deals and 0.6 million ha. Analysis from Anseeuw *et al* (2012) reveals that investors from North America, Europe, Asia and the Gulf States are almost exclusively private companies.

Perhaps due to the heated debate about land grab globally, large scale land acquisition is taking a new dimension. For instance, two African countries have emerged as strategic transit countries - South Africa and Mauritius (IIED, 2012). Foreign investors are leveraging South Africa's proximity, knowledge and experience in African agriculture and commercial farming. Many South African companies have facilitated commercial farming on behalf of foreign investors (e.g. those with UK origin; partnership with Chinese origin is emerging) in countries such as Mozambique, Swaziland, Malawi, Tanzania and Zambia. As a result of good tax system and the existence of several bilateral investment treaties with many African countries which could protect foreigners' investments, some foreign investors (especially from Australian, UK and Singaporean origins)^{viii} prefer to reach out to other countries through Mauritius.

Most databases and studies focus on direct land acquisition for greenfield investments with limited attention on activities such as taking over the management of existing farms previously or currently run by government establishments; including rehabilitation of existing irrigation and related infrastructure as well as equity participation in existing agribusinesses. Richardson (2010) reviews the strategy of a South African sugar company in the takeover of many existing ventures and equity participation in a number of Southern African countries over the past two decades. In addition, many foreign investors now operate through nationally incorporated subsidiaries – a phenomenon that blurs the borderline between national and foreign investments.

Figure 3: Top 10 land acquirers (2000-April 2012) by million hectares



Source: Author's computation and compilation from Anseeuw *et al* (2012).

Table 1: Approved land for investors' claim (2004 to early 2009)

	Ethiopia	Ghana	Madagascar	Mali	Sudan	Total
Total Land allocated (ha)	602,760*	452,000*	803,414*	162,850*	471,660*	2,492,684*
No of projects approved (over 1000 ha)	157	3*	6*	7*	11*	184*
Largest land allocation (ha)	150,000	400,000	452,000	100,000	109,200	
Total investment commitments (US\$)	78,563,023*	30,000,000*	79,829,524*	291,988,688*	439,600,000*	919,981,235*

Source: Cotula, Vermeulen, Leonard and Keeley (2009).

Note: * indicates incomplete data.

Large-scale lands acquired are used for multidimensional purposes. Of the projects with commodity data, 37 percent focus on food crops, 21 percent on industrial or cash crops, and 21 percent on biofuels, with the rest distributed among conservation or game reserves, livestock, and plantation forestry. The scale of investors' ambition is huge, with a median project size of 40,000 ha (Deininger, 2011). It is important to note that foreign investors target land with high yield gaps, good accessibility and considerable population densities. Other drivers, from the African side, which will be discussed in the subsequent section of this paper, are access to water and some institutional factors such as property rights.

From the acquirers' side, important factors boosting demand for large scale land acquisition include a shortage of fertile land due to unfavourable climate conditions or population growth on the one hand and sufficient financial status of land acquirers. Good examples of countries with substantial land deals are Saudi Arabia, Qatar, UAE (Gulf States) and China, South Korea, and India (Asia). In the analysis of Europe's global land demand, Lugschitz, *et al* (2011) explain that Europe's lifestyle is dependent on how foreign land resources can be assessed for outsourcing of production processes. It concludes that land demand is a function of countries' high level of consumption (e.g. the EU-15, Russia and CIS, and USA) and countries with elevated population (e.g. China and India). The authors conclude that outsourcing agricultural production (or demand for foreign land) is pronounced in countries with very low land productivity dominated by grassy landscapes and savannahs which are often being farmed very extensively (e.g. USA, EU-27, Japan, China and India). In addition to the price incentives associated with outsourcing of production in the context of rising prices of agricultural commodities, there is also the demand for natural resources especially in Sub-Saharan Africa, Latin America and the Caribbean (Gorgen *et al*, 2009).

3. Some reflections on economic and institutional determinants of land grab in Africa

The demand for land is a derived one. People demand for land for what comes from it in terms of food, raw materials for industrial production and residential needs. To some extent, it is held as a portfolio asset and also to hedge against inflation. As these needs become intense, the demand for land also builds up. For instance, the recent recurring food price hikes are a manifestation of an excess demand for food over its supply. The world population is expected to rise from 7.2 billion in 2013 by 1.0 billion over the next 12 years and reach 9.6 billion by 2050 (UN, 2013). If the current consumption pattern of industrialized countries is maintained, the 9.6 billion people in 2050 will be consuming at the rate of 12.0 billion people (IFPRI *et al*, 2012, p.3) – a phenomenon that will lead to a substantial rise in the demand for food. The food and nutritional requirements of the world population have been projected by FAO to raise global current food production by 70 per cent and that of the developing countries by 100 per cent (Bruinsma, 2009).

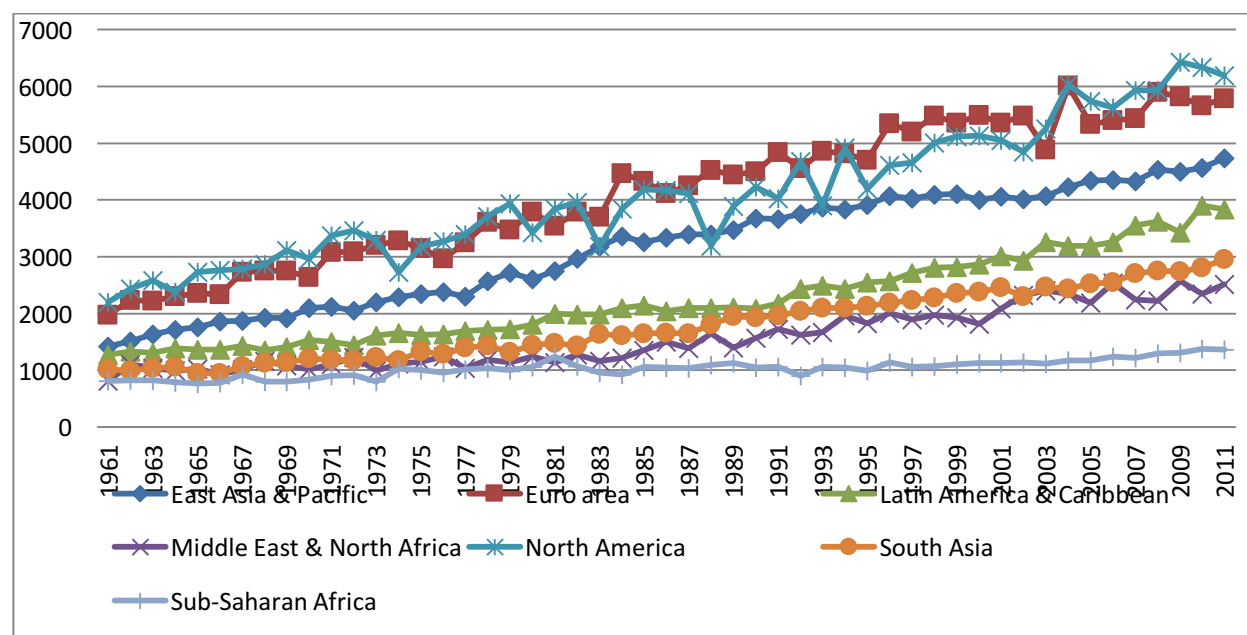
The use of land intensification of land use, through biotechnology, which has enhanced agricultural yields over the past decades have started to lose ground to public opposition to genetically modified food production. The growing use of biofuel as a substitute to fossil fuel has also added industrial demand in agricultural markets. Woodhouse and Ganho (2011) explain the rising demand for foreign land to be driven by the rising insecurity of energy and food supply and concomitant volatility in energy and food commodity prices. FAO (2009) sees the combination of environmental and security concerns which have diverted agricultural outputs from food to biofuel production as the principal driving force for land acquisition in Africa. Meeting the food security concern is an important factor in explaining land demand in foreign countries. For instance, the Saudi Arabia's 'Agro Globe 7x7' scheme which is targeting 7 million tons of rice in Africa has designated 70 per cent of the products for export to the investing country (GRAIN, 2010).

Some other economic factors play significant role in the demand for agricultural land. A decomposition of the global growth in crop production between 1961 and 2005 shows yield growth and crop intensification outweigh arable land expansion. For instance, the decomposition reveals that 77 per cent of the growth came from yield growth, 9 per cent from crop intensification, and 14 per cent from the expansion of arable land area (Bruinsma, 2009). Over this period in Sub-Sahara Africa, crop yield accounted for 38 percent of output growth and this is expected to rise to 69 per cent in the future. Licker *et al* (2010) also finds that although yield gap varies considerably by crops: yield gap for maize (63 percent), rice (65 percent) and wheat (52 percent), it is extremely larger in Africa relative to North America (15 percent, 12 percent and 39 percent) and Western Europe (32 percent, 24 percent and 12 percent). Countries pushing for agricultural outsourcing are therefore competing to take advantage of this yield gap in Africa.

Deininger and Byerlee (2011) also provide some illumination on the role of yield gaps in the establishment of large farms in land abundant countries. Of all the sub-regions of the world, only Oceania is close to realizing its potential, followed closely by North America (0.89), Europe (0.81), and South America (0.65). Sub-Saharan Africa, however, is quite far from its potential – it realizes only 20 percent of potential yields. The authors also examined the non-forested uncultivated area suitable for rain fed cultivation and found 446, 306 and 198 million ha for population density cut-offs of 25, 10, and 5 persons per km² respectively. The total non-cultivated area suitable for rain fed cultivation is highest in Africa (202, 128, and 68 million ha) corresponding to 45, 42, and 34 percent of the total, respectively. This is followed by Latin America. Also of the 32 countries (each with more than 3 million ha of arable land available) that account for more than 90 per cent of total global available land, 50 per cent are from Africa. Only 25 per cent is from Latin America, 9.4 per cent from Eastern Europe and Central Asia, and 15.3 per cent from the rest of the world. Availability of yield gap and uncultivated arable land is one of the drivers of foreign demand for agricultural land in Africa. Nkonya *et al* (2012) also emphasize land suitability for foreign countries' crops of interest and specie abundance as one of the significant factors for land demand. The findings from Arezki *et al* (2011), using gravity a model, also underscore the role of agro-ecological suitability in explaining both demand and actual implementation of land deals.

Figure 4 provides additional insight into the yield gap. In spite of abundant fertile arable land, Sub-Saharan Africa recorded the least cereal yield across all the regions. This is a clear indication of very high yield gap in Sub-Sahara Africa relative to other regions. Regions with large yield gaps often experience substantial pressures for land demand. This, to a large extent, explains the unprecedented demand for the continent's land from foreign investors.

Figure 4: Cereal yield (kg per hectare) across world regions, 1961-2011



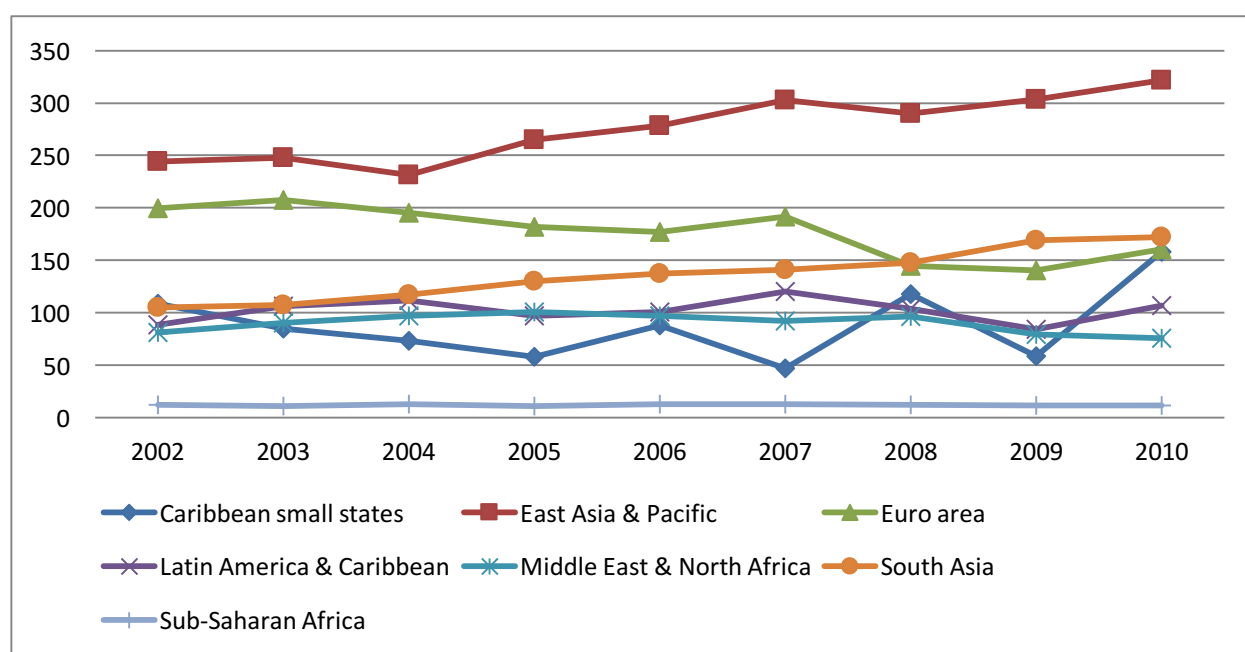
Source: Author's computation from <http://data.worldbank.org/indicator/AG.YLD.CREL.KG> [Accessed, July 2013].

Fertilizer is an important input into yield expansion by adding to soil nutrients, which have been a limiting factor over the years. In spite of the importance of fertilizer consumption in agricultural yield, many regions of the world still consume very low rate of it. As pointed by Potter *et al* (2010), more than 50 percent of global cropland applied just 2.5kg per ha while only 8.5 per cent applied fertilizer in excess of 36 kg per ha. Many countries with arable land limitation are therefore looking for countries with low fertilizer consumption for large scale land acquisition with a view to taking advantage of land and crop intensification. As opposed to the astronomical improvement in East Asia and the Pacific, fertilizer consumption is extremely low in Sub-Saharan Africa and Latin America and the Caribbean (Figure 5). While rate of fertilizer application has been rising in other regions of the world especially since 2008, it actually declined in these two regions. This could contribute to why foreign pressure on Sub-Saharan Africa and Latin American lands has been intense in recent times. This is premised on the assumption that enhanced fertilizer utilization will bring about rapid productivity improvement.

Water is an essential input for agricultural production as availability of adequate moisture is an important requirement of agricultural use of land productivity. As argued by Hertel (2010), the rapidly diminishing rate of water availability in many parts of the world coupled with increasing wave of soils degradation are putting more pressure on land demand for agricultural production. Water is therefore an important economic determinant of foreign land acquisition. Water and irrigation facility availability constitutes an important factor in land demand. Mann and Smaller (2010) and Cotula (2011) consider virtual demand for water as the critical element of land deal in recent times. The negotiation between a Libyan company (Malibya) and the Government of Mali on priority water allocation to the company's farm during off season, when water supply is low from river Niger (GRAIN, 2009), is an important example of the centrality of water in land deal.

Countries with large volume of water for agriculture, mostly not fully utilized, are often the target for large scale land acquisition. Bruinsma (2009), Neumann *et al* (2010) and Hertel (2010) have argued that absence of irrigation is a major impediment to wheat, maize and rice potential yields in many countries. As shown by UNDP (2006) and Neumann *et al* (2010) agriculture alone accounts for between 70 and 80 percent of water withdrawals in less industrialized countries. Evidence from Bruinsma (2009) also observes that pressure on water resources is highest in Near East and North Africa and lowest in Sub-Saharan Africa and Latin America. A juxtaposition of topmost land acquirers and targeted countries, as indicated in Figure 6, reveals most acquirers (India, China, USA, Egypt, Brazil and Canada) are under pressure of water withdrawer as opposed to the targeted countries such as Benin, Liberia, Sierra Leone, DRC, Mozambique and Burkina Faso. While water pressure from India, China and USA was over 470 billion cubic meters, it was less than 1 billion cubic meters in most targeted countries listed above – see figure 6. Incidentally, few countries with medium size water withdrawal (e.g. Sudan and Madagascar) are among the heavily targeted. This could suggest the rising impact of land deals on water in these countries. The low level of water withdrawal in many Africa countries explains the rising wave for land demand from countries experiencing high water pressure. An interesting part of demand for land in Africa is the water paradox.

Figure 5: Fertilizer consumption (kilograms per hectare of arable land), 2002-2010



Source: Author's computation from <http://data.worldbank.org/indicator/AG.YLD.CREL.KG> [Accessed, July 2013].

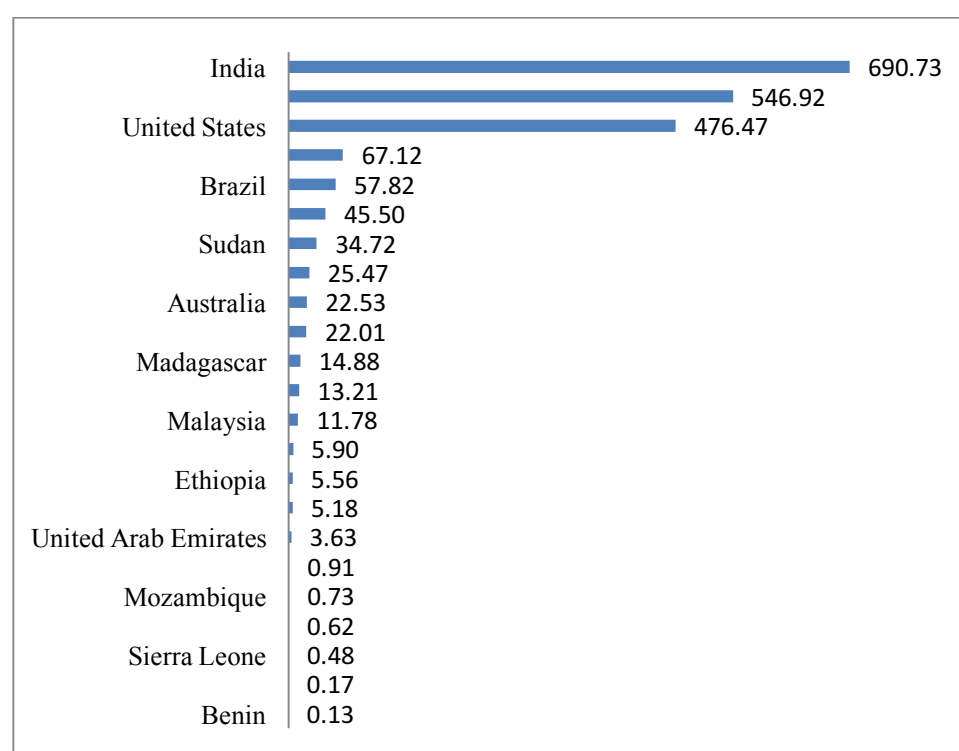
While the current pressure on water is higher in Sudan and Madagascar than those of such land acquirers as Saudi Arabia, United Kingdom, Malaysia and UAE, the future water requirement of food security in the later latter countries is making them to pass the burden to the former (Sudan and Madagascar). This could weaken most African countries' capacity to make water available for non-agricultural use especially for domestic consumption – a development that could make water more expensive in the future. Woodhouse and Ganho (2011) provide some useful examples from the Sahel. They point out that in spite of the commercial desirability of irrigation in the region (e.g. Senegal and Mali), past and present foreign investments in agriculture have been focused on the major river floodplains and the production of crops with higher water requirements. They therefore conclude that the impact on water use may constitute a significant 'hidden agenda' of foreign land acquisition. The relatively high level of under-utilization of irrigation infrastructure in most African countries (73 percent utilized in Senegal, 43 per cent in Sudan and 11 per cent in Congo (FAO, 2005)) makes the continent a primary target for agricultural land¹. However, the lack of regular maintenance and low operational budget account for low utilization of irrigation infrastructure in many sub-Saharan African countries.

The structural adjustment programmes embarked upon in the early 1980s and further consolidated in the 1990s is also another factor for turning agricultural facilities and investment previously managed by public institutions into commercial ventures. The urge to reduce government budget

¹Few countries were able to record more than 100 percent utilization. For instance, Mali was able to achieve 171 percent due to crop intensity – the irrigated areas were not only fully harvested but were also able to cultivate multiple crops per year.

deficit through privatization and foreign direct investment in many African countries led to foreign acquisition of rich agricultural lands including irrigation facilities. As part of the market-based 1984 Agricultural Policy of Senegal, the existing irrigation facilities (including Manantali and Diama dams) were transferred to farmers associations while new investments were to come from commercial investors. The rising cost of production (including removal of fertilizer subsidy) associated with the market-based strategy in the Sahel (Woodhouse and Ganho, 2011) and the rising water fees (Aw and Diemer, 2005) especially for the farmers cultivating on the Office du Niger, are important causes of under-utilization of irrigation facilities. The investment proclamations and regulations of 2002, 2003 and 2008 in Ethiopia provided for tax exceptions and export facilitations also created incentives for foreign investments (IS Academie, 2012).

Figure 6: Water withdrawal (billion cubic meters) from topmost land acquirers and targeted countries, 1997-2011



Source: Author's computation from <http://data.worldbank.org/indicator/ER.H2O.FWTL.K3/countries> [Accessed, July 2013].

The African government divestment in agricultural infrastructure was also influenced by declining multilateral lending to agriculture. Official development assistance to agriculture declined from 15 per cent in the 1970s to about 5 per cent in 2007 (GTZ, 2009) while the World Bank loan to this sector declined from 30 per cent in 1980 to 7 percent in 2000 but rose to 12 percent in 2010 due to the need to proactively address the recurring food price hike (IPS, 2013). A similar institutional change, which accelerated land-use and land cover change as well as shifting the land-use in the new mode, was experienced in Eastern Europe after the collapse of socialism and the transition from

state-command to market-driven economies in the early 1990s. This development has been linked to land use and abandonment in several Eastern Europe countries (Prishchepov *et al*, 2011).

Urbanization Evidence from several studies reveals that demand for land is more intense in countries with very weak former land rights (Cotula, 2011). Results from Deininger (2011) show a high likelihood of a country with weak institutional arrangement for land management being subjected to intense land demand by foreign investors. Several institutional issues have also been raised on land deals. The emphasis placed on large scale land acquisition in Africa, for instance, constitutes a major change in international economic relationships. Anecdotal evidence from several authors, including World Bank (2009) and World Bank *et al* (2009) reveal that heavy agricultural land investment is happening in many African countries where regulatory and legal frameworks are ill-equipped to defend the interests of existing land users or the wider public interest. Most of the targeted countries are characterized by weak regulations, absence of property rights and limited land titling. In most African countries, especially rural areas, land rights are insecure. There are ambiguities within and between the customary and statutory systems, partly due to inaccurate and incomplete records (Garvelink, 2012). The weak, confusing and contradictory formal and customary laws provide opportunities for the elite, especially those with financial standing and people with political connections, to acquire land held by rural and indigenous people without any protection. In most countries, agreements for large scale land acquisition are not fair and regulatory frameworks are always not in place to prevent negative externalities, provide benefits to land owners and local communities in a way that safeguard people's livelihoods (Odusola, 2012, 2014a and b).

Property rights index is quite low in Africa. When countries are ranked between 1 and 100 points, only three African countries scored 70 points (Mauritius, Cape Verde and Botswana). Another three scored 50 points (South Africa, Seychelles and Ghana). Furthermore, nine countries scored between 35 and 40 points (e.g. Senegal, Malawi and Madagascar) while 22 countries recorded between 20 and 30 points (e.g. Benin, Burkina Faso and Ethiopia). Thirteen countries scored between 10 and 20 points – categorized as very low scores (Table 2). Particularly, countries such as DRC, Congo, Eritrea, Sierra Leone, and Zimbabwe scored 10 points. Interestingly, of the thirteen most targeted African countries on land deals only one of them had 40 points while others scored between 10 and 30 points². Also out of 24 countries whose property rights scores declined between 2012 and 2013, almost all the targeted countries are included – excepting Mali, Liberia and Zambia (which all belong to the low scores category). In fact, highly targeted countries such as Ethiopia and Mozambique are among those with highest rate of decline in property rights. As indicated in Table 2, none of the highly targeted countries is among those with high property rights index.

How does rapid urbanization and conversion of peri urban/rural land impact on this subject?

²Sudan, the mostly sought after country, did not have data for property rights in the 2013 index of Economic Freedom.

Arising from growing debates on land administration in Africa, some progress has been recorded in recent times. This includes decentralizing land management and rationalizing customary and statutory laws in such countries as Burkina Faso, Kenya, Malawi, Mozambique, Rwanda, and Zambia; establishment of Customary Land Secretariats that trained people in land record keeping and dispute resolution (e.g. Ghana); and creation of regional and community land management administrations (e.g. Tanzania and Uganda) (Garvelink, 2012). This also includes the innovative local approach to land registration and certification in Ethiopia which has culminated into over 15 million households holding land titles between 1995 and 2012 (IS Academie, 2012). It is expected that this will enhance rural people benefit in large scale land acquisition in these countries.

Ordinarily, the law provides the foundation for rights and accountability. In several countries, however, laws legitimize abuses of power against the powerless. In the case of effective land laws, legal frameworks provide some opportunities to protect the land rights of people (especially the rural dwellers) and for holding decision-makers to account for land they administer. As argued by Polack *et al* (2013), when land becomes of interest to commercial investors, the legal options available to local groups are few and the effectiveness of public accountability framework becomes compromised. In many African countries, most governments arrogate the right to allocate land to rich individuals or business entities, often with minimal or no consultation with land users, and with meager or no compensation to rural people. Using the indicators of political space as a measure of accountability, Ghana provides a sharp contrast of Ethiopia (a targeted country) in terms of freedom of association, participation and human rights and press freedom. Madagascar, another targeted country, was rated very low on participation and human rights as well as freedom of association. Cameroon and Mozambique are also low on freedom of association while Uganda was rated low on freedom of the press.

Accountability is not only in the formal setting. Weak accountability on the part of traditional landlords in DRC is an important institutional factor. The local land tenure system where local chiefs arrogate substantial power to themselves and behave as landlords rather being trustees complicates the already weak public institutions^{ix}. Weak transparent and accountability framework is are attracting large scale investors to most targeted African countries.

Ambiguity in land ownership is another issue. For instance, in Madagascar, foreigners are not allowed to own land but they could have access to land via a company, which has the right to lease the purchased land. The legal situation about foreign ownership of land is not clearly defined (Gorgen *et al*, 2009). Other institutional considerations in land demand in developing countries with low world market integration include limited information about land market, unclear land titles, weak governance and high prevalence of corrupt practices.

Table 2: Level and change in property rights among African countries, 2012 and 2013

Countries with low property rights index			Countries with medium property rights index			Countries with high property rights index		
Countries	Property rights index (2013)	Change in property rights index from 2012	Countries	Property rights index (2013)	Change in property rights index from 2012	Countries	Property rights index (2013)	Change in property rights index from 2012
DRC	10	-1.5	Algeria	30	-1.4	Ghana	50	0.6
Congo, Republic.	10	-0.3	Benin	30	1.9	Seychelles	50	1.9
Eritrea	10	0.1	Burkina Faso	30	-0.7	South Africa	50	-0.9
Sierra Leone	10	-0.8	Cameroon	30	0.5	Botswana	70	1
Zimbabwe	10	2.3	Comoros	30	1.8	Cape Verde	70	0.2
Angola	15	0.6	Djibouti	30	0	Mauritius	70	-0.1
Equatorial Guinea	15	-0.5	Ethiopia	30	-2.6			
Burundi	20	0.9	Gambia, The	30	0			
CAR	20	0.1	Kenya	30	-1.6			
Chad	20	0.4	Liberia	30	0.7			
Guinea	20	0.4	Mali	30	0.6			
Guinea-Bissau	20	1	Mozambique	30	-2.1			
STP	20	-2.2	Namibia	30	-1.6			
Cote d'Ivoire	25	-0.2	Niger	30	-0.4			
Mauritania	25	-0.7	Nigeria	30	-1.2			
			Rwanda	30	-0.8			
			Tanzania	30	0.9			
			Togo	30	0.5			
			Uganda	30	-0.8			
			Zambia	30	0.4			
			Egypt	35	-3.1			
			Gabon	40	1.4			
			Lesotho	40	1.3			
			Madagascar	40	-0.4			
			Malawi	40	-1.1			
			Morocco	40	-0.6			
			Senegal	40	0.1			

			Swaziland	40	0			
			Tunisia	40	-1.6			

Note: DRC is Democratic Republic of Congo, CAR is Central African Republic, and STP is Sao Tome and Principe.

Source: Author's computation and compilation from Heritage Foundation's Index of Economic Freedom <http://www.heritage.org/index/explore> [Accessed July 2013].

Overview of the model and analysis of results

The data

Data for land grab is sourced from the Land Matrix Database, managed by international partnership initiated by International Land Coalition (ILC). The partnership adopts a crowd sourcing approach to identify land deals and subsequently subject them to data triangulation (checked and confirmed). The land matrix initiative emerged from a coalition of research and funding organizations that have worked over time to improve accuracy, crosschecking and verification of land acquisition data.^x

The economic variables such as cereal yield, fertilizer consumption, food production index, gross national income (GNI) per capita and fresh water withdrawal were sourced from the World Development Indicators.^{xi} They are therefore as defined in the World Development Indicators. For instance, cereal yield, is measured as kilogrammes per hectare of harvested land, includes wheat, rice, maize, barley, oats, rye, millet, sorghum, buckwheat, and mixed grains. The inland water per 1000 ha was obtained from the FAO Statistical database.^{xii}

The institutional variables (property rights, corruption index and accountability index) were also derived from the World Development Indicators. They are based on the public sector management and institution cluster averages as defined in the World Bank database. Property rights and rule-based *governance*, for instance, assess the extent to which private economic activity is facilitated by an effective legal system and rule-based *governance* structure in which property and contract rights are reliably respected and enforced.

To normalize the cross section constants, most variables were measured as averages over period where data is available. For instance, the institutional variables were averaged 2005 -2011. On the other hand, the economic variables are based on data availability: fresh water withdrawals (1997-2011), fertilizer consumption (2002 -2009) and GNI per capita (1980 -2011).

Overview of the Model

The concentration of un-utilized arable land in Sub-Saharan Africa and the penchant urge to address food and fuel security challenges, and the associated price incentives for agricultural commodities have been identified as outstanding factors driving the demand for agricultural land in Africa. The shortage of fertile land due to unfavourable climate conditions and the buoyant financial status of such countries as those in Gulf States (e.g. Saudi Arabia, Qatar and UAE) and some in Asia (e.g. China, South Korea and India) contribute to foreign land acquisition (Gorgen *et al*, 2009). The latter is an income effect emphasized in Ando and Shah (2009) particularly from investing countries. Attempt is also made to examine the income effect of targeted countries on large scale foreign land acquisition.

Land productivity plays an important role in land demand for agricultural purpose. Fertility of land promotes crop intensification, thereby reducing demand on land (actual or derived). This is a practical case in Brazil and Japan (Lugschitz, *et al*, 2011). This informs the use of three important variables in the model for demand for land grab in Africa: yield gaps, freshwater water requirement and level of fertilizer utilization. For instance, the role of yield gaps has been emphasized in Hertel (2010), Licker *et al* (2010) and Bruinsma (2009) while Woodhouse and Ganho (2011) conclude that the impact of meeting food and bio fuel security on water constitutes an important hidden agenda of land deals in Sub-Saharan Africa. Rulli *et al* 2013 examine the extent of water resources appropriated through large scale land acquisition. Potter *et al* (2010) and Hertel (2010) underscore the contribution of potential production intensification in driving demand for large scale land in many developing countries (e.g. fertilizer utilization).

This paper employs the ordinary least squares estimation technique to a set of panel data from 28 African countries^{xiii} - based on data availability in the land matrix database. To be able to do this, some vectors of economic and institutional variables are regressed on the log^{xiv} of land acquired by foreign entities in recipient countries in Africa. The model is presented in equation 1 below:

$$lg_{it} = b_0 + \beta A_{it} + \phi B_{it} + \mu_{it} \quad \dots(1)$$

where $_{it}$ stands for a country i in year t , lg is the land grab variable, A is a vector of economic variables, and B is a vector of institutional variables that are considered to be important determinants of foreign demand for land in Africa. Because the data is used as a point variable (average over some period of time), the issue of fixed effect was not examined. To this end, t is equal to 1. μ is a random error term.

A vector of five economic variables were used, namely, inland water per 1000 per ha, crop production index, cereal yield per hectare (log), gross national income per capita (log) and level of fertilizer utilization per hectare. The three-vector of institutional variables are: property right index, corruption perception index and index of accountability.

When the vector of economic and institutional variables is substituted into equation 1, the following equation is derived:

$$lg_{it} = b_0 + \beta_1 crppi_{it} + \beta_2 fert_{it} + \beta_3 ypc_{it} + \beta_4 yd_{it} + \beta_5 wid_{it} + \delta_1 cpi_{it} + \delta_2 aci_{it} + \delta_3 pri_{it} + \mu_{it} \quad \dots(2)$$

where *crppi* stands for crop production index, *fert* is fertilizer consumption. GNI per capita income (*ypc*), yield per hectare (*yd*), inland water (*wid*), corruption perception index (*cpi*), accountability index (*aci*), and property rights index (*pri*).

A semi-log function was applied to the model. Land grab, GNI per capita and yield per hectare were logged while the others were not. To deal with disturbances associated with omitted variables, misspecification and systemic errors in measurement that could bias the estimation technique, the second order iterative procedure of Cochrane-Orcutt framework was used. This enhances the robustness of the results from the panel. The results of the econometric analysis are presented below.

Analysis of the results

Evidence from bivariate analysis

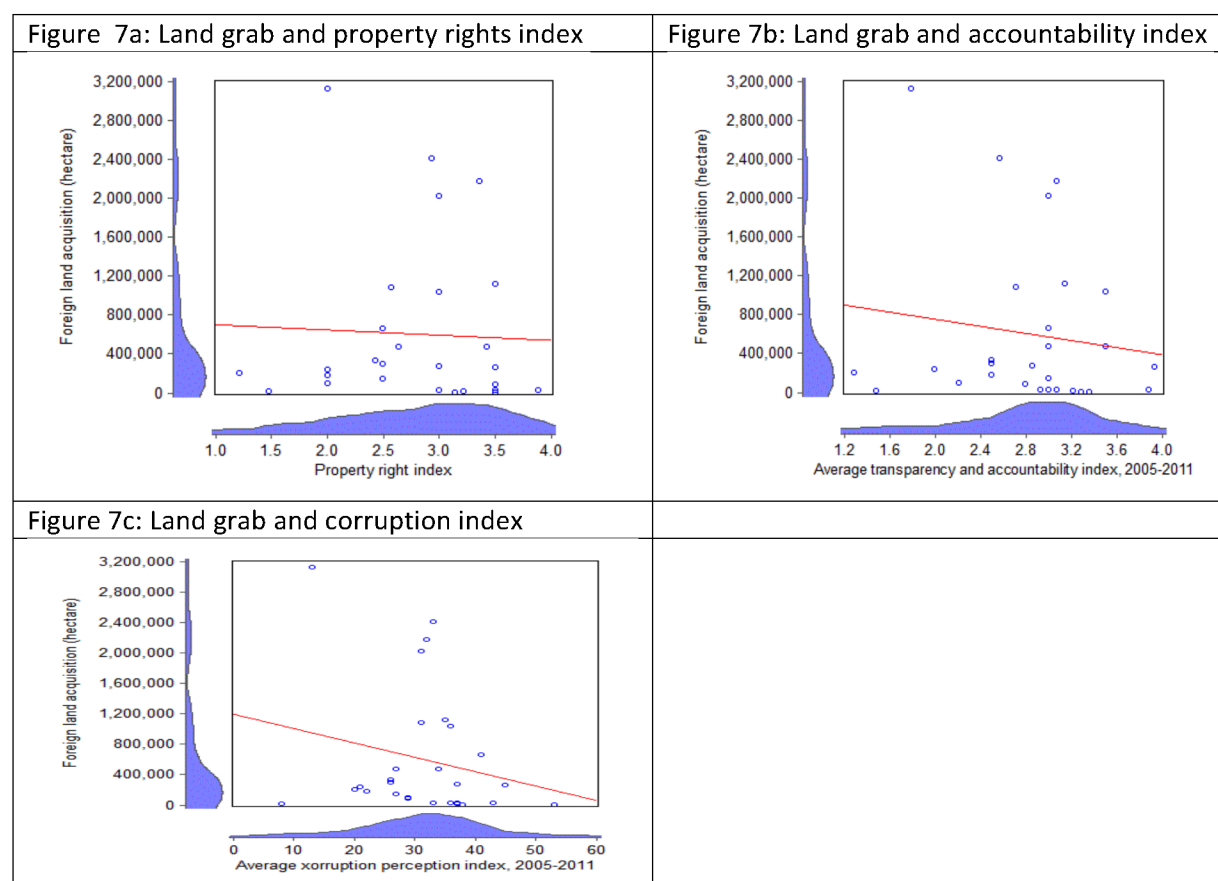
To deepen the analysis of determinants of large scale land acquisition in Africa, a combination of bivariate and multivariate analyzes were applied. Evidence from Table 3 and figures 7, 8 and 9 shows the correlation between land grab on one hand, and economic and institutional variables on the other hand.

Table 3: Results of correlation analysis

	Land grab (lg)	Crop production index (crppi)	GNI per capita (ypc)	Cereal yield (yd)	Fresh water withdrawal (fw)	Property rights index (pri)	Accountability index (aci)	Corruption index (cpi)
Land grab	1.000							
Crop production index	-0.084	1.000						
GNI per capita	-0.230	-0.097	1.000					
Cereal yield	0.071	-0.208	0.325	1.000				
Fresh water withdrawal	0.432	-0.166	-0.216	-0.130	1.000			
Property rights index	-0.196	0.209	0.249	0.418	-0.112	1.000		
Accountability index	-0.162	0.192	0.318	0.397	-0.317	0.882	1.000	
Corruption index	-0.295	0.202	0.202	0.455	-0.319	0.765	0.844	1.000

Results from correlation analysis reveal an inverse relationship between large scale foreign land acquisition and the three institutional factors (corruption index, accountability index and property rights index). The correlation index varies from -0.162 for accountability index to -0.295 for the corruption index. This tends to suggest that land grab would be more intense where corruption, transparency and property rights indexes are very weak. Figures 7a to 7c provide more illumination on these inverse relationships. Countries highly targeted by foreign land investors such as Sudan, Ethiopia and Madagascar scored less than 3.0 points on property rights index^{xv}. About 70 percent of the countries scored 3.0 points and below. The Kernel density function from Figure 7a shows most (about 90 per cent) of the targeted countries clustered between 2.0 and 3.5 points for property rights.

A similar relationship is established in Figures 7b and 7c. On the accountability index, majority of the countries clustered between 2.4 and 3.6 points. The four most targeted countries scored less than 3.2 points on accountability index. All the highly targeted countries scored less than 40 points (out of 100 points) on corruption index. In fact, only 3 out of the 28 countries experiencing land grab in the continent scored less than 40 points. As shown by the Kernel density function (Figure 7c), 23 of them scored between 20 and 40 points. Rwanda, Ghana and Sierra Leone are the only countries with more than 40 points.

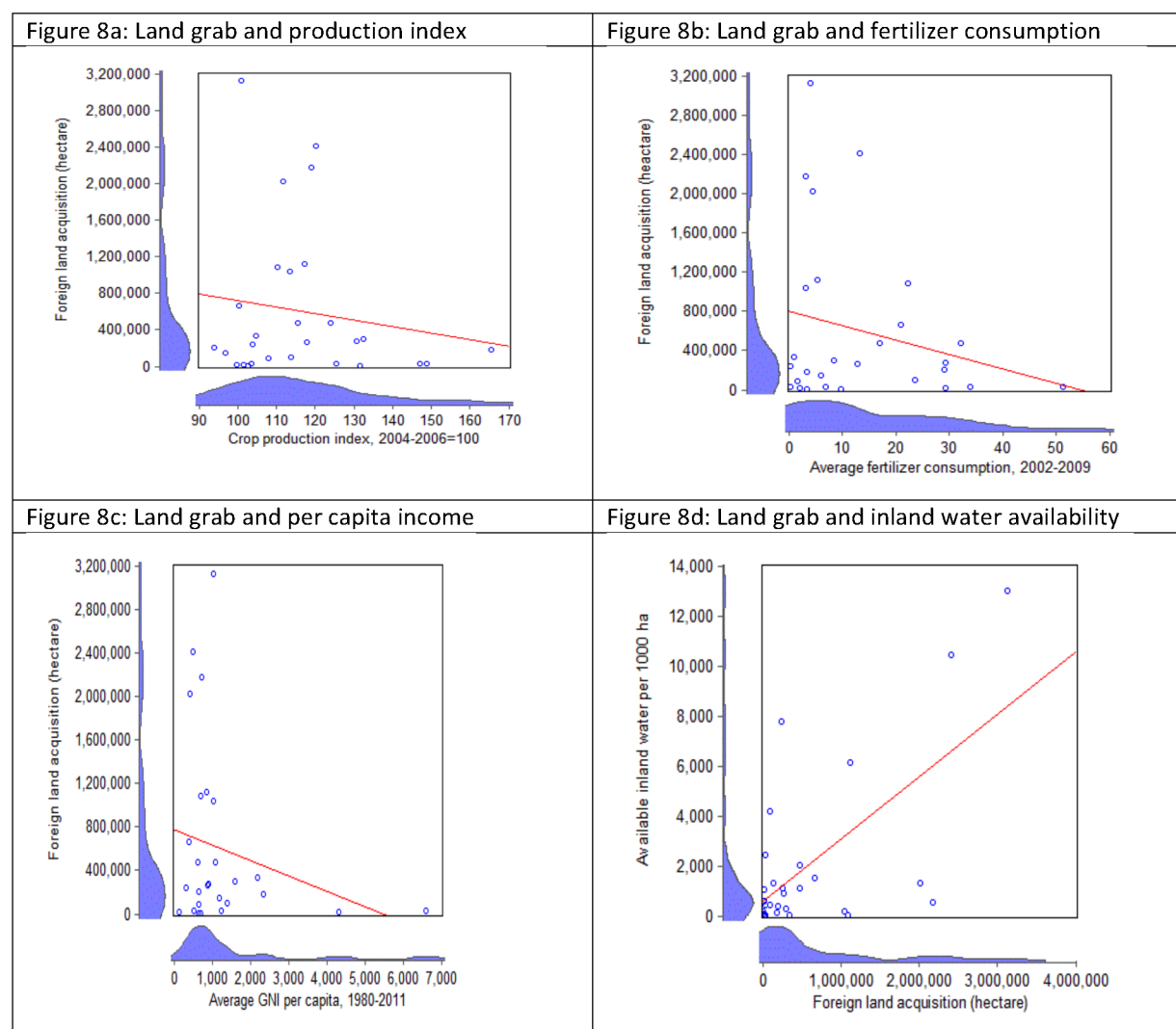


Evidence from the correlation between land grab and economic indexes is quite revealing. The inverse correlation between large scale land acquisition and targeted countries' level of per capita income is relatively strong. Majority of the targeted countries are those with per capita income of about \$1,000.00 and below (Figure 8c). The implication of this is that investing countries are targeting countries with limited capacity to meet the investment requirements of large scale agricultural production (e.g. Ethiopia, DRC, Burkina Faso, Liberia, Madagascar and Mozambique).

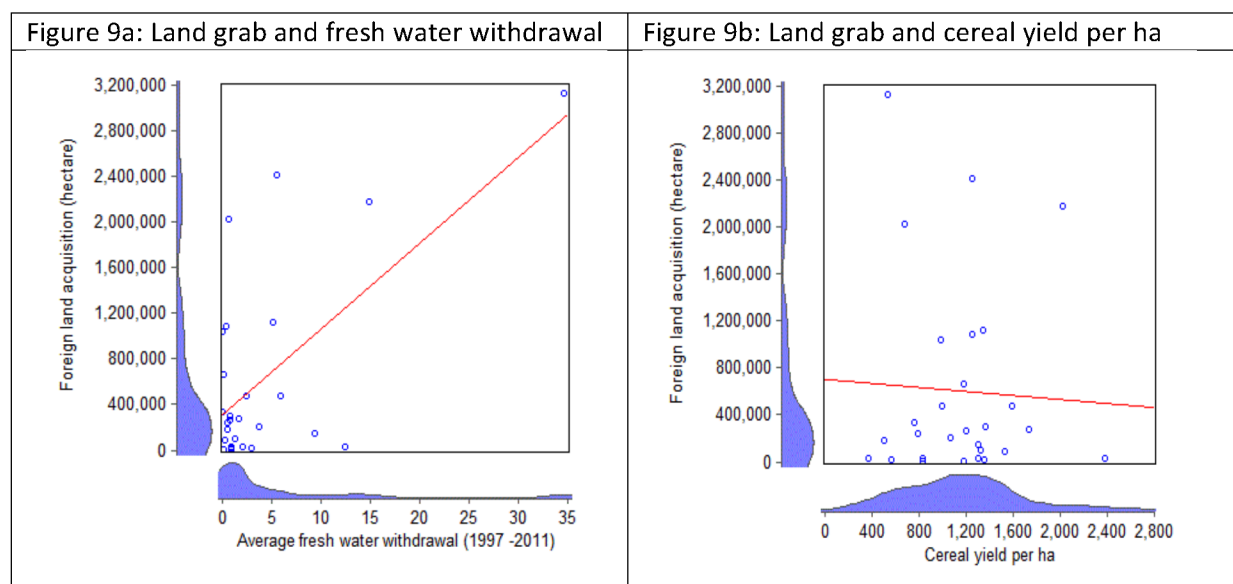
The production index also exhibits some inverse correlation with land grab. The Kernel density function shows land acquisition is more intense in countries with low production index in recent times relative to the 2004-2006 average production index. Fertilizer utilization is used as an index of

crop intensification. This index is always very low in Africa. The negative correlation is quite pronounced (figure 8b). For instance, land acquisition is much more pronounced in countries experiencing very low fertilizer consumption. Land grab clustered more in countries with less than 20kg of fertilizer per hectare (e.g. Sudan, DRC, Niger, Congo, Angola, Uganda and Madagascar).

As earlier presented, water is very critical to agricultural land demand. There is high correlation between inland water availability (per 1000 ha) and large scale land acquisition. Land acquisition tends to be low in countries with less than 2000 cubic feet of inland water availability (excepting Sierra Leone, Madagascar, and Mozambique) (Figure 8d). Land grab is highest in countries with tremendous inland water resources especially those with over 10,000 cubic feet of inland water (e.g. Sudan and Ethiopia). A similar positive trend is also observed for fresh water withdrawal (see Figure 9a). Demand for land is low where fresh water withdrawal is very low and tends to be high when the converse holds.



As evident in Figure 9b, there is a negative relationship between foreign demand for agricultural land and cereal yield per hectare. Given high yield potential in Africa, which Deininger and Byerlee (2011) currently put at only one-fifth of the targeted potential, this tends to suggest that yield gap plays an important role in land demand in Africa. The relationship between the two variables shows a bimodal Kernel density function and the series clustered between 400 and 1,600 kg per hectare.



Evidence from multivariate analysis

Results from multivariate analysis also reinforce the evidence from foregoing correlation exploration. An important message from the literature of global food security is premised on the need to increase agricultural productivity in low income countries where the yield gap is quite large (Nkonya *et al*, 2012). The findings from this study tend to support this conclusion. For instance, there is an inverse relationship between demand for agricultural land by foreigners and level of per capita income. One percentage increase in per capita income reduces propensity for foreign demand for land by 1.02 per cent. This relationship is statistically established at 5 per cent level of significance. This, to a large extent, explains why large scale land acquisition is dominant in low income countries such as Sudan, Ethiopia, Madagascar, Tanzania, Benin and Sierra Leone.^{xvi} Providing the needed capital to small farm holders, medium and large scale agro-businesses in these countries, targeted towards agricultural productivity, could reduce the incentives for foreign demand for land.

Many studies have confirmed the wide gap between the actual and potential yields in Africa. As computed by Deininger *et al* (2011), Africa is only at 20 percent, 32 per cent and 54 per cent of its maize, soyabean and sugarcane potential as opposed to 65 per cent, 67 per cent and 93 per cent in South America. The finding from this paper tends to support that because of high potential of yield

expansion, many foreign investors demand for African arable land. For instance, 1 per cent increase in cereal yield raises foreign demand for land by 3.8 per cent. This is established at 99 per cent confidence interval. The relationship with crop production index is also positive but not statistically established. An important way of reducing the rising intensity of land grab is for Africans to bridge the yield gap substantially. One way of doing this is for African governments and their private sector counterparts to invest in improved seedlings, increased access to inputs and capital, and promote technology acquisition.

Agricultural productivity has been linked to fertilizer consumption rate globally and has contributed to varying level of productivity across different regions. Demand for land grab in Africa is concentrated in countries with low fertilizer consumption. For instance, a one percentage point change in fertilizer utilization between 2002 and 2009 tend to reduce demand for land in such countries by about 0.03 per cent. However, this relationship is not statistically established. As such, it is not considered to be an important factor in explaining the rush for agricultural land in Africa.

Many studies have mentioned, though not quantified, the role of water resources in demand for agricultural land (e.g. Nkonya *et al*, 2012), and Woodhouse and Ganho (2011)). Given the large scale orientation of such farming system, it requires a combination of 'green' water (e.g. rainfall and plant transpiration) and 'blue' water resources (e.g. rivers, lakes and aquifers). This paper examines the role of inland water resources (i.e. blue water) play in demand for land in Africa. Evidence from this paper reveals that countries with substantial inland water resources are more likely to experience intense land demand from foreigners. For instance, a 1.00 percentage point increase in the volumes of inland water resources raises demand for land by about 0.0003 per cent. Although the coefficient is very small, the statistical evidence is quite strong (1.00 per cent level of significance). This finding tends to support the arguments that most land grabs are located in the major rivers floodplains in many countries (e.g. Ethiopia, Liberia, Mali, Madagascar, Niger, Senegal, Sierra Leone and Sudan).

Government needs to invest heavily in water resources management. This includes developing the water resources management capacity (underground water, rainwater, and run-off water). This requires promoting water harvesting technologies, utilization and management, building capacity in rainwater harvesting among professionals, technicians, artisans, farmers and communities. Effort to develop medium and large scale irrigation system to support commercial farming among local and elite farmers is equally important to reduce incentives for land grab.

Table 4: Regression results with land grab (lg) as the dependent variable

Variables	Coefficient	t-statistics	Probability
Constant	-11.211	1.968	0.067
cpi	-0.164	-3.489	0.003
aci	4.062	3.739	0.002
pri	-2.229	-2.434	0.027
crppi	0.026	1.458	0.164
fert	-0.025	-1.039	0.313
lypc	-1.022	-2.850	0.011
lyd	3.815	5.367	0.000
wid	0.0003	4.686	0.002
Coct ²	-0.785	-4.666	0.000
Equation statistics Adjusted R ² 0.56 F-statistics 4.481 Probability 0.004 DW Statistics 1.80			

Note: Coct² stands for the 2nd order Cochrane Orcutt procedure while other variables are as defined above.

The inverse relationship between property rights and land grab is a clear confirmation that the weak and low rate of land titling, registration and certification crates incentives for land grab. One percentage point improvement in property rights in Africa reduces foreign demand for African land by more than two percent. This is clear evidence that the current practice where more than 90 percent of Africa's rural land is undocumented, makes it highly vulnerable to land grabbing and expropriation with poor compensation. This confirms findings from Arezkiet *al* (2011), which observed that weak land governance and tenure security for current users make countries more attractive for investors. This tends to confirm the main message from Byamugishe (2013) that modernizing the complex governance procedures on land ownership and management, including documenting rural land is vital to reducing land grab in the continent. This includes championing

reforms and investments to document all communal lands and prime lands that are individually owned. The innovation in communal land registration and certification is making land titling accessible to the poor people in several countries. For instance, the cost of the certification was estimated to be as low as \$1.00 per plot and \$3.50 per farm household (Deininger *et al.*, 2008) compared to the cost of \$150.00 in Madagascar which is still relied on demand based land titling (Jacoby and Minten, 2007). Compared to very prohibitive price when it was based on individual basis, it is an average cost of about US\$500 per village in Tanzania and it ranged between US\$500 and S\$700 per kilometer in Ghana. It is still relatively expensive in Mozambique - the unit cost of delimiting and certifying a community land ranges between US\$2,000 and US\$10,000 (Byamugisha, 2013). Innovations on land titling and registration are also taking place in several countries including Malawi and Uganda. All these point to the fact that with strong commitment from the political leaders to build on current efforts, improved land governance and management is achievable in Africa.

Land administration has been acknowledged as a major source of rent seeking and corrupt practices in developing countries (e.g. Van der Molen and Tuladhar (2007), and Byamugisha (2013)). In addition to the findings from the bivariate analysis, the results from the regression show an inverse relationship between corruption and land grab. It reveals that one percentage point improvement in corruption reduces foreign demand for land by 0.16 per cent. Therefore, tackling the weak governance and corruption associated with land governance and administration in Africa will not only reduce incentives for land grab but will make large scale agricultural investments more beneficial to the rural dwellers whose livelihoods are tied to the land. In-depth study of the major sources of corruption in land management should be undertaken for appropriate policy actions to be determined.

In contrast with the negative relationship between accountability index and land grab, the regression result shows a positive association. This is contrary to the extant literature (e.g. Zoomers, 2010), it tends to suggest demand for land rises when the land governance system is accountable. Perhaps, based on the rising wave of conflicts associated to many of land deals in the continent, foreign land investors now see accountability as an important factor for land security and use. This notwithstanding, local landowners must be fully involved in the negotiations of such land deals while adequate compensation is also a prerequisite.

The model's goodness of fit, as measured the adjusted R^2 , is 0.56 and the F-statistics for the model is statistically established at 99 per cent confidence interval. To this end, the reliability of the model estimates is good.

Conclusions

There is a clear evidence of unprecedented demand for large scale agricultural land in Africa. Apart from accounting for over 60 percent of land deals globally, seven of the 11 most targeted countries are from the continent. This paper bridges some knowledge gap by adding to the empirical evidence on demand for arable land in Africa. The paper shows that both economic and institutional factors play some vital role in intensifying the scrambling for African arable land. Countries with large unused arable land as well as those countries experiencing high yield gap with per capita income of about \$1,000.00 and below are the primary target due to limited capacity to meet the investment requirements of large scale agricultural production. Strategies that promote income capacity of small farm holders and agro-businesses, through access to low-interest bearing or subsidized credits, are vital in providing the required investments to improve local utilization of such arable lands.

Evidence from the analysis also reveals that availability of inland water resources as is a major determinant. While most of the leading land acquirers are under serious water pressure, the converse holds for most of the targeted countries. The rising and higher pressure on water in Sudan and Madagascar relative to such acquirers as Saudi Arabia, United Kingdom, Malaysia and UAE, tends to suggest that the later countries have started to pass the burden to the former (Sudan and Madagascar). Reversing this trend is vital in countries that have started to experience this water burden. Government of targeted countries need to invest heavily in ground water, rainwater and run-off water management and develop national stakeholders' capacity to better manage integrated water resources for agricultural transformation. Appropriate policies should be put in place to ensure foreign land acquisition does not compromise water use for domestic and industrial purposes.

Weak governance and related institutional challenges also come out very strongly as key determinants. Both property rights and corruption appear to have inverse relationship with land grab. The current weak property rights and endemic corruption create incentives for demand for arable land in the continent. Africa needs to modernize and simplify the complex land management and procedures in a way that involves people and communities in land governance. The political class and the CSOs should champion land reforms and serve as vanguard of the poor. Government, on the other hand, should invest heavily in documenting (titling, registration and certification) all communal lands and lands owned by individuals to enhance property rights. The innovations already in place in countries like Ethiopia, Ghana, Malawi, Mozambique, Tanzania, and Uganda should be strengthened and replicated in other African countries. A continent-wide strategy is vital in accelerating progress on this. To avoid the inherent risks associated with large-scale land acquisition, African governments should promote other forms of investment such as joint ventures or contract farming and out-grower schemes or investments. These are vital to promoting livelihoods and security of supply to investors without dislodging people of their cherished landed asset.

There seems to be some emerging lessons from the rising wave of conflicts, production disruption and uncertainty associated with many land deals in the continent. It appears foreign land investors now see accountability as an avenue of land security and use. This reality should be deepened by ensuring local chiefs and landlords fully involve local people in the negotiations of land deals, their consent sought and adequate compensation provided when their lands are acquire

ⁱ See Bruinsma (2009), Anseeuw et al (2012) and Nkonya et al (2012) for more illumination on regional share of large scale land acquisition across developed and developing regions and Odusola (2014 a)for relative share of land grab to African landmass.

ⁱⁱ Friis and Reenberg (2010) use the blog from the International Land Coalition blogs while Deininger et al use the GRAIN blogs.

ⁱⁱⁱ Several factors explain the differences in land grab figures. For instance, the Oxfam's study is longer in time coverage and it covers agriculture, mining and timber concessions while the previous two inventories are restricted to only agriculture. In addition to difference in sources, there are also differences in method of inventory. For instance, only projects above 1,000 ha were considered by Cotula et al (2009) while Gorgen *et al* (2009) capture land 'demanded' but not necessarily approved deals. Variation also occurs through coverage. Using Ethiopia as an example, Deininger *et al* (2011) include land allocations by regional government agencies, while Cotula *et al* (2009) only include allocations by federal government agencies and by Oromia regional government.

^{iv} The Land Matrix monitors land transactions in rural areas that are made for agricultural production (for food or agro-fuel production), timber extraction, carbon trading, mineral extraction, conservation, and tourism (see <http://landportal.info/landmatrix/media/img/get-the-idea/top-10-target-countries.pdf>).

^v Computations from the Ethiopian Ministry of Agriculture portal reveal an average of 14.6 ha when Ethiopians and Ethiopians in Diaspora acquisitions are included. The average for only foreign acquisition is 28.5 ha.

^{vi} Eritrea, Liberia, Malawi, Sierra Leone, Togo, Lesotho, Guinea Bissau, Equatorial Guinea, Burundi, Rwanda, Djibouti, Swaziland, Gambia, Cape Verde, Comoros, Mauritania, Sao Tome and Principe and Seychelles (Odusola, 2014a).

^{vii} Other countries are Philippines, Brazil, Pakistan and Indonesia.

^{viii} See Cotula (2012) for this type of partnership.

^{ix} Nkonya *et al* (2012) provide some illustrations on how local chiefs have sown limited sense of accountability on land management in DRC.

^x See <http://www.landmatrix.org>.

^{xi} See <http://data.worldbank.org/indicator>. [Accessed, July 2013].

^{xii} See <http://faostat.fao.org>.

^{xiii} Angola, Benin, Burkina Faso, Cameroon, Congo, Cote d'Ivoire, DRC, Ethiopia, Ghana, Kenya, Liberia, Madagascar, Malawi, Mali, Mozambique, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, Somalia, South Africa, Sudan, Swaziland, Tanzania, Uganda, Zambia and Zimbabwe.

^{xiv} The use of logarithmic (log) transformation allows for the measure of elasticity (changes in land demand as a result of changes in economic and institutional variables).

^{xv} The World Development Indicators rate countries on property rights from 1.0 (very low) to 6.0 (very high).

See <http://search.worldbank.org/data?qterm=Governance%20indicator&language=EN>

^{xvi} Most of these countries have a per capita income of about \$1,000.00 and below.

References

Ando, A.W. and P. Shah, 2009. Demand for factors in optimal land choice, paper presented at the Agricultural Economics Association 2009 and the ACCI Joint Annual Meeting, Milwaukee, Wisconsin, July 26-29, 2009.

Anseeuw, W., M. Boche, T. Breu, M. Giger, J. Lay, P. Messerli and K. Nolte, 2012. Transnational Land Deals for Agriculture in the Global South, *Analytical Report based on the Land Matrix Database Number 1*: April 2012. Available from: <http://farmlandgrab.org>. [Accessed May 2012].

Arezki, R., K. Deininger and H. Selod, 2011. What drives the global land rush?, *IMF Working Paper (WP/11/251)*, The International Monetary Fund, 2011.

Aw, D. and G. Diemer, 2005. Making a Large Irrigation Scheme Work. A Case Study from Mali. *Directions in Development*. Washington, DC: The World Bank.

Bruinsma, J., 2009. The resource outlook to 2050. By how much do land, water use and crop yields need to increase by 2050? In *Session 2: The resource base to 2050: Will there be enough land, water and genetic potential to meet future food and biofuel demands?* Rome, Italy, June 24.

Byamugisha, F.F.K., 2013. *Securing Africa's land for shared prosperity: A programme to scale up reform and investments*. Washington, D.C.: The World Bank.

Cotula, L., S. Vermeulen, R. Leonard and J. Keeley, 2009. *Land grab or development opportunity? Agricultural development and international land deals in Africa*. London: International Institute for Environment and Development, Rome; Food and Agricultural Organization, Rome: International Fund for Agricultural Development.

Cotula, L., 2011. *Land deals in Africa: What is in the contracts?* London: International Institute for Environment and Development (IIED). Available from: <http://pubs.iied.org/12568IIED.html> [Accessed July 2013].

Cotula, L., 2012. The International Political Economy of the Global Land Rush: A critical appraisal of trends, scale, geography and drivers, *The Journal of Peasant Studies*, Vol. 39, Nos. 3–4, July–October 2012, 649–680.

Deininger, K. and D. Byerlee, with J. Lindsay, A. Norton, H. Selod and M. Stickler, 2011. *Rising global interest in farmland: can it yield sustainable and equitable benefits?* Washington, DC: The World Bank.

Deininger, K., 2011. Challenges posed by the new wave of farmland investment, *Journal of Peasant Studies*, <http://www.tandfonline.com/loi/fjps20>

Deininger, K. and D. Byerlee, 2011. The Rise of Large Farms in Land Abundant Countries: Do They Have A Future?, *Policy Research Working Paper 5588*, March 2011.

Deininger, K., D. A. Ali, S. T. Holden and J. Zevenbergen, 2008. Rural land certification in Ethiopia: Process, initial impact, and implications for other African countries. *World Development* 36, pp. 1786-1812.

Food and Agricultural Organization (FAO), 2009. *The State of Agricultural Commodity Markets 2009*. Rome: United Nations Food and Agriculture Organization.

FAO 2005. Irrigation in Africa in figures, *Aquastat Survey (2005)*. Rome: The United Nations Food and Agriculture Organisation.

Fischer, G., van Velthuisen, H., Shah, M. and F. Nachtergaele, 2002. *Global Agro-ecological Assessment for Agriculture in the 21st Century: Methodology and results*, RR-02-002, Laxenburg: International Institute for Applied Systems Analysis (IIASA).

Food and Agricultural Organization (FAO), International Fund for Agricultural Development (IFAD), United Nations Conference on Trade and Development (UNCTAD) and The World Bank, 2010. Principles for Responsible Agricultural Investment that Protect Rights, Livelihoods and Resources. *Discussion Note 25 January 2010*. Rome: FAO, IFAD, UNCTAD and the World Bank Group. Available from http://siteresources.worldbank.org/INTARD/214574-111138388661/22453321/Principles_Extended.pdf. [Accessed June 2012].

Friis, C. and A. Reenberg, 2010. Land Grab in Africa: Emerging land system drivers in a teleconnected world. GLP Report No.1. Copenhagen: GLP-IPO , University of Copenhagen..

Garvelink, W.J., 2012. "Land Tenure, Property Rights, and Rural Economic Development in Africa", Centre for Strategic and International Studies, February 2012. Available from <http://csis.org/publication/land-tenure-property-rights-and-rural-economic-development-africa>. [Accessed June 2013].

Gorgen, M., B. Rudloff, J. Simons, A. Ullenger, S. Vath and L. Wimmer, 2009. Foreign direct investment (FDI) in land in developing countries. Eschborn: GTZ Division 45 – Agriculture, Fisheries and Food, GTZ.

GRAIN, 2008. Seized! The 2008 land grab for food and financial security. *Briefing October 2008*. Barcelona: GRAIN.

GRAIN, 2009. The new farm owners: corporate investors lead the rush for control over overseas farmland[online]. GRAIN: Barcelona: GRAIN, 20 October 2009. Available from: <http://www.grain.org/article/entries/194-the-new-farm-owners>. [Accessed June 2013].

GRAIN, 2010. Saudi investors poised to take control of rice production in Senegal and Mali [online]. 29 November 2010. Available from: <http://www.grain.org/article/entries/3997-saudi-investorspoised-to-take-control-of-rice-production-in-Senegal-and-Mali>. [Accessed July 2013].

GTZ,2009. *Foreign direct investment (FDI) in land in developing countries*. Eschborn : Work of division 45, Agriculture, fisheries and food, GTZ.

Hall, R.,2011. "Land Grabbing in Southern Africa: The Many Faces of the Investor Rush", Paper for STIAS Colloquium on Land reform, agrarian change and rural poverty in Southern Africa Venue: Wallenberg Conference centre, Stellenbosch, 8-9 March 2011.

Hertel, T., 2010. The global supply and demand for agricultural land in 2050: A perfect storm in the making, *GTAP Working Paper No 63*.

Haralambous, S., H. Liversage and M. Romano, 2009. The growing demand for land: Risks and opportunities for smallholder farmers. *Discussion Paper for Round Table 2, Governing Council*, 18-19 February 2009, IFAD.

International Food Policy Research Institute (IFPRI), Welt Hunger Hilfe and Concern Worldwide and Green Scenery, 2012. *2012 Global Hunger Index: The Challenge of hunger: ensuring Sustainable Food Security under land, water and energy stress*. Bonn, Washington, DC, and Dublin: IFPRI Concern Worldwide, Welthungerhilfe and Green Scenery.

International Institute for Environment and Development (IIED), 2012. The Global Land rush: What the evidence reveals about scale and geography? *IIED Briefing on the Global Land Rush*. Available from IIED: <http://pubs.iied.org/pdfs/17124IIED.pdf> . [Accessed June 2013].

Inter Press Service (IPS), 2013. World Bank boosts agricultural lending ahead of MDG Meet.

<http://ipsnews.net/news.asp?idnews=52815>. [Accessed July 2013].

IS Academie, 2012. Ethiopia: Food security and land governance factsheet. Land Governance for Equitable and Sustainable Development. Available from:

<http://www.landgovernance.org/system/files/Ethiopia%20Factsheet%20-%202012.pdf>.

Land Matrix, 2012. Land Matrix data (April 2012). Available from:

<http://landportal.info/landmatrix/media/img/get-the-idea/top-10-target-countries.pdf>. [Accessed May 2012].

Jacoby, H. G. and Minten, B., 2007. Is Land Titling in Sub-Saharan Africa Cost-Effective?

Evidence from Madagascar. *The World Bank Economic Review* 21(3), pp. 461-485.

Licker, R., M. Johnston, C. Barford, J. A. Foley, C. J. Kucharik, C. Monfreda, and N. Ramankutty, 2010. Mind the Gap: How do climate and agricultural management explain the “yield gap” of croplands around the world? *Global Ecology and Biogeography*, Volume 19, Issue 6, pp. 769-782.

Lugschitz, B., Bruckner, M. and S. Giljum, 2011. Europe global land demand: A study on the actual land embodied in European imports and exports of agricultural products. Final Report, Sustainable Europe Research Institute (SERI). Vienna: SERI.

Mann, H. and Smaller, C., 2010. Foreign Land Purchases for Agriculture: what impact on sustainable development? *Sustainable Development Innovation Brief No 8.*. New York: United Nations Department of Economic and Social Affairs.

Miller, T., K.R. Holmes, E.J. Fueler, A.B. Kim, B. Riley and J.M. Roberts, 2013. *2013 Index of Economic Freedom*. Washington DC: The Heritage Foundation.

Neumann, K. , P. H. Verburg, E. Stehfest, and C. Müller, 2010. The yield gap of global grain production: A spatial analysis, [*Agricultural Systems*](#), 2010, vol. 103, issue 5, pp. 316-326.

Nkonya, E., A. Karsenty, S. Msangi, C. Souza Jr, M. Shah, J. von Braun, G. Galford, and S. Park, 2012. "Sustainable land use for the 21st century", United Nations Department of Economic and Social Affairs Division's Project on Sustainable Development in the 21st Century (SD21), May 2012

Odusola, Ayodele (2012): Land Grab in Africa: An Overview of Emerging Issues and Policy Options. *Mimeograph*. UNDP Regional Bureau for Africa, New York.

Odusola, A.F., 2014a. Land grab in Africa: A review of emerging issues and implications for policy options. *International Policy Centre for Inclusive Growth Working Paper 124*, April 2014.

Odusola, A.F., 2014b. Land grab in Africa: A review of emerging issues and implications for policy options. *International Policy Centre for Inclusive Growth One Pager No. 248*, April 2014.

Oxfam, 2010. Addressing land grabbing in Africa: why governments should stand up for marginalized communities. Oxford: Oxfam.

Oxfam, 2011. Land and power: the growing scandal surrounding the new wave of investments in

land. *Oxfam International Briefing Paper 51*. Oxford: Oxfam.

Polack, E., L. Cotula and M. Cote, 2013. Accountability in African Land Rush: What role for local empowerment? London: International Institute of Environment and Development and International Development Research Centre (IDRC).

Potter, P., N. Ramankutty, E. M Bennett, and S. D. Donner, 2010. Characterizing the Spatial Patterns of Global Fertilizer Application and Manure Production. *Earth Interactions* 14, no. 2, pp. 1-22.

Prishchepov, A.V., Radeloff, V.C., Muller, D., Dubinin M. and Baumann, M., 2011. Determinants of agricultural land abandonment in post-soviet European Russia. *No.1 No 1, IAMO Forum 2011: Will the "BRICs Decade" Continue? – Prospects for Trade and Growth* from [Leibniz Institute of Agricultural Development in Central and Eastern Europe \(IAMO\)](#).

Richardson, B., 2010. Big sugar in Southern Africa: rural development and the perverted potential of sugar/ethanol exports. *Journal of Peasant Studies*, 37(4), pp.917–938.

Robertson, B. and P. Pinstrup-Andersen, 2010. Global Land Acquisition: Neo-colonialism or development opportunity? *Food Security (2010)* 2, pp. 271-283.

Rulli, M.C., A. Savio and P. D’Odorico, 2013. Global land and water grabbing. Proceedings of the Scoones, Ian, Ruth Hall, Saturnino M. Borras Jr, Ben White and Wendy Wolford (2013): “The Politics of Evidence: Methodologies for understanding the global land rush”, *The Journal of Peasant Studies*, volume 40, no 3, pp. 469-483.

United Nations Development Programme (UNDP), 2006. Beyond Scarcity: Power, poverty and the global water crisis Human Development Report 2006. New York: United Nations Development Programme.

United Nations (2013): World Population Prospects: The 2012 Revision – Key findings and advanced tables. New York: UN Department of Economic and Social Affairs, 2013.

United Nations Development Programme (UNDP), 2012. African Human Development Report 2012: Towards a food secure future. New York: UNDP.

Van der Molen, P. and A. Tuladhar, 2007. Corruption and Land Administration, *International Federation of Surveyors, Article of the Month*, March 2007, The Netherlands,
http://www.fig.net/pub/monthly_articles/march_2007/march_2007_vandermolen_tuladhar.pdf

Woodhouse, P. A and S. Ganho, 2011. "Is water the hidden agenda of agricultural land acquisition in Sub-Saharan Africa?" Paper presented at the International Conference on Global Land Grabbing, 6-8 April 2011. Organized by the Land Deals Politics Initiative (LDPI) in collaboration with the Journal of Peasant Studies and hosted by the Future Agriculture Consortium at the Institute of Development Studies, University of Sussex. Available from:
http://www.iss.nl/fileadmin/ASSETS/iss/Documents/Conference_papers/LDPI/12_P_Woodhouse_and_A_S_Ganho.pdf . [Accessed June 2013].

World Bank, 2010. *Rising Global Interest in Farmland: Can it yield sustainable and equitable benefits?* Washington DC: The World Bank.

World Bank, FAO and Agricultural Rural Development (2009): Awakening Africa's Sleeping Giant: Prospects for Commercial Agriculture in the Guinea Savannah Zone and Beyond, *Agriculture and Rural Development Notes, Issue 48, June 2009*. Washington, DC: The World Bank.

Zoomers, A., 2010. "Globalization and the foreignisation of space: Seven processes driving the current global land grab", *Journal of Peasant Studies*, 37:2, pp. 429-447.