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Between two hypes: Will "big data" help unravel blind spots in understanding the "global land rush?"

Annelies Zoomers [a,*,1], Alex Gekker [b,2], Mirko Tobias Schäfer [b,3]

[a] Department of Human Geography and Planning, Faculty of Geosciences, Utrecht University, The Netherlands
[b] Institute for Cultural Inquiry (ICON), Department of Media and Culture Studies, Utrecht University, The Netherlands

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ABSTRACT

The past several years have seen a huge number of publications, conferences and campaigns on "land grabbing" or large-scale acquisition of land, most often in Africa. Land-grabbing became a fiercely debated issue and the attention rapidly evolved into a real hype which has generated a wealth of knowledge. This global land grab awareness has coincided in time with the "big data" discussion which is one of the most hyped terms today in both academia and business, suggesting that the availability of datasets of increasing volume, velocity and variety can help to better understand reality.

This article aims to critically review to what extent the availability of huge amounts of information about the land grab debate, including new sources of big data, has helped to untangle land grabbing and – more particularly – raising new questions and formulating new hypotheses that have been overlooked in the past. What is the value of digital methods and data driven research through online platforms for identifying knowledge gaps and proposing solutions? Our article shows the value of big data in uncovering new realities but also challenges to not become overwhelmed – while making more efforts than ever to look at the quality – and reliability – of information. Keep doing empirical research – and keep our feet on the ground while also learning from "virtual space" – is a sine qua non – for keeping track and making sensible interpretations. In many cases, however, there is a discrepancy between what is reported (big data) and what is important.

1. Introduction

The past decade has seen a huge number of publications, conferences and campaigns on a new phenomenon which has become known as the 'global land rush' or 'land grabbing'[4]: the issue of large-scale land acquisitions in developing countries by domestic and transnational companies, governments, and individuals. This hype started around 2007, following the world food price crisis, when the media started to report on the threats of a new global trend:

"Capital rich countries with limited possibilities to produce their own food, such as China, South Korea, Japan, Saudi Arabia, Kuwait and others, have been scouring the globe in search of arable land to buy or to lease for the production of crops for food or biofuels". (GRAIN, 2008a, 2008b, n.p.). This report, published by a non-governmental organization, contained an appendix listing more than 100 cases of land grabbing for offshore food production (October 2008, http://www.grain.org/briefings/?id=212), showing that many of these deals involved huge areas of land. What attracted attention was not just the amount of land involved or the numbers of cases, but also the logic underlying the transactions, as well as the framing of the issues and the imageries invoked. As the authors stated: "This is not land that is being primarily acquired to produce crops to sell on the world market or to feed the local population. These crops are to be sent back to the nation that has acquired the land. Using its economic clout, the investing nation is taking

* Corresponding author.
E-mail addresses: e.b.zoomers@uu.nl (A. Zoomers), gekker.alex@gmail.com (A. Gekker), m.t.schaefer@uu.nl (M.T. Schäfer).

[1] Professor of International Development Studies.
[2] PhD student at Media and Performance Studies.
[3] Assistant Professor at Media and Performance Studies.
[4] In this article we will use the term 'land grabbing'. Evidently, not all large scale land acquisitions can be labeled as 'land grabs' (many are legal, and national governments often play an active role). We use the term land grabbing, however. based on the widespread usage in the media hype, but also to indicate the discrepancy between theory and practice: that land deals *per se* may be legal (so *the fact* that these lands are being acquired), but that in the *process* of acquisition, often illegal things may happen (Kaag and Zoomers, 2014). Land deals can be legal but unfair, threatening the rights of local people: local communities were not informed properly or compensation has not been given (or not as had been promised), etc. In this sense, the process often goes at the cost of local groups who are not strong enough to protect their rights. This will be further elaborated in the article.

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over land – and, with it, the soil fertility and the water that are needed to cultivate crops – so that its people back home can have food to eat and fuel to put into their cars. It's a modern-day version of the 19th century Scramble for Africa" (http://www.grain.org/briefings/?id=212).

Following this publication, land grabbing became a fiercely debated issue and the attention rapidly evolved into a real hype[5] (Bräutigam and Zhang, 2013), attracting journalists, civil society organizations and action NGOs, as well as concerned academics, and multilateral organizations like the World Bank and the Food and Agriculture Organization (FAO) who all started to express on the issue.

Initially, the debate was organized in two camps: On the one hand, organizations such as the World Bank and investors applauded this new flow of land investments, stressing the fact that many of the "host" countries disposed of large areas of "empty" land which could be use productively for the production of food and biofuel. The investments would help (African) countries enhance economic growth; it would bring technology, employment, etc. while also contributing to solutions for the energy and food crises. Their opponents, organizations such as Via Campesina, the Oakland Institute and the UN Special Rapporteur on the right to food (until 2014, Olivier de Schutter), criticized this view by showing the many adverse effects for local communities, mostly from a human-rights perspective (e.g., de Schutter, 2009). Large-scale land investments in Africa would harm local populations who were often not informed, or displaced (also Wolford et al., 2013; Borras and Franco, 2013).

These discussions generated a 'rush' for data and empirical evidence (Oya, 2013a,b; also Scoones et al., 2013a). In the period of 2008 to present, many efforts have been made to conduct empirical research and systematize information about 'what was happening on the ground', focusing in particular on large scale land investments in food and biofuels. In addition to thousands of case studies focusing on particular cases of large scale land acquisition (academic articles, media reports, documentaries, etc.), organizations (like GRAIN) have made efforts to collect the information available and make it accessible to the public (http://www.farmlandgrab.org/). The International Land Coalition (ILC), in the spirit of open-sourced data and transparency, took the initiative to create the Land Matrix (http://landmatrix.org), a database containing information about land investments of more than 200 hectares. By creating an constantly updated database, open to the public, which includes such details as name of the investor in each deal, the total hectares involved, and the intended use of the land, they aimed at providing empirical evidence of the global land rush and generating awareness, and to help stop the global land grab. At the same time, organizations such as Oxfam Novib and Via Campesina started special campaigns (e.g., stop land grabbing now), making use of social media and Twitter. All this while various NGOs and academic scholars have contributed to a summary text about land grabbing for Wikipedia (see box); many of the research reports have become publicly accessible.

Land grab according to Wikipedia.

Box Land grabbing

From Wikipedia, the free encyclopedia (accessed 11 August 2015)

Land grabbing is the contentious issue of large-scale land acquisitions: the buying or leasing of large pieces of land in developing countries, by domestic and transnational companies, governments, and individuals. While used broadly throughout history, land grabbing as used in the 21st century primarily refers to large-scale land acquisitions following the 2007–2008 world food price crisis.[1] Obtaining water resources is usually critical to the land acquisitions, so it has also led to an associated trend of water grabbing. By prompting food security fears within the developed world and new found economic opportunities for agricultural investors, the food price crisis caused a dramatic spike in large-scale agricultural investments, primarily foreign, in the Global South for the purposes of industrial food and biofuels production. Although hailed by investors, economists, and some developing countries as a new pathway toward agricultural development, investment in land in the 21st century has been criticized by some non-governmental organizations and commentators as having negative impacts on local communities. International law is implicated when attempting to regulate these transactions.

This 'rush' for empirical evidence on the global land grab has coincided in time with the "big data" discussion (Graham and Shelton, 2013; Goodchild, 2013). Big data, used as a highly hyped term today in both academia and business, suggest that the availability of datasets of increasing volume, velocity and variety can help to better understand reality. According to Schroeder (2014), researchers' use of the internet has transformed knowledge. This transformation has taken various forms, including how scholars communicate, how they access information and how they perform their analysis (in Schroeder, 2014). Living in a self-proclaimed information era (Castells, 1992; Van Dijk, 2005) often means having access to new technologies and new types of data that offer new opportunities for research. Beyond potentially making research faster and easier, it also allows us to formulate new questions and has important implications for the methodologies employed. Rather than basing research on sampling – looking for causalities and relying on field research – this approach to big data seems to suggest that in a dataset which is large enough, the identification of correlations and subsequent acting upon them is enough. Supposedly, when one can identify such correlations, looking for causality and finding alternative intervening variables, becomes seemingly unimportant: the results speak for themselves, which might lead to "end of theory" (Anderson, 2008). Even though calling for careful examination of (big) data research as a complex material practice, involving complex assemblages of humans and non-humans (Manovich, 2006; Marres and Rogers, 2000; Rieder and Röhle, 2012; Rogers, 2002; Thatcher, 2014), many see big data as an

[5] "Hype" as a term might sound dismissive or arrogant, but this is not the authors' intent. Instead, we consider hypes as manifestation of the growing attention economy of the digital world, where (public) concentration is a limited recourse, that must be cultivated and preserved. The hype here is then builds on such concept as the issue network (Dean, 2003; Marres and Rogers, 2000; Rogers, 2002) where various (sometimes antagonistic) actors come together to promote an acknowledgment of a topic *as such*, rather than a certain point of view or stance within it. In our case, both "big data" and "land grab" are contested terms that unify massive (contradictory) public points of view and opinions, at the current juncture.

alternative (or additional) source of analysis, allowing us to raise new questions for the first time and see new patterns of (in)consistencies[6]. It also involves the danger, however, that we will become engrossed in the toolsets available to us, thus disregarding potential self-propagated hypes.

In this article, we aim to bring together these two hypes, analyzing to what extent big data will help shift the research frontier on the "global land grab" (and untangle hidden dimensions). For the purpose of this paper, we define big data as "research that is made possible by means of the capture, aggregation and manipulation of data about a given phenomenon on an unprecedented scale and scope" (Schroeder, 2014). We agree with Burkholder (1992) that "Big data not only refers to very large data sets and the tools and procedures used to manipulate and analyze them, but also to a computational turn in thought and research." Big data reframes key questions about the constitution of knowledge, the processes of research, how we engage with information, and the nature and categorization of reality (Boyd and Crawford, 2012: 665).

Until now, many of the studies on large-scale land acquisition are case-study based, focusing on the particularities of specific situations (either in the form of media reports, documentaries or academic research). Conclusions are often narrative-based and anecdotal, which will not necessarily contribute to valid generalizations. We propose looking at such cases through the prism of big data (by aggregating them to the global level) and examining the new pictures appearing through the ensuing kaleidoscope. Given the availability of huge amounts of information about the land grab debate, including new sources of big data, in combination with case study-based research results, this article aims to critically review blind spots, and – more particularly – make an assessment of the value of big data in raising new questions and formulating new hypotheses that have been overlooked in the past. What is the value of digital methods and data driven research through online platforms for identifying knowledge gaps and proposing solutions? By coming from both development and media studies perspectives, we want to find out whether we have missed important dimensions that have previously eluded researchers.

We will start by giving an overview of the land grab debate since 2007, referring to the different stages in which knowledge production has taken place. After this, we will critically review various (new) sources of big data which have become available through the internet to discover what kind of (additional) knowledge these provide. In doing so we aim to follow previous works on big data in geographical context (Crampton et al., 2013; Graham and Shelton, 2013) offering a cross-cut of methods to juxtapose the scholarly and public attention drawn to both big data and land debates, while offering a clarifying perspective on both.

- Based on Google Ngram viewer and the Google book project, we analyzed different land grab related terms going backwards in time and placing the land grab debate in a historical context.
- We analyzed the detailed information about land investments as currently available in the Land Matrix (open to the public and with information about more than 1300 land deals covering over 62 million[7] hectares – November 2015).
- We analyzed relevant websites (http://www.farmlandgrab.org/) to make a systematic analysis of who the main actors are (critical review of different stakeholders between 2009 and 2014) and how they communicate, based on the posted announcements, articles and videos.
- We performed a network analysis based on the Issue Crawler – to show how divergent the network is, who talks about what subjects (analyzing typologies of URLs, etc.) and Twitter – to track the rise and fall in certain terms and for retweets, showing the main stakeholders and how real-time information spreads among users.

Being aware that some might criticize our definition of big data (a label that according to some should be reserved for data exceeding the capacity of a normal computer) and the fact that other sources could have been included, such as search engines, and Facebook, we see this paper as an exploratory methodological piece. We hope it will be helpful in advancing the multidisciplinary exploration of data. As "[b]ig data is less about data that is big than it is about a capacity to scratch, aggregate and cross-reference large data sets" (Boyd and Crawford, 2012: 663), our goal is to query such seemingly disparate sets in the hope this helps formulate new questions and/or unravel blind spots in current research.

2. Reconstructing the debate from 2008 to present: what do we know?

At this moment, eight years after the start of the hype, a plethora of reports and newspaper articles has been published on the global land grab. 'Many of these reports contained significant errors, but were nonetheless circulated uncritically and became the foundation for data bases and later on, scholarly analyses: stories were easily accepted as conventional wisdom – and there was initially little investigation or follow-up on the initial land grab reports before they were published, becoming 'data' for others to analyse' (Bräutigam and Zhang, 2013: 1678). It became increasingly clear that it constituted a worldwide trend, with investors not only from the East (in countries such as China, South Korea, Japan, India, Saudi Arabia and the Gulf state, as was suggested in the earlier reports), but equally from the North (various European countries, Canada and the United States) and the South (Brazil, South Africa, Mauritius, etc.). In addition to foreign investors, domestic investors also play an important role, and that much of what happens take place in the form of joint ventures (the origin of which is hard to untangle).

Thanks to fact finding on the ground – we are much more knowledgeable about the volume of large scale land investments, but also about the drivers and consequences (see also Borras and Franco, 2010, 2012; Cotula et al., 2009; Cotula, 2012; Deininger and Byerlee, 2011; Evers et al., 2013; Zoomers, 2010; Kaag and Zoomers, 2014; Hall et al., 2015). It has become clear that large scale land acquisition has taken place in countries such as Ethiopia, Mozambique, Madagascar, and Tanzania, in post-conflict areas such as DRC and Sudan, but also in Southeast and Central Asia and Latin America. (Borras and Franco, 2012; also Boamah, 2014; Margulis et al., 2013). At the same time, it has also become clear that, evidently, not all large scale land acquisitions can be labeled as land 'grabs' (many are legal, and national governments often play an active role). At the same time, however, using the term 'grab' might still be justified by the fact that in many cases land deals *per se* may be legal (so the fact that these lands are being acquired), but that in the *process* of acquisition, often illegal things may happen' (Zoomers and Kaag, 2014). In other words, land deals *per se* may be legal (so *the fact* that these lands are being acquired), but in the *process* of acquisition, often illegal things are taking place (Kaag and Zoomers, 2014). Land deals are often legal but unfair, threatening the rights of local people: local communities were not informed properly or compensation has not been given (or

[6] Referring to this point of view in the special issue on "Mapping Cyberspace and Social Media" of the Cartography and GISciences Journal few of the world's leading geographers call to "to think beyond such limited analyses of the geoweb and the now-popularized, simplistic visions of big data as an atheoretical solution to understanding the spatial dimensions of everyday life that are increasingly well documented on the geoweb" (Crampton et al., 2013, 131).

[7] This number includes intended deals and failed deals.

not as had been promised), etc. In this sense, the process often goes at the cost of local groups who are not strong enough to protect their rights. In Ethiopia, for example, large scale land acquisition is legal and part of formal state policies. The land is owned by the state, and governments allocate land in favor of policy goals (which varied from economic growth – modernization and/or food security) but without respecting local rights and interests). In many host countries national governments) play active roles in attracting investors – or at least offering investors land previously held by local groups (Wolford et al., 2013; Bräutigam and Zhang, 2013). It is in a sense an outcome of intended policies (and the logical consequences of earlier donor strategies): pushing governments to create friendly business environments to attract FDI and create free land markets, seen as a sine qua non for modernization.

There is much more information about the scale of the global land rush. Focusing on large scale land investments in food and biofuel in sub-Saharan Africa, but estimates about the total affected area are highly variable: The International Food Policy Research Institute (IFPRI) estimated in 2009 that between 15 and 20 million hectares of farmland in developing countries had changed hands since 2006. The World Bank report claimed 57 million hectares worldwide; Friis and Reenberg (2010) reported between 51 and 63 million hectares in Africa alone; and the GRAIN database published in January 2012 quantified 35 million hectares, although stripping out more developed economies such as Australia, New Zealand, Poland, Russia, Ukraine and Romania reduced the amount in the GRAIN database to 25 million hectares (Wikipedia website). The Land Portal's Land Matrix data (as accessed in August 2015) now totals more than 62 million hectares of deals globally, including intended and failed deals. There is no doubt that looking at the issue globally, large-scale land investments are taking place on millions of hectares of land, especially if rapidly expanding crops like soy (Latin America) and oil palm (Indonesia, etc.) are taken into account. Empirical research has helped make it increasingly clear that by focusing on food and fuel, we are looking at the tip of the iceberg: land grabbing not only affects farm land for biofuels or crops, but also involves claims for nature conservation ("green grab", including REDD+), urbanization and infrastructure (including dam construction), as well as tourism. It has become clear that – rather than being the result of mega-deals by foreign actors – local land markets are increasingly under pressure by various pressures and competing claims with a large variety of actors involved (Kaag and Zoomers, 2014).

Focusing on the impact, there is now a growing consensus that many things go wrong. Field research has helped uncover the various problematic aspects and the complexity: Large-scale land acquisitions are going hand in hand with conflicts – empirical studies showed that developmental impacts have often been very small, and employment effects are limited (and in the cases where employment is generated, working conditions are rather poor and local populations are often bypassed). Local people are excluded and forced to move; others are included (in outgrower systems etc.), but often on highly adverse terms, leading to exploitation and poverty. Many are not consulted and residents are often displaced or enclosed (limiting their access to land, water, forests, etc.) without being informed. Furthermore, large-scale land investments often lead to "monocultivation" and go hand in hand with large environmental costs (Borras and Franco, 2010, 2012; Cotula et al., 2009; Cotula, 2012; Deininger and Byerlee, 2011; Evers et al., 2013; Zoomers, 2010; Kaag and Zoomers, 2014; Hall et al., 2015).

Acknowledging the problematic side of large-scale land acquisition, some countries (Mozambique and Argentina) have temporarily decided to have a moratorium on land acquisitions, creating a "timeout" to bring current processes under control. Policymakers and international organizations (World Bank, FAO) are nowadays actively involved in promoting "good" land governance. Even though for a long time the land issues have been taboo as a field of intervention, how to govern land issues – and how to prevent land grabbing – has become a top priority for many policymakers and practitioners working at NGOs. To the extent that attention is given to policymaking, much attention is given to institutional solutions: creating transparency is seen as top priority. Concrete efforts to improve the situation are broadly restricted to three types of policy interventions: First, efforts to improve the land legal framework and land governance (e.g. through the Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests being promoted by the FAO). Second, much attention is given to land titling administration, including the establishment of modern cadastres (and finding ways to support local population in protecting their rights, e.g., principles of Free, Prior and Informed Consent). And last, there is rapid growth of interventions in the field of making investors more responsible e.g. the Principles for Responsible Agricultural Investments (RAI), how to incorporate land issues in certification schemes, round table soy, round table oil palm, etc.).

3. Using Google Ngram viewer: traveling back in time

In current policy debates the global land rush, and land grabbing, are often presented as a *new* topic that suddenly appeared (rather unexpectedly) in response to the food and energy crisis. It is suggested that large-scale investments in land are caused by global concerns about how to feed the world and meet the increased demand for biofuels.

It is interesting, however, to travel back in time and put the ongoing land rush in a historical context (see also Edelman et al., 2013). According to some, it should be seen as "new colonialism" and as a modern version of the 19th century Scramble for Africa (GRAIN, 2008a, 2008b; Carmody, 2011), others see the current land grab as a repetition of what happened in the 1960s (modernization) and 1970s (agricultural colonization), or stress that it is the logical outcome of neoliberalism (1980s), which resulted in large-scale commoditization of nature in combination with globalization forces (foreign investments, value chains, etc.). But until now no systematic comparison has been made of the changing use and interpretation of land grabbing over time.

The first big-data tool we wish to introduce for the purpose of better understanding land grabbing as an evolving concept is the Google N-gram Viewer,[8] an aggregated service for scanning and comparing word chains (n-grams) across Google's scanned separate corpuses of 5.2 million digitized books. Using it confirms that the term land grabbing is not new: it has been used off and on at different times and at different settings.

Making a systematic analysis of the changing use of terms like "land grab" "land rush", "scramble for land" or "land robbery" takes us back as far as the early 19th century. Publications describing Europe's expansion into colonial areas in Africa, Asia and Latin America use it, often within their euro-centric and discriminatory perspective. Mark Twain, in his book *Following the Equator: A Journey Around the World* (1897) wrote on April 22: "Dear me, robbery by European Nations of each other's territories has never been a

[8] The Google Ngram Viewer is an online phrase-usage graphing tool of Google, released in 2010. It charts the yearly count of selected *n*-grams(letter combinations) or words and phrases, as found in over 5.2 million books digitizedby Google Inc(up to 2008). The words or phrases (or ngrams) are matched by case-sensitivespelling, comparing exact uppercase letters, and plotted on the graph if found in 40 or more books during each year (of the requested year-range). The word-search database was created by Google Booksand was based originally on 5.2 million books published between 1500 and 2008. Collectively, the corpus contained over 500 billion words in American English, British English, French, German, Spanish, Russian, Hebrew, and Chinese. (http://en.wikipedia.org/wiki/Google_Ngram_Viewer).

sin, is not a sin today (...). All the savage lands in the world are going to be brought under subjection to the Christian Governments of Europe. I am not sorry but glad. This coming fate might have been a calamity to those savage peoples two hundred years ago; but now it will in some cases be a benefaction. The sooner the seizure is consummated, the better for the savages. The dreary and dragging ages of bloodshed and disorder and oppression will give place to peace and order and the reign of law. (...) The savage lands of the works are to pass to alien possession, their peoples to the mercies of alien rules. Let us hope and believe that they will all benefit by the change" (pp. 323–324).

A surprising discovery however, is how the bulk of the books about land grabbing (etc.) at that time focused on the colonial wars of the American states and the settlement of the West. The rapid expansion of the frontier and the settlement of the prairies, living with "our" Indians in peace – buying up hunting grounds that previously belonged to the Indians, etc. (e.g., Clarence Monroe Burton, who in 1893 wrote about the colonial wars in the state of Michigan). Just like in the literature on colonialism, to the extent that land was taken, this was often presented as an "improvement" (and part of processes of modernization). Based on the literature, it becomes clear that at the time the topic had already evoked heated debates about corruption and whether the state could simply occupy spaces which were previously used by Indians and/or other groups of earlier occupiers. In his speech of 1858 about the battle for the constitution ("and our rights in the Union"), Hon. James H. Hammond, looking back on his role as a politician involved in taking land from local people, stated (p. 325): "When, four years ago, the Kansas and Nebraska act was passed, giving governments to those Territories, I was, like most of you, a private citizen. I was earnestly engaged in renovating old lands, and creating new out of morasses hitherto impenetrable (...). I made up my mind that this bill was fraught with delusion and trouble to the South, and so expressed myself on all suitable occasions" (*Selections from the Letters and Speeches of Hon. James H. Hammond*; speech delivered at Barnswell, October 29, 1858). In this period, the term land grab – and "great land robbery" – was also used very often in relation to the expansion of the American railroads: some were concerned about the wealth in the hands of a few railroad owners. In the *Popular Science Monthly* of March 1887 (vol. xxx:37: 582) there was a debate about whether or not the American railways were to be blamed for "grabbing land" (or its monopolistic expansion) and "bribing policy makers." Land grab by railroad companies (and taking it from local people) was justified in the opinion of some by the fact that lands had been acquired legally and large-scale investments were made (Appleton Morgan, 1887; also Brisbin, 1880).

Later on, in the 1930s and 1940s, new publications appeared, and to the extent than attention was given to land grabbing (etc.) this often focused on the (bursting of the) speculative land bubble in the US (Morton Sakolski, 1932) – or the term appeared in the context of "technical" literature about land administration (often in the context of planning). In the 1950s and 1980s, attention shifted in the direction of land reform – and acknowledgment of the need to redistribute the land – which is in many respects the opposite of what is happening today: large estates were expropriated and the land was given "to the tiller". Much was also written in this period about the process of agricultural colonization taking place in the Amazon and the consequences for (small-scale) colonists and deforestation. This was followed, in the 1980s and 1990s, by literature about land administration, land titling and the liberalization of land markets (in the context of neoliberal policies, see also de Soto, 2000). The term "land grab" was less popular than before, until the start of the new rise around 2008.

Google's Ngram viewer is a useful tool in showing the rise and fall of certain debates irrespective of the continuity of the terminology (such as land grab). Looking at the way in which the research agenda has moved, we see frequent hypes of "bubbles" (Morton Sakolski, 1932). Analyzing the use of the terms "land grab," "land rush" and "scramble for land" over time (see Table 1A) in comparison to parallel debates, it is striking to see strong connections: land grabbing has been used in literature describing theft and loss of land, but also in literature about land reform (see B) and/or concerns about land administration (see C). It also shows that certain terms should not be viewed in isolation. The land grab has been part of various simultaneous debates (with different orientations). In comparison with the large numbers of publications about land markets, land titling and land administration (as a constant topic, with a recent boom on land markets) and books about land reform (especially in the 1960s to 1980s), the number of publications with that mention land grabbing is relatively small. Even though the fact that N-google viewer analyzes only books until the start of the hype (2008) is of course one explanation (as well as the fact that most recent publications appear as journal articles and not books), it is important to consider land grabbing in context. Giving an overview of the three types of land-related discussion in combination makes us aware of the various layers in the debate, which sometimes point in opposite directions.

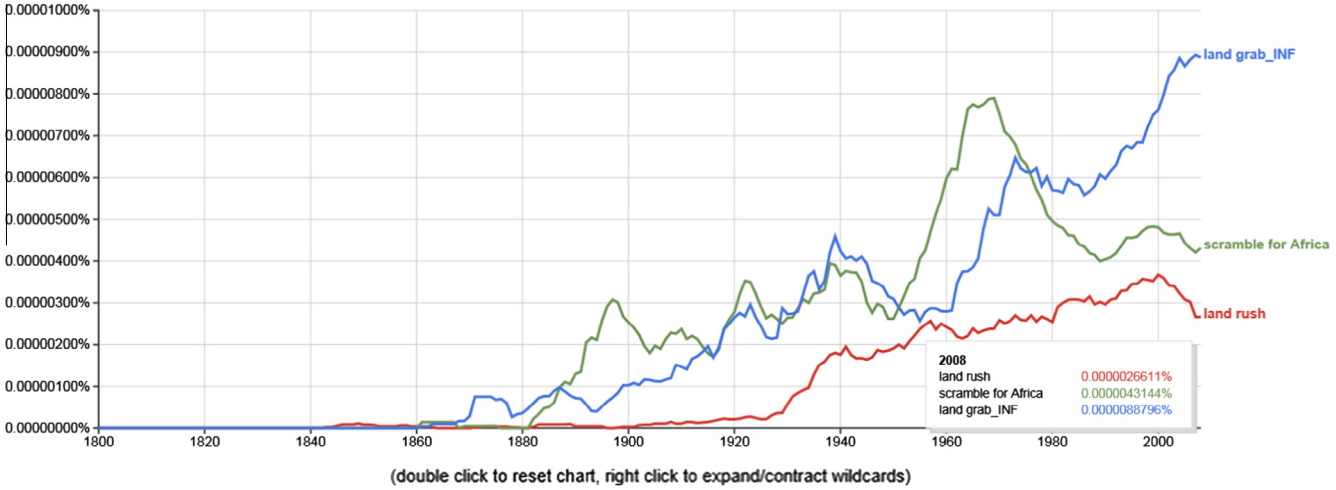
In conclusion: looking at the value of big data in understanding the land grab, it is a fact that due to the availability of digitized books, and tools such as Ngram viewer, it is easier (and less time-consuming) to analyze the boom and bust of terms and concepts, and consequently conduct potential follow up research into the historical-political realities surrounding the terms.

Much of what is happening today is surprisingly similar to what happened centuries ago. Comparing the current situation to European colonialism, and, in particular, the American Wild West (and the occupation of Indian land) helps us see how the current land rush is a continuation of old myths about empty and/or wasted lands that are only valuable as a resort for retirees and fishermen. It confirms that land grabbing is of all times. In the early 19th century, land grabbing (by the state) was as highly contested as it is today. Corruption could be found at various levels, and from the perspective of local people, a land grab by the railroad company in the 18th century was not so different from transnational companies coming in today and taking over. According to Weaver (2003), in the colonial era, "the powerful cultural ideal of improvement" legitimized European "ideas about entitlements" in taking land from indigenous peoples and claiming ownership of it. Even though the context has changed, the land rush (still) "prefigures new forms of property, such as intellectual property, and modern ideas about development that are just as likely as the land rush to have unfortunate consequences for people in the less developed parts of the world" (Weaver, 2003). The land grab should be perceived as "the formation of property rights in new world situations" (and closely related to powerful ideas about modernization and improvement). Rather than looking at the global land grab as a direct response to the unexpected food and energy crisis (as is often the case in current debates), it is (still) part of a market and ideology driven process, the "making of the modern world" (see Weaver, 2003; Carmody, 2011). The underlying discussion is about economic efficiency as reflected in volatile prices and investment rates, and the current land grab can be perceived as another stage in the colonization of the frontier (and achieving "modernization").

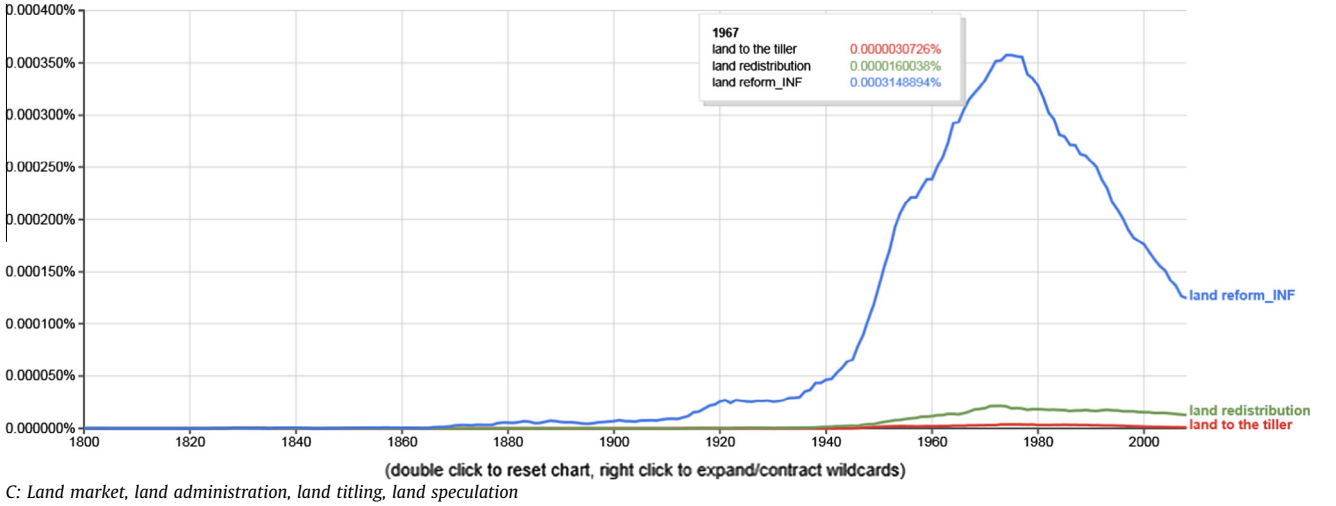
Looking at the various land-related debates shows continuities, but also underscores how ideologies and circumstances change: today's trends (giving away land to corporations) is the opposite of what happened in the 1960s during the redistributive land reforms (see B), when the land was given to the tiller. Compared to earlier periods, the current land rush is no longer the story of

Table 1
boom and bust of debates about land-related issues: Dominant debates. *Source:* Google Ngram viewer results for terms such as land grabbing, land reform and land titling (see below for summary).

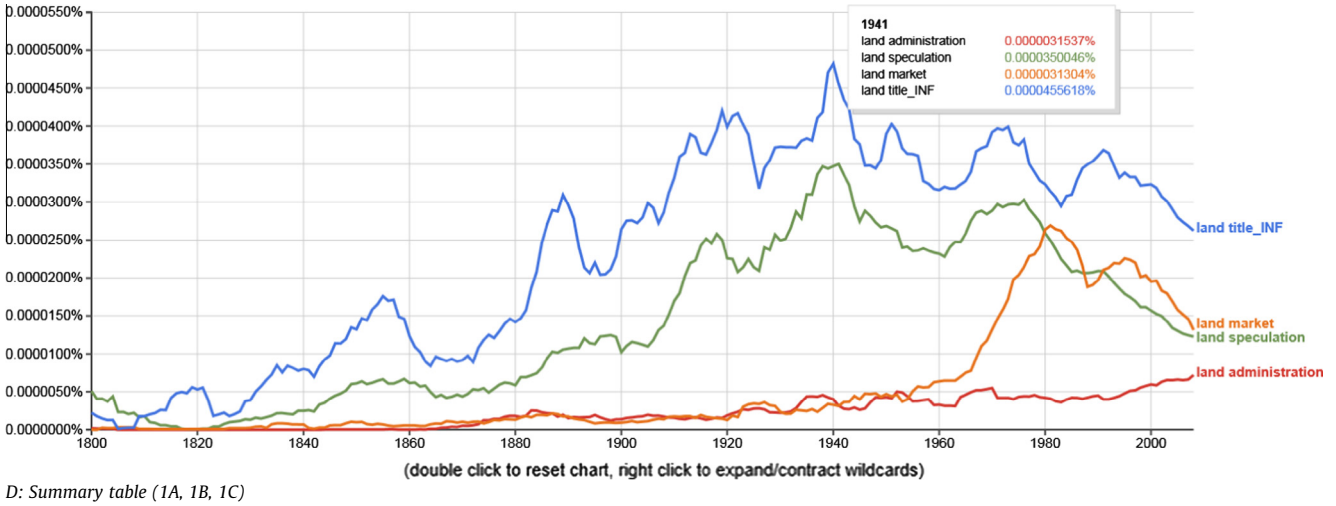
A: land grab, scramble for Africa, land rush



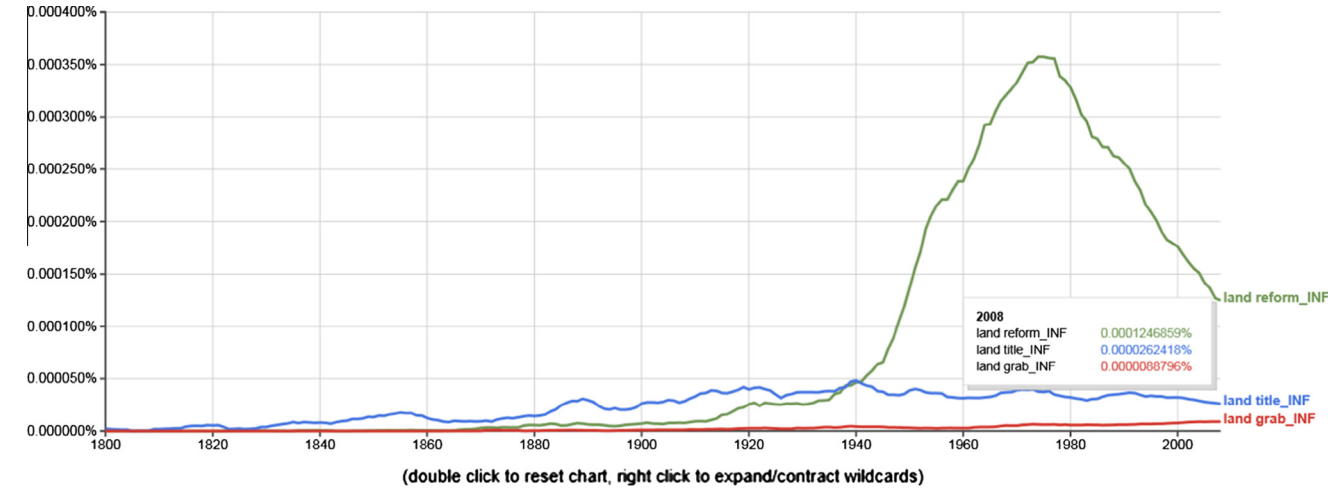
B: land reform, land redistribution, land to the tiller



C: Land market, land administration, land titling, land speculation



D: Summary table (1A, 1B, 1C)



the shifting frontier going hand in hand with the creation of great migration and new settlements: Now, investments are mainly made by corporations introducing no-tillage technology (in the case of soy) while emptying the frontier (labor-extensive monocrop production)! Another difference is that nowadays land is increasingly presented as a "global good", necessary to supply sufficient food and energy on a world scale, and that more importance is given to environmental issues than before. At the same time, due to use of the internet, NGOs and local people have a more powerful voice than ever before – and the modern cowboys and bonanza firms are increasingly bound to 'codes of conduct' and global regulations; their actions are increasingly globally visible and easier to monitor.

4. Big data: reviewing the land deals

From the start, discussions about the global land rush and land grabbing focused on finding out exactly how much land was involved and the origin of the investors. It was in this context, i.e., the need for more empirical evidence, that the Land Coalition took the initiative to build an online public database on land deals, the Land Matrix (www.landmatrix.nl):

> The Land Matrix is a global and independent land monitoring initiative that promotes transparency and accountability in decisions over land and investment. This website is our Global Observatory – an open tool for collecting and visualizing information about large-scale land acquisitions. The data represented here is constantly evolving; to make this resource more accurate and comprehensive, we encourage your participation.

In the Global Observatory, a land deal is referred to as an intended, concluded or failed attempt to acquire land through purchase, lease or concession that meets the following criteria: Deals must entail a transfer of rights to use, control or ownership of land through sale, lease or concession; have been initiated since the year 2000; cover an area of 200 hectares or more; and imply the potential conversion of land from smallholder production, local community use or important ecosystem service provision to commercial use (http://landmatrix.org/). The Land Matrix and the Global Observatory includes deals that are made for agricultural production, timber extraction, carbon trading, industry, renewable energy production, conservation and tourism in low- and middle-income countries. Records are derived from a variety of sources, including research papers and policy reports by international and local organisations and NGOs; personal information contributed through the Global Observatory website; field-based research projects; official government records; company websites and media reports.

According to the Land Matrix, there are currently (as of 15 November 2015) 1081 *concluded* deals covering a total area of 38,932,725 hectares worldwide, with 200 *intended* deals covering an additional area of 16,848,466 hectares (and 90 failed deals covering 6,488,529 hectares). After their start (and being criticized for duplications and inconsistencies, and using unreliable information) they are now rather strict before including new data. The information is available as a database, but the website is also very much aimed at "visualizing data" by offering users the option of seeing the information on maps (circles representing the number of investors, origin of capital, area of land involved per country) or in the form of flow-charts and visualizations (see below for the example of Ethiopia) (see Map 1).

In this section we present a number of critical observations on the Land Matrix platform and how it might draw our attention away from the core issues surrounding land grabbing (see also the debate between Rulli and D'Odorico, 2013; Scoones et al., 2013b). According to Oya (2013a,b) there are serious problems with the data published in the land matrix which cannot be regarded as referring to 'facts': 'By combining different sources with very different degrees of reliability and verifiability, large-scale 'land grab' data bases fall into the trap of mixing apples with bananas, driven by a willingness to report as much as possible as quickly as possible in the spirit of transparency and crowdsourcing' (Oya, 2013a,b: 506). "Unfortunately, researchers and reporters fail to recognize that the 'data' in these databases are fluid, imprecise and subject to change after verification" (Oya, 2013a,b: 508; also Scoones et al., 2013a,b; Edelman, 2013). In addition to these problems of lack of reliable data, false precision and "messy hectares" (Edelman, 2013:491), there are other reasons why the land matrix will easily lead to misleading conclusions, specifically:

1. Providing a list of people investing in land ("more than 200 hectares") will not help target problem areas: acquiring 200 hectares of land in the huge Gran Chaco region in Paraguay and Argentina cannot of course be compared with acquiring 200 hectares in a densely populated country like Rwanda or

Map 1. Land deals and investment flows (Land Matrix).

Cambodia. The ambition of building a global database raises questions about how to define land grabbing and the smallest piece of information that we can use to better understand the root causes and assess the implications.

2. The information is not linked to certain geographical circumstances that make investment problematic (or not): it would be useful to link this information to spatial data – allowing for making a better assessment of where land investments are more problematic (in peat lands, forest areas, etc.) and where not; also taking into account the type of land conversion taking place (conversion from food crop/forest into fields of soy is more problematic than from monocrop to monocrop) (Borras and Franco, 2012).
3. There are alternative sources of information that give a more direct indication of the problems involved, like information about land conflicts and/or how many people are displaced. If the database is aimed at facilitating monitoring of large-scale land acquisitions with the goal to alert, etc., such alternative indicators should be used/are more effective.

According to Edelman (2013: 488) 'The fetishization of the hectare – or really, of large quantities of hectares or even of square miles – as the most important defining characteristic of land grabbing is fraught with conceptual problems and leads researchers and activists to ignore other, arguably more significant, issues of scale, such as capital applied to the land, the control of the supply chains and the labor relations grounded or brought into being on those hectares'. In addition, and given the emphasis that this website places on visualization, we also doubt whether the type of visualizations used are helpful in untangling the problem. Whereas the information is "bundled" in circles per country, the reality is different, as investments usually go into restricted and very particular areas. In some of the cases, investors have a strong preference for fertile areas (with sufficient water for irrigation and close to airports); in other cases investment flows into "empty areas" (pastureland, often used by smallholders in nearby areas). In countries like Ethiopia, large-scale land investments are concentrated in specific lowland areas (rather than the entire country), even though small investors (such as flower growers) generally concentrate in areas with good airport or harbor access. Investments are spatially concentrated and impacts are very local (which is not reflected in the database). In the Land Matrix, information about land investment is visualized without taking into account the characteristics of the destination areas (peat land, forests, pasturelands – high population density) with the consequence that (based on the circles in the map) attention is geared toward (the wrong) level of analysis (and might direct us to the wrong places). Comparing the Land Matrix with other initiatives (e.g., http://www.ejolt.org), the Land Matrix is limited in that it does not provide additional layers of information.

Finally, another example of how visualization might prove misleading has to do with the origin of capital display (the use of arrows, linking countries of origin with the host countries). These arrows suggest transnational relations, as if the capital goes from A to B. In reality however, much of the capital involved might not flow in space; it might originate from the "local diaspora" (Indians who have lived in Ethiopia for a long time investing in agriculture) or is mobilized in the context of transnational corporations. The way it is visualized does not provide a realistic picture of the local situation (often joint ventures between various parties at the same time).

In conclusion: the Land Matrix, which was supposed to be a global source of neutral data helping to bring some transparency, provides useful information, but is – by focusing on numbers to such a degree – creating misperceptions and (unintentionally) diverting attention from the real issues. The challenge is to contextualize data in such a way that the real problems (displacement, environmental problems, corruption, etc.) become more visible. This ties in with the general trend we have found in our exploration of data: as tabular data are translated into visually appealing streams of information, the things transcribed are the quantifiable (and available) datasets, which often leaves out the less quantifiable, contextualized and scarce facts, such as the nature of the crops, the immediate vs. long-term impact on the local communities, the utilization of generated monetary (and other) benefits to the benefit of the local population, etc. This issue becomes increasingly clear as we move to examine the actors involved in utilizing these data.

5. Using the Issue crawler: who are the actors and do they communicate?

In media studies, the investigation of websites, blogs, online platforms and other social media as channels for communicating issues and sharing information concerning a specific topic has been described as "mapping issue networks" (Marres, 2006; Marres and Rogers, 2000; Rogers, 2002). While searching for information about the main actors and events, we analyzed www.farmlandgrab.org, one of the most comprehensive and open websites, which contains reports about landgrabbing and documentaries. According to this website, the information "is updated daily, with all posts entered according to their original publication date." "Its purpose is to serve as a resource for those interested in monitoring and researching the issue/[land grabbing], particularly social activists, non-governmental organisations and journalists", but also policy makers and academics (www.farmlandgrab.org).

Analyzing the announcements posted on this website between 2007 and 2014 helped to identify various subcategories of actors who – each of them – organize special events while having their own networks. Policy makers, practitioners and academics meet during annual Conferences (in Washington at the World Bank; in Rome at the FAO or IFAD; or Brussels at the EU). Businesspeople and the financial sector meet during annual agri-business events in New York and London, and also in Singapore, Abu Dhabi, etc.) in order to explore business opportunities and make new deals (see Box, Global AgInvesting). NGOs and activists are active in campaigning and/or organizing all kinds of events focusing on awareness raising (launching video and organizing public lectures, in cities such as Paris and Brussels) and/or lobbying at particular business and policy events. Academics play their own roles in organizing academic conferences and publishing their work in academic journals (*Journal of Peasant Studies*) which are increasingly available on the web (see, e.g., www.landgrabbing.org, www.iied.uk, www.landgovernance.org).

Box Africa: Saudi Agriculture Minister Enticed by African Land.

June 18, 2012

Oil, oil everywhere and not a drop to drink. . .. Saudi Arabia has vast supplies of oil but lacks something even more important; water to irrigate crops for food. With food prices soaring and water levels dropping, the Saudi government created a long term initiative called the King Abdullah Initiative (see http://www.aawsat.net/2013/11/article55322394) which establishes agricultural investments in foreign countries to produce wheat, barley, rice, corn, sugar, green fodders and animal stock. In order to save their water supply the Saudi government has made the bold decision to fade out relying on domestic wheat by the year 2016. Part of the initiative is the government facilitation of foreign agricultural investments for Saudi private sector companies. Most of the private sector companies favor investing in Africa as it is the closest viable geographic area to provide food to Saudi Arabia. (. . .) There are hurdles to be faced but (. . .) for Africa it is a transition and will take time.

From the website of AgInvesting http://www.globalaginvesting.com/news/NewsListDetail?contentid=1402

Searching for the networks between these actors – and how these stakeholders communicate – and developing new hypotheses about the link between big data and the land grab hype, we turned to Issue Crawler (https://www.issuecrawler.net), a tool that analyzes the co-occurrence of hyperlinks in a set of websites. Similarly to the way that Google PageRank assigns value to domains by counting incoming links to a certain website, Issue Crawler maps hyperlink connections between different websites in order to reveal an issue's network. After making a selection of 15 websites,[9] we conducted a co-link analysis to harvest the outgoing links and better understand who is behind the land grab debate: the Issue Crawler (crawl initiated at 19 March 2014) returned with a network of 100 different URLs, hosting a total of 9790 outgoing links. Twitter appears as the most prominent node as social media widgets (e.g. Share buttons, Twitter buttons) are widely used on websites. However, Twitter as most prominent node in the issue crawler network must not be overestimated, as it results mostly from the fact that a large number of website by default link to Twitter through their 'sharing' features[10].

Looking at the network, we see a clear distinction between three groups (see Fig. 1: i.e. the closer the nodes are coupled together, the more links they share; the more the nodes are centered, the more the overall number of hosts link to them).

On the one hand (in the center right), we see a tight network with many mutual links centered around the World Bank and various UN organizations, including the UN Development Program (UNDP.org), United Nations Population Fund (UNFPA.org), UN Women (UNwomen.org), Food and Agriculture Organization (FAO.org), and United Nations Environment Programme (UNEP.org); as well as the UN media organization IRRIN News and various donor organizations (such as USAID and DFID).

On the other hand (at the upper left), we see a majority of NGOs and activist organizations that not only have fewer links but are also shared less often by the overall population of hosts. The Oakland Institute is clearly visible in our issue network and is also one of the most avid participants in the Twitter conversations on land grabbing.

FAO and IFAD, as well as IIED, GIZ and OXFAM, appear as intermediary groups (linking to the two sides). This has been institutionalized in multistakeholder platforms such as the Committee on World Food Security and Nutrition (CFS), representing both Civil Society Mechanism (CSM, mostly opponents of large scale land deals) and Private Sector Mechanisms (PSM, corporate actors that advocate 'Responsible Agricultural Investment'). It is striking to see, however, that the business community, as well as and organizations in the South, do not appear in this analysis of website linkages. In addition, also the academic world remains rather invisible (the only exception being the International Institute for Environment and Development (IIED)). Academic platforms such as the Land Politics Initiative (LPDI, hosted by ISS) and the Academy on Land Governance for Equitable and Sustainable Development Land academy (LANDac, hosted by Utrecht University), do not appear in our network analysis, in spite of playing active roles in conducting research projects, issuing small grants, and organizing conferences: Both were not identified in our network analysis due to not having

[9] Starting points of issue crawler: http://farmlandgrab.org, http://landgrab.info, http://landportal.info, http://povertyandconservation.info, http://www.actionaid.org/2012/10/landgrabbingourwayhunger, http://www.commercialpressuresonland.org, http://www.datajournalist.it/la, http://www.fao.org, http://www.foei.org, http://www.globalpolicy.org/socialandeconomicpolicy/worldhunger/landownershipandhunger.html, http://www.grain.org, http://www.landinuganda.org/landgrabbingnrc.htm, http://www.landcoalition.org, http://www.landmatrix.org, https://www.facebook.com/stop.land.grabbing.

[10] A second crawl excluding Twitter produced a similar network, with the exception that now FAO.org as center of the issue network was identified.

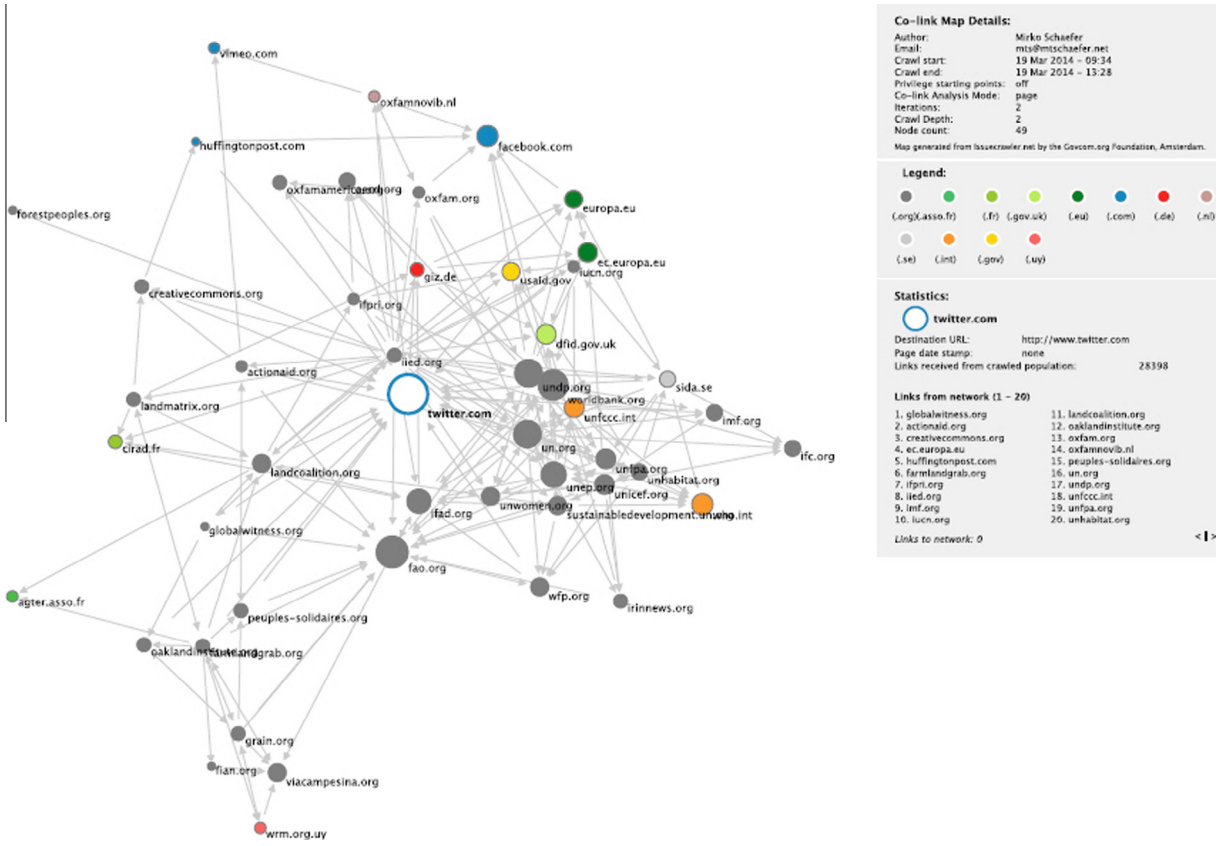


Fig. 1. Issue network (co-link analysis) of websites dealing with the issue of land grabbing and/or acquisitions (data crawl and map are generated with the Issue Crawler <http://www.issuecrawler.net>).

their own websites (i.e., both hosted by www.iss.nl and www.uu.nl, respectively) and relying on gmail-accounts.

It is interesting to confirm that the number of institutions involved in the land grab debate is rather limited and that linkages are divided between two camps. This permits a hypothesis on the perceived fragmentation between two groups (formal institutions vs. activists), who seem to be talking *to* each-other rather than *with* each other. A cursory examination of the types of events referenced in each case (see section below for complementary Twitter analysis) supports this assumption. The activist community congeals around specific painful issues, regardless of their location and origin. The formal institutions are centered around specific yearly events that take place constantly and involve the business sector.

6. Twitter and Facebook: new digital highways?

Social media (such as Twitter and Facebook) play important roles as channels for sharing information, also in the issue network on land grabbing. While analyzing the impact of big data in the land grab debate, we decided to analyze Twitter. In order to indicate the extent to which land grab is part of Twitter conversations, we screened Twitter (twitter.com) twice for 24 h (on Saturday, 29/30 March and 2/3 April 2014), followed by snap samples (using www.tweetarchivist.com) on 8 May and 11 August 2014. In this analysis we used the following search terms: landgrabbing, land grabbing, landgrab, land grab, landdevelopment, land development, landacquisition, land acquisition, landmatrix, land matrix, landdeals and land deals. The data from day 1 is monitored from Saturday, 29 March 1 pm until Sunday, 30 March, 1 pm, day 2 consists of data from between Wednesday, 2 April, 11 pm and Thursday, 3 April, 11 pm. In addition, we did an additional analysis on August 11 and 12, 1 pm (using www.tweetarchivist.com), and 8–11 August dispersed over the day.

Although these samples are small, they show some interesting patterns and confirm insights that have been gathered in earlier research on Twitter conversations (Java and Finin, 2015). Twitter conversations often revolve around an actual event. In our case on 19 March, "landgrab" appeared in tweets on activities unfolding in India, where a new land acquisition bill allegedly threatened farmers. The most active users in our first 24 h sample of Twitter were sending messages relating to events in India. Looking at the word cloud of most frequently used words, issues unfolding on this first day are caught in key words such as "gujarat", "hooda" and "vadra" (and the most frequently shared link in the first sample was a news video reporting on the protests of farmers in Gujarat ("Angry protest by Gujarat farmers against land acquisition" on YouTube), which received 51 retweets (on YouTube the video had over 16,000 views as of 9 April).[11] The following day, however, news had already moved in the direction of other cases. Analyzing Twitter on August 11 shows Israel and Kambi as topwords.

The former related to the referenced land grabbing in Gaza; the latter had to do with a scandal in Kenya after former Lands Minister James Orengo mentioned Cabinet Secretary Kazungu Kambi in a list of 1000 alleged land grabbers. "Kambi says the courts heard the matter found him without blame. He says the ethics and anti-

[11] Top 3 Twitters: https://twitter.com/Premprakash198 (27) (India) (Political); https://twitter.com/Sandeep1210456 (23) (India) (Political); https://twitter.com/acharyiManoj (17) (India) (Political).

Table 2
Twitter: meeting place for opposing groups. *Source:* Tweet Archivist, 8/4/2014–8/11/2014 Date Range.

Vacant land for sale in Africa (81 tweets)	**land grabbing in Africa** (38 tweets)7 tweets
25,539 impressions	51,726 impressions
top words	**top words**
vacant 73, south 73, zar 73,000 30, property 14, bay 14, *kenya* 13, southafrica 11, wavecrest 10	**issue 14, *kenya* 14, kambi 10, against 7, spree 6, sierraleone 6, meets 6, opposition: 6, citizens 6, declaration 6, landgrabbing 6, agribusiness 6, "displacement 6, faces" 6, empowered 5, africa: 5**
jeffreys 10, road 6, estate 6, plots 5, cape 5, town 5, via 5, ethiopia 4	**denies 5, allegations: 5**
Hashtags	**Hashtags**
#property 14, *#kenya 13,* #southafrica 11, *#africa 7* *#ethiopia 3*, #freeethiopia 3,#selamlehagerashin 3, #freezone9bloggers 3, #ginbot7 3, #anonymous 3 #auction 1, #ethiopians 1, #humanrights 1, #agriculture 1, #landgrab 1, #gamefarm 1, #adverts	*#africa 18, #kenya 8,*#sierraleone 6, #landgrabbing 6, *#etiopia 2*, #landgrabs 2, #nakuru 1, #landacquisition 1, #colonialismo 1, #land 1
Examples of Users	**Examples of Users**
– GOSAfricaDaily (53x): South Africa on Watching: brings the latest national and state news & video to you real-time.	– *hashtagafric 3: photos and videos*
	– TheSpeakerMedia 2: The Speaker News Media
	– GetItAl 2 Get All the latest updates Around the Globe here
– vofnsouthafrica (11x): History & Current Affairs On South Africa.	– urbanchinafrica 1 THE AFRICA-CHINA URBAN INITIATIVE brings together expertise about the unique urban planning linkages between Africa and China
– junkmailkenya (10x): Happenings at the Junk Mail Publishing Group in Kenya	– IDMC: Global leaders in the monitoring and analysis of people forced to flee worldwide. Tweets on at-risk and uprooted peoples
– JawitzProp (4x): Jawitz Properties is a leading real estate company operating in South Africa and Mauritius	– TerraProjectNet 1: TerraProject Photographers is an Italian collective of documentary photographers founded in Florence in 2006
– PropertyBuyerUK (3x): Helping People Connect When Selling Their Property	– DennisMbugua2 1: Land Economist, Land Administrator & Surveyor, Chair LAM Surveyors ISK, MISK, A Passionate Land Governance, Rights and Issues Scholar, University of Nairobi
– GetItAl (2x): Get All the latest updates Around the Globe here	– landcoalition 1: International Land Coalition (ILC) is a global alliance of CSOs and IGOs working to promote secure access to and control over land for poor women and men
– *hashtagafric (2x):foto's and video's*	– JohannaKlos: working on the Horn of Africa region and Yemen @IDMC_Geneva of the Norwegian Refugee Council
– rudikruger1969 (1x):Real Estate Entrepreneur Real Estate Investor	– NRC_Norway 1: Independent humanitarian NGO, providing assistance and protection to refugees and internally displaced people
– GameOnTx 1: Golf & Tennis Performance Specialist (1x)	

corruption commission also cleared him" (http://ntv.nation.co.ke/news2/topheadlines/kambi-tells-orengo-to-carry-his-own-cross/). This was followed by a flow of tweets discussing whether (or not) Orengo "could ride this land grabbing wave" (the pot calling the kettle black) and whether (or not) he is the right person to "really enlighten citizenry about land thievery". In all the cases we see a mix of topics and opinions coming from different sides. The bulk of messages are retweets (content, the variety of ideas spread through Twitter is relatively small and messages travel relatively short distances);(local issues are discussed by local people). Particularly messages that refer to longer texts and videos seem to travel longer distances. In order to show how Twitter is simultaneously used by groups with opposite goals, we searched Twitter for "#-land grabbing in Africa" (retrieving mostly tweets opposing the land grab) and "vacant land for sale in Africa" (often tweets by brokers trying to find buyers) on the other hand. We found the following results, showing that while Twitter is used by activists trying to "stop land grabbing", it is also used by "their enemies" who are buying the land (see Table 2).

In conclusion, Twitter helps to trace important events and facilitates communication, even though the term "land grab" is used for various things (from local land conflicts in Africa to Putin's role in occupying Ukraine). On Twitter, it is not clear who is who, and communication often does not exceed people's own circles. Some users have multiple accounts, and some accounts are used by multiple people. Some people never establish an account, and simply access Twitter via the web (see Boyd and Crawford, 2012: 669). In addition, it is not possible to use Twitter as an indication of social networks: "Yet, the relations displayed through social media are not necessarily equivalent to the sociograms and kinship networks that sociologists and anthropologists have been investigating since the 1930s" (ibid: 670). Rather than providing hard data or empirical evidence, Twitter has helped to spread the word and in generating awareness. It has helped to draw attention to the discussed issues and inform a wider, general audience.

7. Conclusion

Analyzing the extent to which data has helped untangle hidden dimensions about the global land rush and land grabbing, it is without a doubt that the internet (and the mediagenic framing of the issues) has been of crucial importance for pushing the debate and bringing the issue to the top of policy agendas. The internet played a crucial role in "creating a hype", which was helpful in highlighting the problematic dimension of large-scale investments, and helping local organizations bring rural issues (neglected for more than 20 years) back to the center of policy attention. Thanks to the internet, local organizations were able to link to each other, going beyond the grassroots level. It is also due to the web (and the pressure exerted by NGOs) that international organizations started to act; the business community, trying to reduce risks (and alarmed after some scandals), is currently giving more priority to sustainable land use and responsible business. Big data and the digital turn – social media, crowd mapping, open data, etc. (Goodchild and Glennon, 2010) – might help make government more transparent and accountable – and hold modern cowboys and bonanza firms responsible.

Our analysis has shown that the use of big data and digital methods can help studying social and cultural processes and dynamics in new ways: it is easier than before to study linkages and networks while following the imagination, opinion, ideas and feelings of hundreds of millions of people. In addition, it helps making analysis more convenient and less time consuming. Data tools makes research easier ("historically speaking, collecting data has been hard, time consuming, and resource-intensive", Boyd and

Crawford, 2012: 673) and provides opportunities to see new dimensions that until now have remained rather invisible. As shown, for example, with the Ngram viewer inquiry, we have new opportunities to "travel back in time" and look at what is happening at various places simultaneously (making it is easier than before to see the *translocal* dimensions of development). The mushrooming of information on the web allows for a better comparative research, which raises new questions about "how to compare apples and oranges" and asking ourselves why do the outcomes of the global land grab – in spite of huge differences in the context of time and place – are surprisingly the same.

At the same time, however, using big data as the sole or primary information and focusing on "pure" quantification ("how many hectares") will lead to wrong and misplaced conclusions. 'The rapidity of easy access to 'data' and the dangerous allure of Google have facilitated the recycling of facts long after their sell-by data' (Scoones et al., 2013a: 473). As critical inquiry into the very nature of modern web platform has shown, quantification stands at the very heart of it, driven both by the underlying database structures of the modern websites, as well as by the users' desired for clear metrics as form as assessment and feedback (Grosser, 2014). It is then of no surprise to see similar metrics-driven compulsion in the land grab debate. As Edelman warns, "The almost obsessive focus on hectares, while no doubt effective in attracting the attention of major media, foundations, policy makers and civil society organizations, leads analysts to downplay other dynamics and to assume a commensurability that is likely spurious" (Edelman, 2013:497) which in turn relies on inclusion of preliminary, anecdotal, unverified and moribund cases in databases and published reports which then, inevitably, appear to be 'written in stone' [and] 'the aggregation of dissimilar and sometimes faulty data followed by the trumpeting of ever larger, increasingly alarming totals of hectares grabbed" (Edelman, 2013:497).

This can further easily lead to misinterpretations and false knowledge as "A methodological discussion of evidence on 'land grabs' should go beyond the big numbers and large data sets and attempts a broader critical discussion of what is being reported, published and on the basis of what sources and methods" (Oya, 2013a,b: 504). Our analysis shows the need to critically rethink what kind of indicators are relevant (conflicts, displacement?) and the smallest piece of information that we can use as an indicator of land grabbing. The Land Matrix – and the visualization of land grabbing – easily steers us in the wrong direction. "A data set may have millions of pieces of data, but this does not mean it is random or representative" (Boyd and Crawford, 2012: 668), while "Raw data is both an oxymoron and a bad idea. On the contrary, data should be cooked with care" (Bowker, 2005, pp. 183–184; ibid: 663).

Mapping local data in global maps will easily create misperceptions and are not necessarily helpful in targeting the hotspots. In order to be able to monitor current trends, and be able to assess the human and environmental implications, it might be more functional to use criteria such as numbers of displaced people (in relation to investment patterns), while also taking into account the chains of effects that this will generate. Or, alternatively, monitor (undesired) change in land use by using spatial data (deforestation in relation to new investments made, correlations with fires, etc.). Using big data without making efforts to put numbers into context will lead to misinterpretations of current trends (see also Eck, 2012; Scoones et al., 2013a,b). Numbers do not speak for themselves and "it is increasingly important to recognize the value of small data" (Boyd and Crawford, 2012: 670). Producing a database that contains information about investors might be interesting, but visualizing their presence as total numbers per country – or presenting investment flows as arrows between countries – is not in line with reality, which is much more translocal instead of transnational (Zoomers and van Westen, 2011).

In conclusion, big data and the digital turn offer new opportunities to study new trends (such as the rapid increase of large scale land investments in the global South). Possibly, the largest challenge (for researchers) is to not become overwhelmed – maintain distance from hypes – while making more efforts than ever to look at the quality – and reliability – of information. Due to the availability of big and open data, there is a need to resist fetishization of the quantified hectare and critically rethink how to make a selection of information is academically sound, representative and/or reliable. Increasingly "professional journalists rub shoulders with bloggers, academics, pressure groups and media professionals in an increasingly transparent and connected world" (Schroeder, 2014). Today, we have massive databases of materials in the form of books, newspapers, data about land deals, websites and videos. However, those sources are not equal, and – as the Land Matrix case shows – often channel their participants into discussing the types of data that are easily aggregated and analyzed by the same methods that we employ. Lacking complex (and often expensive) tools that automatically mine free text, images or videos, tabular geo-data is the go-to source for contextualizing the debate. And when turning rows of numbers into maps or arguments, we must be vigilant to be "concerned as much by the procedure to detect the relevant parties as to the methods to bring into the center of the debate the proof of what it is to be debated" (Latour, 2005, 8). Together with Scoones et al. (2013b) we are worried about the uncritical deployment of data and the fixation on "killer facts" and in favor of 'concrete, situated and transparent research that could address critical questions such as what is actually happening, who is winning and losing and why' (Scoones et al., 2013b; also Cotula, 2014). While learning from virtual space and data-sets, keep doing empirical research ' on the ground' is a sine qua non for seeing the real issues and making sensible interpretations. In many cases, there is a discrepancy between what is reported (big data), what is real and what is important.

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