WORKING PAPERS SERIES NR. 8

Adaption und Kreativität in
Afrika – Technologien und Bedeutungen in der
Produktion von Ordnung und Unordnung

Florian Weisser

POWERFUL, METAMORPHIC, MEDIATIVE: TREES, CLIMATE CHANGE AND THE INTRICATE GEOGRAPHIES OF OBJECTS

DFG

Gefördert von der DFG

Florian Weisser

Powerful, metamorphic, mediative: Trees, climate change and the intricate geographies of objects

Working Papers of the Priority Programme 1448 of the German Research Foundation
Adaptation and Creativity in Africa: technologies and significations in the making of order and disorder

Edited by Ulf Engel and Richard Rottenburg

Nr. 8, Leipzig and Halle 2014.

Contact:

Richard Rottenburg (Co-Spokesperson)
DFG Priority Programme 1448
Adaptation and Creativity in Africa

University of Halle
Social Anthropology

Reichardtstraße 11
D-06114 Halle

Ulf Engel (Co-Spokesperson)
DFG Priority Programme 1448
Adaptation and Creativity in Africa

University of Leipzig
Centre for Area Studies

Thomaskirchhof 20
D-04109 Leipzig

Phone: +49 / (0)341 973 02 65
e-mail: info@spp1448.de

Powerful, metamorphic, mediative: Trees, climate change and the intricate geographies of objects

Florian Weisser

University of Bonn, SPP 1448, Project "Translations of the ´Adaptation to Climate Change´ Paradigm in Eastern Africa" (Associate)

CONTENT

Abstract

This paper unpacks the intricate geographies of trees in the current fight against climate change. Through a multi-sited ethnography of forestry programming in Uganda, I explore how trees are entangled in different worlds ranging from global donor paradigms and scientific realisms of climate change to vernacular cosmologies and life worlds. Denaturalising trees as taken-for-granted elements in current environmental governance, I trace trees' various reincarnations the praxis of development projects, show how they matter to Ugandan post-colonial politics and nation building and examine how they link up otherwise different rationalities. In doing so, I advance the current debate on object-oriented geographies. By marrying object-oriented philosophies and their adoption in geography with post-ANT writings, I present three ways in which objects are related to the world: powerful, metamorphic and mediative. This approach does not put ANT-inspired thinking at odds with 'pure' object-oriented philosophy but opens up space for future geographical inquiry. To do so, however, I argue that we need to be more precise with regard to what kinds of objects we actually envisage.

Introduction

Between 2000 and 2010, the world lost 130 million hectares of forest. This is equivalent to the area of Peru, or California and Texas together. Replantation and natural forest expansion in the same period add up to 78 million hectares, which, on balance, makes an average net loss of 5.2 million hectares per year between 2000 and 2010 (Food and Agriculture Organization of the United Nations 2012), an area that equals the territory of Switzerland. This calculation does not take into account the fact that replanted forests are not tantamount to woodlands that have been developed over thousands of years in terms of biodiversity and biomass. Against this backdrop, deforestation has been claimed to be a 'matter of humanitarian concern' for decades (Williams 1989, 197; critically, Ribot 1999; Li 2007). More recently, this 'ecology of fear' (Davis 1999) has been coupled with the looming catastrophe of climate change (Hulme 2008; Swyngedouw 2010), resulting in an unprecedented boom of reforestation. In fact, reforestation is seen not only as compensating for loss through deforestation, but also as a means of promoting development, sustainability and economic growth, and even offering an opportunity to reconcile the three (Escobar 1996). The UN-REDD programme (Fletcher and Breitling 2012; Lin, Sills, and Cheshire 2014; Gallemore and Munroe 2013), as part of the payments-for-ecosystem-service programmes more generally (Shapiro-Garza 2013; McElwee 2012; Martin et al. 2013), is emblematic of this alliance, which was introduced into the international climate change regime at the Conference of the Parties (COP) 2005 in Montreal, when Costa Rica and Papua New Guinea put the issue on the COP agenda. More recent ecosystem-based adaptation programmes, such as those promoted by the United Nations Environment Programme, the United Nations Development Programme and the International Union for the Conservation of Nature, also promise to accommodate environmental protection and economic development (Munang et al. 2013). For mitigating and adapting to what is widely perceived as 'the most urgent environmental problem of our time' (Crist 2007), forests have most important things to offer: their ability to sequestrate carbon dioxide, to cool the global climate by transforming the sun's rays into water vapour, or to reduce many of the effects of an already changing climate, such as soil erosion by surface water run-off due to changes in precipitation regimes.

This article seeks to interrogate forestry programming in development praxis. It does so against the backdrop of an intensifying debate on climate change in the Global South (Weisser et al. 2014). The particular case presented in this paper concerns a Ugandan non-governmental organisation's endeavour to re-green the country by planting trees. Over decades trees have vanished, been burned for charcoal, used as timber for construction, or cut down to make way for arable land. Between 1990 and 2010 the forested area has decreased from 4.75 to 2.99 million hectares. That accounts for an annual deforestation rate of around 2.5 per cent or a loss of 35 per cent of Uganda's total forest coverage as related to 1990 (Food and Agriculture Organization of the United Nations 2011, 2012). The consequences are dire: soil erosion and landslides on the bare slopes of the Mount Elgon volcano on the border with Kenya, which have killed hundreds of people in the last couple of years; an energy crisis forcing the rural population to spend a good part of the day collecting firewood, and making charcoal more and more unaffordable for city dwellers; ecological consequences such as loss of biodiversity, to mention just a few.

Forests are by no means a new issue for Political Ecology. Forestry has been scrutinised from different perspectives, ranging from political economy, discourse theory or governmentality to assemblage thinking (Baldwin 2009; Bonta 2005; Braun 2002; Li 2007; Müller 2011; Valve

2011). This paper, in contrast, seeks to test an object-oriented perspective by bringing the tree centre-stage. Inspired by the recent speculative turn in philosophy (Bryant, Srnicek, and Harman 2011; Harman 2009, 2005) and its endeavour to conceive of reality beyond human access, object-oriented geographies place non-human entities at the centre of their analysis. In a way, they even exceed the symmetrical anthropology introduced by Bruno Latour and taken up by various others (Latour 2005, 1993; Whatmore 2002; DeLanda 2006; Law 1994; Braun 2006). This article seeks to marry object-oriented philosophies with symmetrical approaches in the tradition of actor-network theory (ANT). In doing so, it advances recent object-oriented geographies (Shaw and Meehan 2013; Meehan, Shaw, and Marston 2013, 2014) by conceiving of objects as powerful, metamorphic and mediative. The empirical part recounts the story of programming tree planting in Uganda. First, I follow the tree from matter to form, and how it *metamorphoses* between the physical tree 'out there' and its various reincarnations in North-South cooperation, a principle that characterises development praxis more generally. Second, I show how *powerful* trees are, by revealing what difference they make to politics and nation building in post-colonial Uganda. Third, I cast light on how trees are the point of reference for various rationalities and thus *mediate* between otherwise different worlds that would remain unmediated.

The stories I tell in this paper are informed by empirical fieldwork carried out in a variety of places across Uganda. Based on multi-sited ethnography, I 'followed the object' to its various sites of enactment, using an approach that was developed in anthropology (Marcus 1995; Falzon 2009) and that has been popularised in geography by the studies of Ian Cook and colleagues on the geographies of food and their attempt to defetishise commodities (Cook and Harrison 2007; Cook 2004; Saguin 2014). In this vein, I try to expose the hidden scripts and changing relations that otherwise might be depoliticised when 'naturalising' the tree (Heynen, Kaika, and Swyngedouw 2006). In order to do so, I compare trees across sites, 'contrasting and juxtaposing' their multiple beings (Sørensen 2010, 56; Niewöhner and Scheffer 2010). This includes in-depths interviews with representatives of donors, employees of the non-governmental organisations and various stakeholders in tree planting programming, foremost in the Northern Ugandan districts of Gulu and Kitgum: prison wardens, army soldiers, school teachers, farmers and local government officials. Multi-sited ethnography is not limited to sites in the common sense of the word. Project documents, Internet presences, media coverage, such as radio spots and newspapers, were consulted, too.

Before presenting the empirical findings, however, I will outline my theoretical take on objects. I do this by interrogating the recent debate on object-oriented geographies against the background of arguments that have been developed in the wake of actor-network theories. The empirical part of the paper presents three facets of the tree and the intricate ways it is entangled in the current fight against climate change. The last part of the paper concludes by outlining how the trees' geographies presented in this paper might advance object-oriented geographies more generally and what is needed in order to do so.

Objects: Powerful, metamorphic, mediative

Are Objects actors changing the world? It is no bold claim to assume that ontologies concerned with the more-than-human have been foremost rejected for ascribing 'agency' to mindless entities of our world. The confusion, however, stems from misinterpretations of 'agency' as 'intentionality'. Certainly the one cannot be equated with the other. By contrast, object-oriented ontology 'disentangles agency from intentionality' (Law and Mol 2008, 58). While intentionality is indeed reserved for human beings, agency is not. In object-oriented ontologies, agency can be defined as 'making a difference' (Law and Mol 2008). The world is not simply 'waiting impassively for us to make up our minds' (Whatmore 2003, 92). More-than-human geography claims to factor in 'the senses, dispositions, capabilities and potentialities of all manner of social objects and forces assembled through, and involved in, the co-fabrication of socio-material worlds' (Whatmore 2006, 604), reflecting related programmes such as ANT and Science and Technology Studies (Knorr Cetina 1981, 1999; Latour 1987, 1999, 2004, 2005; Latour and Woolgar 1979; Law 1986b; Mol 2002; Pickering 1984, 1992; Shapin and Schaffer 1985) or assemblage thinking in and beyond geography (Anderson and McFarlane 2011; Anderson et al. 2012; Woodward and Jones III 2005; Deleuze and Guattari 1987; DeLanda 2006). These objects 'make a difference to each other: they make each other to be' (Law and Mol 2008, 58). In short, objects are force-full (Shaw and Meehan 2013).

Here, we come to a critical conjunction of more recent object-oriented ontologies. While approaches in the tradition of ANT conceive of actors as 'emerging in practices of association and dissociation' and not as *a priori* (Lien and Law 2011, 69 f.), object-oriented geography (OOG) as currently introduced by Ian Shaw and colleagues (Shaw and Meehan 2013; Shaw 2012; Meehan, Shaw, and Marston 2013, 2014) based on a reading of the speculative philosophies of Bryant (2011) and Harman (Harman 2009, 2005) assigns such an *a priori* agency to objects, 'speculating once more about the nature of reality independently of thought and of humanity more generally' (Bryant, Srnicek, and Harman 2011, 3). At this point, ANT is, surprisingly, closer to Marxist approaches than to its sibling OOG. Rejecting object fetishism, that is prematurely 'attributing intrinsic qualities to entities or categories whose boundaries are 'extrinsic' (Bakker and Bridge 2006), Marxists emphasise that the essence of objects is to be found in their external relations (Henderson 2009, 274 f.). This is not to say that objects are mere correlates of the human mind or surrogates of a capitalist mode of production but endowed with agency in the above-mentioned sense. Where ANT and OOG, and even Marxists (e. g. Castree 2002), agree is in the assumption that objects, no matter how conceived of ontologically in the first instance, are 'engines of affect, constantly generating difference' (Shaw and Meehan 2013, 218). However, ANT and OOG diverge over the latter's assumption that an object's impact on the world is never 'exhaustive because there is "cryptic reserve" within each object' (Shaw and Meehan 2013, 218). This hidden quality makes an object exist 'independently of its relations' (Shaw and Meehan 2013, 218), 'autonomous from us and from each other (…) independent things that exist even when we sleep or die' (Harman 2011, 22). Relationist theories such as ANT (and certainly Marxism, too), in turn, maintain that it is *only* the relations that make the object: 'An actor in the hyphenated expression actor-network is not the source of an action but the moving target of a vast array of entities swarming toward it' (Latour 2005, 46). In other words, for object-oriented thinkers 'a network is always the outcome of the force-fullness of objects, and this is the opposite conclusion ANT traditionally makes' (Shaw and Meehan 2013, 23; Harman 2011). I do not see that kind of contradiction here, because the object in my reading is both: an effect of

network, and, at the same time, an ontological *a priori*, when it comes to its effects on the world. Let me justify that assumption by using arguments advanced in critiques of early ANT writings.

Objects can only partially be conceived of as 'immutable mobiles' as suggested by what later came to be known as ANT (Latour 1987, 1986; Law 1986a). On conceptual grounds the foundational version of ANT was criticized for being too functionalist as it focussed foremost on how configurations are held stable and the question of the conditions for entities to be unchanged across time and space. In what could be called a post-ANT reading, objects are 'fluid' (de Laet and Mol 2000; de Laet 2000) – 'mutable mobiles' being able to change shape (Mol and Law 2001, 613), or 'fire' – continuing to exist by being present in some parts while others are absent (Mol and Law 2001, 613). It all depends on the object's situatedness. When they move to a new site, objects enter into relations that are different from those they had in another place. Those conversant with post-ANT writings are familiar with the intriguing accounts of the bush pump in Zimbabwe which, though remaining the same device, unites local communities, builds the Zimbabwean nation and promotes the health of rural populations (de Laet and Mol 2000). Geographers have scrutinised the changing entanglements of objects in the world, such as cattle grids that have been used for a long time to prevent animals from escaping and which, through discursive shifts, are now enrolled in climate change adaptation by preserving ecosystems through free-grazing (Leyshon and Geoghegan 2012), or the transformation of field trials into risk assessments of genetically modified trees (Valve 2011). Commodity geographies, too, have emphasised the changing entanglements of objects in the world (Saguin 2014; Cook and Ward 2012; Cook and Harrison 2007; Cook 2004, 2006; Castree 2004). Another classical piece of post-ANT reasoning is Latour's detailed empirical description of a scientific expedition to the Amazonas region, which shows how objects circulate between matter and form and enter into different relations ranging from the impenetrable forest to scientific inscriptions (Latour 1999). By being inscribed in maps, diagrams, publications and the like, objects metamorphose not only between 'nature' and 'culture' but also between the concrete and abstract (Ferraris 2012a, 229 f.).

In other words, when the time-space component is brought in, the perceived inconsistency between ANT and object-oriented philosophy dissolves. Then, objects are seen as relating to the world while at the same time hiding their 'cryptic reserve' which, in turn, might come to light when moving across space to a different context. I call this object state metamorphic as it describes both the transformation of an object (e. g. from caterpillar to butterfly) while emphasising that parts of it remain the same (in this case its DNA or material composition of proteins). So while objects might be endowed with multiple identities, their potential beings are constrained not only by their materiality (Harré 2002), but also by what is not accessible to other entities in this particular place and time (Harman 2009, 132). Hence, an object can never be fully reduced to its relations, but its autonomous core depends on these relations in that it is exactly that which the relations are not: its absent other (Law 2006; Callon and Law 2005).

This particular configuration accounts for a third entanglement of objects in the world. That is that objects are mediative. For political ecologists it comes as no surprise that the same material environment is subject to heavy discursive and material disputes: extractive industries make use of it as necessary raw material, conservationists seek to protect it as wilderness, while the population conceives of it as a *heimat* that is not reducible to crude economic interests nor to a territory free of human influence. Elsewhere, I have shown how the fight against climate change links up a variety of different rationales that often have nothing to do with fighting climate change as such (Weisser et al. 2014). In a most general sense objects are 'multiple' in character (Law and Mol 2008), varying 'from place to place and from practice to practice' (Lien and Law 2011, 66). This does not imply that objects are mere plasma, arbitrarily changing shape all the

time. Rather, they can be conceived of as 'boundary objects' that are 'plastic enough to adapt to local needs and the constraints of the several entities employing them, yet robust enough to maintain a common identity across sites' (Star and Griesemer 1989). In this way, objects are crucial mediators of what is otherwise unmediated. Objects may connect different worlds and rationales and they may create common ones. As connection standards, they establish 'technological zones' (Barry 2006), for example the metric system, standardised network protocols that form the basis of the internet, or patents in global property regimes (de Laet 2000).

Not only in these examples are we confronted with issues of power. If ontology in general builds upon an objectified world, then politics necessarily does so, too. But how are objects entangled in the exercise of power? In which way do they perpetuate power, and how do they resist? For object-oriented geographies, the policing of the world (Rancière 2001) is the 'effect of the activity of objects', or rather an 'ecosystem of objects' (Shaw and Meehan 2013, 220). There is no doubt that objects are a crucial part of policing the world – one might think of wiretaps, cameras and standardised tests in the performance of state power (Meehan, Shaw, and Marston 2013), iris scanners at the biometric border (Amoore 2006) or aerial drones in the 'war on terror' (Shaw and Akhter 2012). However, this world is not necessarily accepted by all and created without effort but meets resistance. One might think of the #NotABugSplat artist collective that objected to remote killing operations by bringing the human factor back in and installing large posters portraying child faces that are recognised by the remote operators instead of abstract target marks. Non-humans, too, behave in unpredictable ways, as Lien and Law (2011) have vividly shown for salmon aquacultures in Norway which force the intended 'domestication' of nature to be readjusted time and again. When policing is about a certain arrangements of objects in the world (Shaw and Meehan 2013, 217), the political element concerns the disruption of that particular order (Rancière 2001, §21). '[O]bjects need to be seen as political forces, precisely because of their ability to execute (as well as subvert) a certain, particular reality' (Meehan, Shaw, and Marston 2013, 3). In other words, arranging the world is about 'trials of strength' (Harman 2009). It is the work put forward to bring a certain world into being, which, at the same time meets resistances up to their non-human form: the 'cryptic reserve' of the object. In other words, what needs to be scrutinised when we are interested in the politics of objects is the configuration of the 'cryptic reserve' and the external relations of objects, their presences and absences (Shaw and Meehan 2013). This does not necessarily presuppose politics without humans. Regardless of the forcefulness of objects, interrogating the human component is still central, such as asking who controls mediative objects such as bank notes in a common market, or, which people benefit from the metamorphosis of objects; for example, who benefits when a papaya is stripped bare of its power relations in the production process and fetishised in Western consumption cultures (Cook 2004; Cook et al. 2005)? I will illustrate some of the issues raised in the theoretical part of the paper by interrogating empirical material.

The remainder of the paper is about following the tree through space and time, investigating the relations it builds with various worlds across different sites, and illuminating what these sites make present or absent, or what is left of the tree at all. In the next section, I start with interrogating trees' roles in global donor paradigms in the past decade and show the work necessary to translate the tree from matter to form.

Metamorphic objects: Circulating trees

Once a tree has been raised as a seedling, been planted at its point of destination as part of reforestation efforts and taken root in the soil, it becomes emblematic of spatial fixity, temporal endurance and physical steadfastness. However, there is another, more volatile and plasmatic, yet not arbitrary, dimension to the tree. Considering the support given in the past decade to Tree Talk, a Ugandan non-governmental organisation, is illuminating.

From 2002 to 2004 the Forest Sector Umbrella Program under the British Department for International Development (DFID) provided funding which facilitated forest sector reforms in Uganda. The main objective of Tree Talk was to raise awareness concerning the importance of forestry, especially amongst the youth, through a nationally distributed magazine. The years from 2006 to 2008 saw Tree Talk funded by the United Nations World Food Programme in which universal primary education in 13 districts was supported, alongside the establishment of infrastructure such as classrooms, teachers' houses and water and sanitation facilities. In this context Tree Talk helped schools in Northern Uganda and the Karamoja region to plant trees to provide for firewood demands in the course of humanitarian food aid for schools during the war. Within the framework of the United Nations Food and Agriculture Organisation's one year programme, Tree Talk enhanced nutrition through fruit tree growing. Whereas the immediate years after the war saw the tree mainly framed by and loaded into donor paradigms of food relief, the Wildlife Conservation Society and USAID's support which began in 2008 shifted the focus to protecting biodiversity hot spots.

In 2010 Tree Talk's preoccupation with planting trees became linked up with the discourse on global warming and brought the 'climate tree' into existence. Denmark committed 4.9 million Danish Kroner to tree planting in order to improve rural livelihood options and raise climate awareness. It was not surprising that this came at this time. Prior to the Copenhagen climate talks in 2009, Danish development cooperation embarked on heavily supporting climate change initiatives all around the globe. A two million Danish Kroner component of Danish climate change activities in Uganda was started in 2008, so that – as the project document says – 'Uganda effectively participates in [the international climate change negotiations] and is in a position to implement the resolutions decided upon' (Ministry of Water and Environment of the Government of Uganda & Royal Danish Embassy Kampala 2008). In other words, Danish support came in the wake of the Copenhagen summit, then considered as a milestone in international climate talks, establishing a legally binding climate regime beyond the Kyoto Protocol that ended in 2012. Thus, Tree Talk funding must be seen against the background of a discourse on the changing climate. It is this discourse that triggered support for Tree Talk as a supplement to the broader climate activities supported by the Royal Danish Embassy as assistance for the Government of Uganda. But as with all the other support, every other year, Tree Talk has to deal with new paradigms. Though very pleased with its support, DANIDA is about to change its cooperation with Tree Talk. The Danish development cooperation's 'Local Grants Authority' framework, through which Tree Talk is funded, does not allow for extension of the same activity. Something new has to be thought up. Luckily, Denmark has come up with a new development strategy providing new paradigms, this time Green Growth. Certainly, planting tree fits in to this as well.

The National Coordinator of Tree Talk is aware of the fact that donors prescribe how the programmes are framed:

> *[A]ctivities, (…), are donor-driven (…). If they come with a new programme, we wash our hands, change our faces, put boots on and do that (…). We don't stick to our model. New ideas enrich our model*[1].

As can be seen from the statement planting trees must be integrated time and again into changing discourses in North-South cooperation. Heading the organisation requires knowing the business:

> *The donors give you details of outputs to deliver, including indicators and targets. We draft proposals with respect to donors. You know RFP, request for proposals? There are different ways to initiate a project. The most common way in Uganda, even in other countries, are RFP. The donors have their money. With the RFP they explain what needs to be done, the targets, the objectives and the indicators. Then you draft a proposal based on your programme and what the donor wants. But it has to be an agreement between the donor and us. But for small organisations, like those CBOs, they have no bargaining power. They accept whatever comes. If you are poor you respond to whatever is available.*[2]

Apparently, the tree is flexible enough to comfortably accommodate different development paradigms from food aid to fighting climate change and its effects. While remaining the same physical object, the tree can be represented in various ways. Recalling the previous statements by the National Coordinators, what makes a tree a climate tree is, in the first instance, its existence in documents circulating between the ministries of donor countries, the headquarters of international organisations and implementing agencies such as Tree Talk. Enacting the climate tree is the art of writing proposals and drafting documents that in turn are triggered by other ones, such as the RFP, or the Kyoto Protocol and other documents of the international climate regime. The Tree Talk national coordinators need to be well practised in this art. For others it has become so complicated that an entire profession has emerged – the consultants, paid by donors to write proposals and requests for funding. Howsoever, trees planted in Northern Uganda under the auspices of Tree Talk have been loaded into a discourse, at least to a certain extent, and it is not the material tree out there but representations of the tree that are inscribed in the respective programmes.

However, there is a problem to be overcome. When you move to the field with the clearly and precisely elaborated document, the trees that have been planted are hardly visible. Despite hours of driving through Northern Uganda, you will find it hard to track down those trees planted to mitigate and adapt to climate change. In an area the size of Northern Uganda the 4.5 million trees talked about in the project documents are just a tiny drop in the ocean. By changing sites, from the written statements, plans and objectives documented in headquarters to the Northern Ugandan bush, the tree has more or less disappeared. More work needs to be done in order to bridge the gap between the physical tree out there and its representation in project accounts. Materiality ('the tree planted') and form ('the project is successfully fighting global warming') need to be connected and retraceable. In the words of the Tree Talk project, it sounds like this: 'the Tree Talk on-the-ground model is proven and working. Project files, record books and other tools capture data from schools, institutions and community groups' (Tree Talk 2010, 14). The field staff of Tree Talk know all the places where trees have been planted.

1 Tree Talk National Coordinator, 7 / 9 / 11.
2 Former Tree Talk National Coordinator, 14 / 10 / 11.

However, knowing is not enough. Inscriptions are required. Countersigned delivery notes of seedlings testify that seedlings have been handed over. Progress reports indicate was has been done. This is subject to a process of monitoring and evaluation. It is not a can but a must, in order to meet the standards of the development partners. It is even more so when tree planting is registered for international carbon markets. Partnered with the not-for-profit environmental conservation organization ECOTRUST, Tree Talk is working with farmers to raise trees for carbon sequestration and sale of carbon credits. The basic principle is that farmers are paid for the ecosystem services their farms provide. In order to calculate the overall ecosystem service of a farm, calculation is paramount. Trees need to be counted, diameters measured, species recognized. The same is true of tree planting for climate adaptation. There the rationale is not to get paid for carbon offsetting but to account for project money provided by donor budgets derived from taxpayers' money. In other words, the physical tree needs to be translated into numbers.

It is these figures that in the end legitimise the undertaking. The tree can be easily counted. Figures are convincing as facts and that is how we want to see the world, clear and measurable, ideal for development cooperation and its mode of governance which involves monitoring and evaluation. In project reports, media coverage and radio spots, figures are paramount, accounting for the success of the programme, probably best reflected by the celebrating of certain figures:

> *On Tuesday, August 11th, the USAID-funded Wildlife, Landscapes, and Development for Conservation (WILD) program celebrated the planting of its 1,000,000th tree. The event, hosted at Paloga Primary School in Lamwo district where the Tree Talk/WILD Central Nursery is located, drew more than 200 people from as far as Kampala—including representatives of NEMA, the Ministry of Water and Environment, WFP, FAO (...) to participate in the half-day celebration*[3].

The persuasiveness of the figure is of course well known to the National Coordinator of Tree Talk, who has been in the business for years and has seen different programmes coming and going and is well aware of how to cook up a successful project:

> *Germans like numbers, Americans even more. It is not about impact. It is about numbers and numbers (...)*[4]*. [And] it is very easy to raise seedlings. You can easily raise 400,000 seedlings from a nursery a year*[5].

Figures by their sheer presence are one way to render a project successful. Trees are represented by figures that in turn represent the fight against climate change. Figures can easily be aggregated and inserted into documents. With a few mouse-clicks these representations of the tree travel the world, linking up Northern Ugandan landscapes, the headquarters of international donors and the global climate regime.

While this part of the paper has emphasised how the tree metamorphoses from matter to form, connecting otherwise far-distant sites, and how this is the necessary condition of development praxis, the next section asks in which way the tree makes a difference to Ugandan post-colonial politics and nation-building

3 Tree Talk, no year.
4 Tree Talk National Coordinator, 18/9/12.
5 ibid.

Powerful objects: 'Trees stand tall and proud'

While approaching Mount Elgon where Tree Talk recently embarked on reforesting the heavily degraded mountain ecosystem, one is stunned by the majestic Mvule trees that stand 'like soldiers mounting a guard of honour for passersby'[6]. Like trees lining an avenue, they not only escort the voyager to Mbale town at the foothills of Mount Elgon but inhere in Ugandan nation-building and post-colonial politics.

When talking to foresters in Uganda much reference is made to a man called Semei Kakungulu, who is remembered and praised for his visionary efforts to plant trees at a time where deforestation was not issue at all. Environmentalist is an identity Kakungulu acquired only recently. It added another to his successive '"nine lives" (…) immediately before, during, and after the imposition of British protectorate rule' (Twaddle 1985, 325). In fact, he was a jack-of-all-trades. Described by Baganda writers in the first half of the twentieth century as 'elephant hunter, guerrilla leader, Ganda chief, border warlord, British ally in military campaigns, "native collector", colonial client-king, President of the Busoga Lukiko, and leader of the anti-medicine Bamalaki and Bayudaya separatist sects' (Twaddle 1985, 325), there is still today a highly contingent moment in his identity, to which the tree makes a difference.

In 2012 the two Ugandan daily quality papers, New Vision and Daily Monitor, published a series of detailed and insightful articles on events and personalities to mark 50 years of Uganda's independence. Both papers gave an account of the same person, Semei Kakungulu.

While the pro-government New Vision praised him as 'the tree lover' whose 'legacy stands tall and proud', the Daily Monitor did not mention his environmental identity but told the story of 'The making of a colonial mercenary'. Whereas the unfavourable account in the Daily Monitor must be read as a critique of collaborators with the British colonial power and 'celebrates' 50 years of independence in this way, the article in the New Vision also does the same thing but it is more difficult to decipher. Reading the first sentences, and bearing in mind the closeness of the paper to Museveni's ruling National Resistance Movement, one would assume just another blunt piece of government-belauding journalism, aligning the present administration with Kakungulu's achievements in tree planting and building the nation by reference to a beloved 'non-conforming heroic figure who turned his back on the "establishment"' (Twaddle 1985, 325). Comments like 'Remembered for the millions of Mvule trees that were planted during his time' and 'When Semei Kakungulu, a warrior and tribal leader died, a part of Uganda's history also died' indicate that[7]. Yet, the subsequent passages might be read as a critique of the government, when, for example, the former executive director of the National Environmental Management Authority is cited as saying 'attempts to mobilise people to plant as many trees as those Kakungulu planted have failed'[8]. But continuing reading tells a different story. It begins with the statement that Kakungulu's kind of 'planting comes from the heart and that Kakungulu is a man who was in love with trees'[9]. The subtext: others are not. The reasons put forward for failed attempts to re-green Uganda with indigenous trees the way Kakungulu did, are in no way related to the performance of the ruling parties. Rather, the author blames those going for exotic

6 New Vision, August 27, 2012.
7 ibid.
8 ibid.
9 ibid.

species such as pines and eucalyptus, while not mentioning that the NRM-controlled National Forest Authority is the largest planter of pines. Sub-county environmental committees and the non-compliant population are held responsible, or even a general decline of society: 'Everybody thinks he is a leader and the respect and power that parish chiefs or sub county chiefs once wielded has been eroded'[10]. Referring once again to Kakungulu, the author cites sources that say he planted trees 'to show power and occupation', a way of saying, '"[w]e have taken over" (…) we are in control over this expansive territory east of the Nile.'[11] According to the author, '[c]urrent leaders should learn from Kakungulu and could use a range of incentives to entice the public into tree planting. Kakungulu used coercive means (…) forcing the masses to grow.'[12] In other words, Kakungulu is praised for his authoritative way of ruling which, according to the writer, can serve as a good example for the present government.

The tree has made a difference to both Semei Kakungulu and governmental legitimisation in terms of (environmental) governance in the decades since independence. If it were not for the daily papers and foresters' narratives, Kakungulu would not be remembered and inscribed into post-colonial politics. However, this is only possible because of the trees' materiality. If they did not 'stand tall and proud', these narratives would never have been told.

This is not the only way trees are powerfully entangled in Ugandan post-colonial politics and nation-building. The tree holds the power to boost even more state legitimacy. It links up a whole array of partly overlapping, partly different interests, such as those of schools, community groups, health units, churches, prisons, police and the army, which are all united in the endeavour to plant trees and re-green Uganda. Let us listen to a radio spot, a conversation between a Uganda People's Defence Force soldier and his superior, 'Afande' or commander:

> *UPDF Soldier: Afande, now that the war in Northern Uganda is over and most of Uganda is peaceful, what are we going to do the rest of our lives?*
>
> *Afande: Who told you the war is over? It is only one enemy that we have defeated. There are new enemies such as poverty, climate change, scarcity of firewood and we need to fight them. The battle is on.*
>
> *UPDF Soldier: Afande, which guns do you use to fight poverty and climate change?*
>
> *Afande: You can fight them. One way is to plant trees.*

The UDPF is gaining new legitimacy and self-esteem, particularly in Northern Uganda where the army, mainly consisting of Southerners, is still not known for having a high reputation and good records amongst the population (Finnström 2003). This is how a commander I talked to emphasised the crucial role of the army:

> *[W]e [the army] understand better. The army is following the directives. The level of sensitisation in the army is higher. Outside the people get the information through the*

10 ibid.
11 ibid.
12 ibid.

> *radio and the media. If Tree Talk says we have a project you see people have no transport and won't come. Tree Talk has a message but no directive. We have.*[13]

The feeling of being seen as 'stupid soldiers', as one member of the army has put it, is alleviated by having success in the exercise of tree planting. Though rarely mentioning climate change, the UPDF is an inherent part of fighting it, albeit on its own terms. The tree makes a difference, whether to the nation's identity or to the legitimacy of state institutions. While this section has emphasised how trees are powerful objects, the next section considers one particular case: the mediative role of trees in development project praxis.

Mediating objects: Trees connecting worlds

There is no way that forestry in the age of sustainability can embark on planting anything other than indigenous species, especially in the light of the notorious Eucalyptus. The latter has gained a very bad reputation over the years in all parts of the world. Accordingly, people are urged to plant indigenous species. We only need to read Tree Talk's biannual newspaper that is distributed all over the country – or listen to advertising jingles broadcast by Northern Ugandan radio stations:

> *Komakech: Why do we have to plant indigenous trees such as mahogany, mvule, Markhamia, shea nut and yet they can grow on their own?*
>
> *Okot: Of course we have to plant them!! They are our pride as a nation. They are habitats of birds, insects and other living things. They also produce good quality and highly priced products such as timber.*

Such radio spots are produced to make the fight against climate change fit Northern Ugandan realities. There is no mention of climate change. Rather, the nation is invoked, economic reasons are highlighted and an appeal is made to the listeners' respect for living creatures. For the programme to work it has to be done this way. Most people are not interested in global warming or in planting indigenous trees, least of all one who is responsible for delivering this message, an employee of the organisation. On his 80 hectares of land he is planting Eucalyptus. And he puts forward good reasons:

> *Benefits are very fast. At every stage you have a product to sell. The demand is high. You never make losses with eucalyptus. (…) Why don't I do what I preach? I am a business person. That is what pays for me. While I am watching the mahogany, I have harvested the eucalyptus seven times.*[14]

13 Discussion with UPDF soldiers at Pajimo Army Barracks, Kitgum District, 20/8/12.
14 An employee of Tree Talk, anonymised.

It is clear that for most of what Kampala's development brokers call communities, and for most Ugandans, as seen in the above example, imminent economic purposes are paramount:

> *'People have planted trees for various reasons. They have planted trees in the name of sustainability in the 70ies and 80ies; then in the name of environmental conservation (...). It was not successful. Now with economic gains everybody is planting trees (...) Farmers don't mind much about carbon. It becomes difficult to talk about climate change in the atmosphere. It is rather the economic objective that pushes. So among those farmers you won't get the answer, we plant trees to fight climate change'*[15].

Most Ugandans have a conception of development that is opposed to conservation narratives, and to the recent climate change paradigm. The National Coordinator adds:

> *Who said Eucalyptus is bad? If you are going to Australia and the US all people say it is bad. We have stretches of [natural] forest: Budongo, Mabira...Why don't we allow the community on their small area grow Eucalyptus?*[16]

Tree Talk staff are supposed to implement activities to fight climate change amidst trials of strength, mediating between scientific conservation and vernacular notions of development. On the one side are the indigenous trees and on the other side the exotic ones, both of which have allies on their side:

> *The programme design has it objectives. The donor has its interest: conserve the environment, biodiversity, the government of Uganda and local governments want to preserve genetic material, the communities want environment and economic gains.*[17]

Tree Talk staff are very aware of this tension, yet the identification of 'real' needs might be distorted as the target population is 'experienced' in the field of development cooperation and knows how the business is run:

> *If [someone] would work for UNICEF, they know that he wants to hear something about children. They will package everything with children. They give it to him the way he wants to hear it.*[18]

The same is true for Tree Talk. People, especially in war-torn Northern Uganda, have got accustomed to development aid. They have become real experts in NGO shopping, clearly aware of how to articulate what is required and knowing what money is available for. Rottenburg (Rottenburg 2005, 2009) has called the resulting mode of communication a 'meta-code' by which 'actors are able to avoid negotiations over matters which would deviate from their purpose at hand' (Rottenburg 2005, 267). That talking in a meta-code is nothing that the responsible

15 Tree Talk National Coordinator, 29/9/11.
16 Tree Talk National Coordinator, 18/9/12.
17 Tree Talk National Coordinator, 15/9/11.
18 Tree Talk National Coordinator, 29/9/11.

employees are unaware of can be shown by a statement in which a Tree Talk staff member describes the project practice:

> *Those people are used to our talk. They are our consultants at village level [laughter]. They are constantly exposed to training sessions. They know the reasons why we plant.'*[19]

While everyone is sharing the same meta-code – planting trees to fight climate change – trees are mostly planted for other reasons: to boost households' income, demarcate contentious boundaries or raise the legitimacy of ill-esteemed state institutions. What I encountered in the scattered homesteads and army bases of Northern Uganda's Kitgum and Gulu Districts is trees that have little to do with climate science or sequestering carbon dioxide.

However, the project does work. Interviewing the Danish Development Counsellor responsible, I asked 'if Tree Talk has met DANIDA's expectations so far?' and got the answer: 'more than 100 % (…) it is practical (…) when high level visits come (…) the Minister (…) the Crown Prince (…) we need to show something (…) people want to see something in the field'[20]. Twice, the Foreign Minister of Denmark has visited. She saw what she wanted to see, and what people typically assume to be development cooperation: concrete and visible activities. So this project makes a good case – as the Danish representative stated – 'to mix tangible things with meetings in the programme for the minister'[21]. A tree is simply there. It can be seen. Everyone knows what a tree is, both in Denmark and Uganda. It is a 'boundary object' connecting time-spaces, 'global' donor paradigms and scientific realisms in the wake of climate change and diverse cosmologies of state institutions and the population. This capacity depends on the tree's ability to be an object of particular kinds: powerful, metamorphic and mediative.

Conclusion

Objects matter. However, they do so in different ways. This paper has recounted the stories of trees' entanglements in reforestation efforts in the current fight against climate change. Three intricate geographies have been outlined. In the first section, it has been argued that trees are metamorphic. Planting trees to fight climate change is not constituted by the act of planting trees *per se*. The same act has been performed millions of times before, and still is, every day, however not for the reason of adapting to or mitigating climate change. Interrogating cosmologies in Northern Ugandan realities, one hardly finds trees planted for the purpose of fighting global warming. In Northern Ugandan cosmologies, trees are about many things – household economic rationales is just one example – but not about climate change. Only at a great distance is the tree enrolled in the international climate regime, for instance in connection with global carbon dioxide trading schemes, which aim at mitigating climate change by putting a price on emissions and creating a market-based mechanism for environmental governance. If one seeks to encounter the climate tree, one has to move from scattered sites in rural Uganda to other

19 ibid.
20 Representative of DANIDA.
21 ibid.

places, at least to Tree Talk's field offices in the provincial towns of Kitgum or Gulu, and better to the headquarters of international organisations and development agencies based in the upper class areas of the capital, Kampala. These are the sites where global paradigms condense and materialise in programme and project documents filed either as hardcopy on the shelf or as digital versions on a storage medium. In other words, the tree's metamorphosis between matter and form is the necessary condition for development projects' praxis. They not only bridge far distant places – what we call 'global' and 'local' – but also the physically concrete and the conceptually abstract.

The second section focused on how trees are powerful, and how, by their sheer materiality, they make a difference to narrating the Ugandan nation. This way, imaginative geographies can by no means be reduced to linguistics only but depend decisively on objects. Objects can but do not have to be equated with materiality (Meehan, Shaw, and Marston 2013, 3) or a thing-like state of being. Objects can be both, autonomous and real or merely sensual (Harman 2009, 190), big or small, near or far. Trees are not just a correlate of global paradigms or economic reasoning. Rather, trees have their own agency, they make a difference. If they did not 'stand tall and proud' (or if they did not have the capacity to do so), the world would look different. A whole set of stories would not have been told, some of which I have recounted in this paper.

While we encounter the tree as multiple beings, the tree is still a tree, with roots, a trunk, hundreds of branches and thousands of leaves or needles. So thirdly, while the tree changes its shape across sites, there is some essence to it, even if the tree's being is metamorphic and spatially dispersed. Despite all the differences, the tree is recognisable as a tree, whether for a North Ugandan Farmer, a development counsellor or a climate diplomat on the international scene. In its own way, the tree is mediative. This accounts for what others have described as a 'boundary object'. On the 'positive' side, mediating objects allow for the success of development programmes. At the same time, they may bolster authoritarian projects when 'naturalised' and cut off their entanglements in politics.

When all these considerations are taken together, what conclusion may be drawn for object-oriented philosophy in general? When objects are no mere correlate of human thought but powerfully entangled in our world, is speculation then the only way left of approaching reality in the wake of a proclaimed 'speculative turn' (Bryant, Srnicek, and Harman 2011)? How can we think about reality if humanity and thought are dislodged altogether? It is certainly beyond the scope of this conclusion to give an encompassing answer. What might be a stepping-stone is a precise account of our conception of objects.

In his oeuvre, new realist philosopher Maurizio Ferraris distinguishes three kinds of objects (Ferraris 2012b, 2012a, 2007, 2009, 2008). Natural objects 'exist in space and time independently of subjects' (Ferraris 2012a, 2). This is unproblematic with regard to speculative philosophies for obvious reasons. A second type of object according to Ferraris is the ideal one, characterised by being existent outside space and time, and independent of subjects (Ferraris 2012a, 2) such as mathematical absolutes as envisaged by Badiou in his ontology (Badiou 2005). Here, too, no apparent incongruences loom. Where 'speculation-only' becomes more difficult is when considering a third variety of object-being – social objects. However, social objects are the ones we are most concerned with as human geographers, just as this paper is. I did not inquire in a 'natural object' in Ferraris sense, the tree was of interest only insofar as it entered society, became a social object. Social objects in Ferraris' reading 'exist in space and time and depend on subjects' (Ferraris 2012a, 2) but only under the condition that 'we are aware of [their] existence, and in order to be aware of something it is, first and foremost, imperative that we remember it'

(Ferraris 2012b, 42). To be remembered, an object needs to be inscribed, be it as text in a document, practices in social interaction or biochemical connections in our brains. Altogether, then, while setting a 'deliberate counterpoint to the now tiresome "Linguistic Turn"' (Bryant, Srnicek, and Harman 2011), 'pure' and dogmatic speculation would not be conducive to future object geographies as it precludes too many features of the world that we as Human Geographers are concerned with and that we have something to say about.

References

Amoore, Louise. 2006. Biometric borders: Governing mobilities in the war on terror. *Political Geography* 25: 336-351.

Anderson, Ben, Matthew Kearnes, Colin McFarlane, and Dan Swanton. 2012. On assemblages and geography. *Dialogues in Human Geography* 2 (2): 171–189.

Anderson, Ben, and Colin McFarlane. 2011. Assemblage and geography. *Area* 43 (2): 124–127.

Badiou, Alain. 2005. *Being and Event*. New York: Continuum.

Bakker, Karen, and Gavin Bridge. 2006. Material worlds? Resource geographies and the 'matter of nature'. *Progress in Human Geography* 30 (1): 5–27.

Baldwin, Andrew. 2009. Carbon Nullius and Racial Rule: Race, Nature and the Cultural Politics of Forest Carbon in Canada. *Antipode* 41 (2): 231–255.

Barry, Andrew. 2006. Technological Zones. *European Journal of Social Theory* 9 (2): 239–253.

Bonta, Mark. 2005. Becoming-forest, becoming-local: transformations of a protected area in Honduras. *Geoforum* 36 (1): 95–112.

Braun, Bruce. 2002. *The intemperate rainforest. Nature, Culture, and Power on Canada's West Coast*. Minneapolis and London: University of Minnesota Press.

—. 2006. Environmental issues: global natures in the space of assemblage. *Progress in Human Geography* 30 (5): 644–654.

Bryant, Levi R. 2011. The Democracy of Objects. Ann Arbor: Open Humanities Press.

Bryant, Levi, Nick Srnicek, and Graham Harman. 2011. Towards a Speculative Philosophy. In *The speculative turn: continental materialism and realism*, eds. L. Bryant, N. Srnicek and G. Harman, 1–18. Melbourne: re.press.

Callon, Michel, and John Law. 2005. On qualculation, agency and otherness. *Environment and Planning D: Society and Space* 23 (5): 717–733.

Castree, Noel. 2002. False Antithesis? Marxism, Nature and Actor-Networks. *Antipode* 34 (1): 111–146.

—. 2004. The geographical lives of commodities: problems of analysis and critique. *Social & Cultural Geography* 5 (1): 21–35.

Cook et al., Ian. 2005. Positionality / Situated Knowledge. In *Cultural Geography. A Critical Dictionary of Key Concepts*, eds. D. Atkinson, P. Jackson, D. Sibley and N. Washbourne. London, New York: I.B. Tauris.

Cook, Ian. 2004. Follow the Thing: Papaya. *Antipode* 36 (4): 642–664.

—. 2006. Geographies of food: following. *Progress in Human Geography* 30 (5): 655–666.

Cook, Ian, and Michelle Harrison. 2007. Follow-the-Thing: "West Indian Hot Pepper Sauce". *Space and Culture* 10 (1): 40–63.

Cook, Ian R., and Kevin Ward. 2012. Conferences, informational infrastructure and mobile policies: the process of getting Sweden 'BID ready'. *European Urban and Regional Studies* 19 (2): 137–152.

Crist, Eileen. 2007. Beyond the climate crisis: a critique of climate change discourse. *Telos* 141: 29–55.

Davis, Mike. 1999. *Ecology of fear. Los Angeles and the imagination of disaster*. New York: Vintage Books.

de Laet, Marianne. 2000. Patents, travel, space: ethnographic encounters with objects in transit. *Environment and Planning D: Society & Space* 18: 149–168.

de Laet, Marianne, and Annemarie Mol. 2000. The Zimbabwe Bush Pump: Mechanics of Fluid Technology. *Social Studies of Science* 30 (2): 225–263.

DeLanda, Manuel. 2006. *A New Philosophy of Society. Assemblage Theory and Social Complexity*. London, New York: continuum.

Deleuze, Gilles, and Felix Guattari. 1987. *A Thousand Plateaus. Captialism and Schizophrenia.* Minneapolis and London: University of Minnesota Press.

Escobar, Arturo. 1996. Construction Nature. *Futures* 28 (4): 325–343.

Falzon, Mark-Anthony ed. 2009. *Multi-sited Ethnography: Theory, Praxis and Locality in Contemporary Research.* Farnham: Ashgate.

Ferraris, Maurizio. 2007. Documentality – Or Why Nothing Social Exists Beyond the Text. In *Cultures. Conflict – Analysis – Dialogue, Proceedings of the 29th International Ludwig Wittgenstein-Symposium in Kirchberg, Austria (Publications of the Austrian Ludwig Wittgenstein Society – New Series 3)*, eds. C. Kanzian and E. Runggaldier, 385–401. Berlin: De Gruyter.

—. 2008. Science of Recording. In *Philosophy of the Information Society. Proceedings of the 30. International Ludwig Wittgenstein Symposium Kirchberg am Wechsel, Austria 2007*, eds. H. Hrachovec and A. Pichler. Frankfurt: ontos verlag.

—. 2009. Documentality or Europe. *The Monist* 92: 286–314.

—. 2012a. *Documentality. Why it is necessary to leave traces.* New York: Fordham University Press.

—. 2012b. Perspectives of documentality. *Phenomenology and Mind* 2: 40–48.

Finnström, Sverker. 2003. *Living With Bad Surroundings: War and Existential Uncertainty in Acholiland, Northern Uganda.* Uppsala: Acta Universitatis Upsaliensis.

Fletcher, Robert, and Jan Breitling. 2012. Market mechanism or subsidy in disguise? Governing payment for environmental services in Costa Rica. *Geoforum* 43 (3): 402–411.

Food and Agriculture Organization of the United Nations. 2011. *State of the World's Forests 2011.* Rome: FAO.

—. 2012. State of the World's Forests 2012. Rome.

Gallemore, Caleb, and Darla K. Munroe. 2013. Centralization in the global avoided deforestation collaboration network. *Global Environmental Change* 23 (5): 1199–1210.

Harman, Graham. 2005. *Guerilla metaphysics: phenomenology and the carpentry of things.* Illinois: Open Court.

—. 2009. *Prince of Networks. Bruno Latour and Metaphysics.* Melbourne: re.press.

—. 2011. On the Undermining of Objects. Grant, Bruno, and Radical Philosophy. In *The speculative turn: continental materialism and realism*, eds. L. Bryant, N. Srnicek and G. Harman, 21–40. Melbourne: re.press.

Harré, Rom. 2002. Material Objects in Social Worlds. *Theory, Culture & Society* 19 (5–6): 23–33.

Henderson, George. 2009. Marxist political economy and the environment. In *A Companion to Environmental Geography*, eds. N. Castree, D. Demeritt, D. Liverman and B. Rhoads, 266–293. Malden, MA: Wiley-Blackwell.

Heynen, Nik, Maria Kaika, and Erik Swyngedouw. 2006. Urban political ecology: politicizing the production of urban natures. In *In the nature of cities. Urban political ecology and the politics of urban metabolism*, eds. N. Heynen, M. Kaika and E. Swyngedouw, 1–20. Abingdon, New York: Routledge.

Hulme, Mike. 2008. The conquering of climate: discourses of fear and their dissolution. *The Geographical Journal* 174 (1): 5–16.

Knorr Cetina, Karin. 1981. *The Manufacture of Knowledge: An Essay of the Constructivist and Contextual Nature of Science.* Oxford: Pergamon Press.

—. 1999. *Epistemic Cultures: How the Sciences Make Knowledge.* Cambrdige: Harvard University Press.

Latour, Bruno. 1986. The powers of association. In *Power, Action and Belief. A New Sociology of Knowledge*, ed. J. Law, 264–280. London and Boston, MA: Routledge and Kegan Paul.

—. 1987. *Science in Action. How to follow scientists and engineers through society*. Cambridge: Harvard University Press.
—. 1993. *We Have Never Been Modern*. New York: Harvester Wheatsheaf.
—. 1999. *Pandora's Hope. Essays on the Reality of Science Studies*. London, Cambridge: Harvard University Press.
—. 2004. *Politics of Nature. How to bring the Sciences into Democracy*. Cambridge: Harvard University Press.
—. 2005. *Reassembling the Social. An Introduction to Actor-Network-Theory*. New York: Oxford University Press.
Latour, Bruno, and Steve Woolgar. 1979. *Laboratory Life. The Social Construction of Scientific Facts*. Beverly Hills: SAGE.
Law, John. 1986a. On the methods of long-distance control: vesssels, navigation and the Portugues route to India. In *Power, Action and Belief. A New Sociology of Knowledge*, ed. J. Law, 234–263. London, Boston and Henley: Routledge and Kegan Paul.
—. 1994. *Organizing Modernity: Social Action and Social Theory*. Malden, MA: Blackwell.
—. 2006. *After Method. Mess in social science research*. London and New York: Routledge.
— ed. 1986b. *Power, Action and Belief*. London: Routledge.
Law, John, and Annemarie Mol. 2008. The Actor-Enacted: Cumbrian Sheep 2001. In *Material Agency. Towards a Non-Anthropocentric Approach*, eds. C. Knappett and L. Malafouris, 57–77. New York: Springer Science+Business Media, LLC.
Leyshon, Catherine, and Hilary Geoghegan. 2012. Anticipatory objects and uncertain imminence: cattle grids, landscape and the presencing of lcimate change on the Lizard Peninsula, UK. *Area* 44 (2): 237–244.
Li, Tania Murray. 2007. Practices of assemblage and community forest management. *Economy and Society* 36 (2): 263–293.
Lien, Marianne Elisabeth, and John Law. 2011. 'Emergent Aliens': On Salmon, Nature and Their Enactment. *Ethnos* 76 (1): 65–87.
Lin, Liwei, Erin Sills, and Heather Cheshire. 2014. Targeting areas for Reducing Emissions from Deforestation and forest Degradation (REDD+) projects in Tanzania. *Global Environmental Change* 24: 277–286.
Marcus, George E. 1995. Ethnography in / of the World System: The Emergence of Multi-Sited Ethnography. *Annual Review of Anthropology* 24: 95–117.
Martin, Adrian, Nicole Gross-Camp, Bereket Kebede, Shawn McGuire, and Joseph Munyarukaza. 2013. Whose environmental justice? Exploring local and global perspectives in a payments for ecosystem services scheme in Rwanda. *Geoforum* http://dx.doi.org / 10.1016 / j.geoforum.2013.02.006.
McElwee, Pamela D. 2012. Payments for environmental services as neoliberal market-based forest conservation in Vietnam: Panacea or problem. *Geoforum* 43 (3): 412–426.
Meehan, Katharine, Ian Graham Ronald Shaw, and Sallie A. Marston. 2013. Political geographies of the object. *Political Geography* 33: 1–10.
—. 2014. Commentary: The State of objects. *Political Geography* 39: 60–62.
Ministry of Water and Environment of the Government of Uganda & Royal Danish Embassy Kampala. 2008. Climate Change Initiatives. Support Overview Document Uganda.
Mol, Annemarie. 2002. *The Body Multiple: Ontology in Medical Practice*. Durham and London: Duke University Press.
Mol, Annemarie, and John Law. 2001. Situating technoscience: an inquiry into spatialities. *Environment and Planning D: Society & Space* 19: 609–621.

Müller, Martin. 2011. How natural disturbance triggers political conflict: Bark beetles and the meaning of landscape in the Bavarian Forest. *Global Environmental Change* 21 (935–946).

Munang, Richard, Ibrahim Thiaw, Keith Alverson, Musonda Mumba, Jian Liu, and Mike Rivington. 2013. Climate change and Ecosystem-based Adaptation: a new pragmatic approach to buffering climate change impacts. *Current Opinion in Environmental Sustainabilty* 5 (1): 67–71.

Niewöhner, Jörg, and Thomas Scheffer. 2010. Thickening Comparison: On the Multiple Factes of Comparability. In *Thick Comparison. Reviving the Ethnographic Aspiration*, eds. J. Niewöhner and T. Scheffer, 1–16. Leiden, Boston: Brill.

Pickering, Andrew. 1984. *Constructing quarks*. Chicago: University of Chicago Press.

—. 1992. *Science as practice and culture*. Chicago: University of Chicago Press.

Rancière, Jacques. 2001. Ten Theses on Politics. *Theory & Event* 5 (3).

Ribot, Jesse C. 1999. A history of fear: imagining deforestation in the West African dryland forests. *Global Ecology and Biogeography* 8: 291–300.

Rottenburg, Richard. 2005. Code-Switching, or Why a Metacode Is Good to Have. In *Global Ideas. How Ideas, Objects and Practices Travel in the Global Ecomomy*, eds. B. Czarniawska and G. Sevón, 259–274. Malmö: Liber.

—. 2009. *Far-Fetched Facts. A Parable of Development Aid*. Cambridge: MIT Press.

Saguin, Kristian. 2014. Biographies of fish for the city: Urban metabolism of Laguna Lake aquaculture. *Geoforum* 54: 28–38.

Shapin, Steven, and Simon Schaffer. 1985. *Leviathan and the Air-Pump: Hobbes, Boyle, and the Experimental Life*. Princeton: Princeton University Press.

Shapiro-Garza, Elizabeth. 2013. Contesting the market-based nature of Mexico's national payments for ecosystem services programs: Four sites of articulation and hybridization. *Geoforum* 46: 5–15.

Shaw, Ian Graham Ronald. 2012. Towards an evental geography. *Progress in Human Geography* 36 (5): 613–627.

Shaw, Ian Graham Ronald, and Majed Akhter. 2012. The Unbearable Humanness of Drone Warfare in FATA, Pakistan. *Antipode* 44 (4): 1490–1509.

Shaw, Ian Graham Ronald, and Katharine Meehan. 2013. Force-full: power, politics and object-oriented philosophy. *Area* 45 (2): 216–222.

Sørensen, Estrid. 2010. Producing Multi-sited comparability. In *Thick Comparisons. Reviving the Ethnographic Aspiration*, eds. J. Niewöhner and T. Scheffer, 44–77. Boston, Leiden: Brill.

Star, Susan Leigh, and James R. Griesemer. 1989. Institutional Ecology, 'Translations' and Boundary Objects: Amateurs and Professionals in Berkeley's Museum of Vertebrate Zoology. *Social Studies of Science* 19 (3): 387–420.

Swyngedouw, Erik. 2010. Apocalypse Forever? Post-political Populism and the Spectre of Climate Change. *Theory, Culture & Society* 27 (2–3): 213–232.

Tree Talk. 2010. The trees are alive. Tree Talk in Uganda. Kampala.

Twaddle, Michael. 1985. The Nine Lives of Semei Kakungulu. *History in Africa* 12: 325–333.

Valve, Helena. 2011. GM trees on trial in a field: Reductionism, risks and intractable biological objects. *Geoforum* 42 (2): 222–230.

Weisser, Florian, Michael Bollig, Martin Doevenspeck, and Detlef Müller-Mahn. 2014. Translating the 'adaptation to climate change' paradigm – the politics of a travelling idea in Africa. *The Geographical Journal* 180 (2): 111–119.

Whatmore, Sarah. 2002. *Hybrid Geographies. Natures, Cultures, Spaces*. London: SAGE.

—. 2003. Generating materials. In *Using Social Theory: Thinking through research*, eds. M. Pryke, G. Rose and S. Whatmore, 89–104. London: Sage.

—. 2006. Materialist returns: practising cultural geography in and for a more-than-human world. *Cultural Geographies* 13: 600-609.

Williams, Michael. 1989. Deforestation: past and present. *Progress in Human Geography* 13 (2): 176–208.

Woodward, Keith, and John Paul Jones III. 2005. On the Border with Deleuze and Guattari. In *B/ordering space*, eds. H. von Houtum, O. Kramsch and W. Zierhofer, 235–248. Aldershot: Ashgate.

Leipzig and Halle 2014.

www.spp1448.de