# Global Land Grabs

## Patterns, Processes, and Potential Contributions to Food Security

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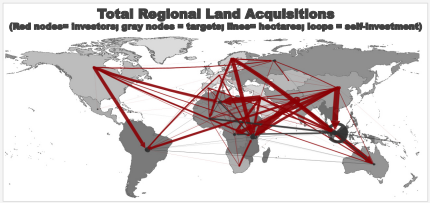
### The key challenge

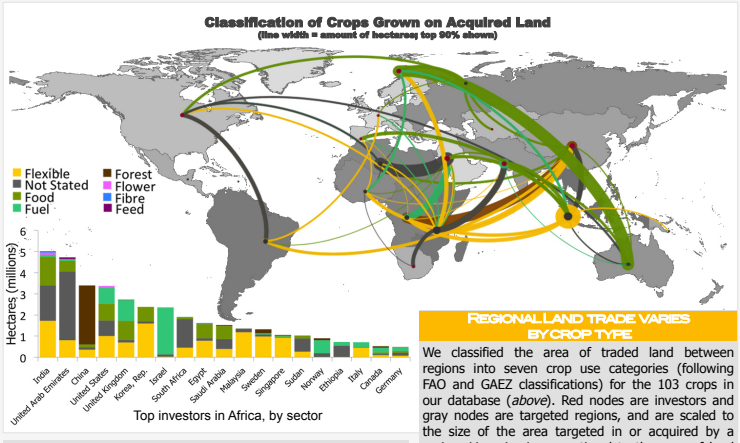
Land is becoming an increasingly scarce and contested resource. Recent international large-scale land acquisitions can potentially impact local livelihoods and global trade and ecosystem services, including the production of food, fuel, and fiber. Here we classified and synthesized recently published data from GRAIN and the Land Matrix Partnership to identify 1,373 unique transactions in "virtual land," which we used to visualize the spatial and structural patterns of such land grabs.


### Northern investors acquire southern land

In total, an area of 1.02 million km$^2$ has been reported in international land deals since 2000; this is an area the size of Ethiopia. The area virtually traded by land grabs is shown by gray shading (darker for regions with more areas targeted, *above*). Nodes are scaled to the total amount of land either acquired (gray) or invested in (red) in each region. The trade in land between regions is represented by the width of each line, with arrows pointing towards targeted countries. Southeast Asia is the largest targeted region, with self-investments from within the region (shown as a loop), Eastern Asia, and Northern Europe. The second-largest target is Eastern Africa, with investors from Europe and the Middle East.

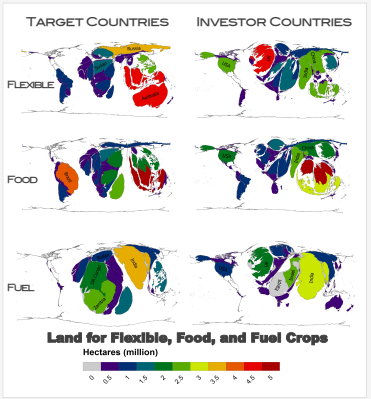
Targeted land is largely in the global South (region size shown proportional to total acquired area, *above left*). Nearly half of acquired hectares are in Africa. The top regions are Southeast Asia (23%), Eastern Africa (21%), South America (11%), Eastern Europe (6%), and Oceania (5%). Nearly half of targeted hectares were acquired by Asia, led by Southeast (18%) and Eastern Asia (15%). Other key investors are Europe (19% total), the Middle East (14%), and North America (9%).




### Regional land trade varies by crop type

We classified the area of traded land between regions into seven crop use categories (following FAO and GAEZ classifications) for the 103 crops in our database (*above*). Red nodes are investors and gray nodes are targeted regions, and are scaled to the size of the area targeted in or acquired by a region. Line size is proportional to the area of land traded by crop type. The largest categories of regional trades by area are investments by Northern Europe in food crops (mainly livestock) in Oceania, a variety of investments in Eastern Africa, self-investment in flexible crops in Southeast Asia, and Middle Eastern investment in fuel and East Asian investments in forest crops in Central Africa.

The crops grown in many of the largest deals in Africa are not stated (*above*); the rest are heavily invested in flexible crops.

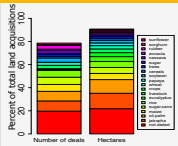



### Non-food crops dominate production on acquired land

For the 80% of deals where the crops being grown were reported, most crops were classified as flexible (37%), food (33%), or fuel (17%). National investors displayed different strategies (*left*), with China and the US acquiring land primarily for food and flexible crop production, the UK for food and fuel crops, and India for fuel crops. For target countries, flexible crops are produced in Brazil, Eastern Africa, and Southeast Asia; food crops are being grown largely in Australia, Sudan, and Russia; and fuel crops in Western Africa and India.

### A few flexible crops make up majority of production on targeted land

For the ca. 80% of deals with reported crops, the top 20 out of 103 crops accounted for 80% of hectares and 70% of deals (*right*). Jatropha (fuel) and the flexible crops oil palm, maize, and sugar cane were the top crops produced.




### Food crops currently grown in Africa do not maximize potential calorie production

Using calculations of potential production quantity, based on 95% of potential yield specific to soils and climate of each country,[1] we found that the acquisitions of land for cereal production in Africa* could potentially produce 7-14% of the current cereal production for all of Africa. However, the cereals currently selected for planting (areas shown in black numbers by country, *right*) are not in optimal locations for maximizing calorie production,[2] shown as potential calorie yield per ha (increasing with darker green colors, *right*). To maximize calorie production and contribute to food security, investments should be in dark green areas. For example, we calculated that if the large wheat investments in Sudan (starred, *right*) instead produced sorghum or maize, calorie production would increase 40%. Overall, crop switching within land acquisitions could increase total calorie production from cereals in Africa by 20%, largely by switching from growing wheat and rice in Eastern and Western Africa to producing maize and sorghum. 1, IIASA and FAO, GAEZ, 2012; 2, calculated from Conte, 2009. *Using only deals from the GRAIN database.