



At the junction between state, nature and capital: Irrigation mega-projects in Sudan



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ABSTRACT

This paper investigates the different ways in which the state can derive value from its control over space and non-human nature. The analysis is based on the Sudanese case and the centrality of land and water in the political ecology of the country, attested by the continual establishment of irrigation mega-projects. There are two main scenarios. In the first one, the state acts directly in the economic exploitation of natural resources; such outright involvement in the production processes can be realised with or without the involvement of private capital. In the second one, it offers preconditions to private investors by establishing a legal framework (for land concessions and exploitation rights) and by providing operative requirements (such as infrastructures and public security). In this way, the state is able to extract rents. In both scenarios the state's role inevitably changes. In the first case, it is a first-person producer of surplus value. In the second case, it collects income. These different strategies are both forms of an exercise of power that affects the organization of a territory. It is our focus to concentrate on the territorial outcomes of these two scenarios. By analysing the period from the Anglo-Egyptian Condominium to the present times, we were able to observe the changing attitude of the state regarding the exploitation of natural resources and the mobilization of capital. Our starting point is Scott's insight about the process that transforms inherited "thick" spaces into "state spaces": he defines the territorial outcomes as "thin spaces". We want to take a step further by presenting 'ultra-thin spaces', spaces that are suitable for mobile investments in the global market. In our perspective, ultra-thin spaces constitute the territorial outcome of a state which derives value by conceding control over natural resources and exploitation rights to others. This approach, taken from an historical perspective, analyses how the different relationships between state, capital and nature have had different outcomes in the territory. Even if applied to the specific Sudanese case, it serves as a means to more broadly understand this phenomenon constitutive of new global geopolitics where even the sovereignty of the state is being redefined.

1. Introduction

Starting from the early 2000s in Sudan, mainly in the River Nile regional state, agricultural enclaves have multiplied: huge spaces are put in the hands of foreign companies, especially those interested in the cultivation of fodder for the external market. The Sudanese state delegates the right to control these productive sites in a way that resembles an offer of 'pieces of sovereignty'. A new political model for managing space is established: investors have great margins of control over these areas. The Sudanese case is only one example, even if a very clear one, of an ongoing process that is reconfiguring economic and political assemblies on a global scale. The establishment of new enclaves controlled by foreign investors is rapidly reducing the extent of

spaces which were formerly excluded from relevant processes of commodification: they are now considered the typical spatial form of the new mode of capitalist land accumulation (Ferguson, 2005; Sidaway, 2007; Bond, 2008; Bush et al., 2011; White et al., 2012; Ince, 2014). These enclaves do not follow the logic of the modern territorial state, committed to the reinforcement of sovereignty, but rather that of a global economy that bases its existence on accumulation of profits to feed extremely mobile financial flows on a supranational scale: 'The result is not the formation of standardized national grids, but the emergence of huge areas [...] that are effectively "off the grid"' (Ferguson, 2005, p. 380). 'Holes' are emerging in the conceptually unified territory of the sovereign state (Sassen, 2013). Some scholars consider this as an uncoupling of sovereignty and state, that is, the

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emergence of states no longer sovereign, but rather victims of the unobstructed power of global capital, where sovereignty has, in a sense, ‘migrated’ (Brown, 2010). Others hypothesize a reality where sovereignty becomes ‘weak’ and ‘graduated’ according to the neoliberal rationality (Ong, 2006). Yet, other authors who claim that these enclaves fuel the ‘disassembling’ of the national territory and produce a new global political geography – where territory is bound to an authority that does not fall under its national competence – authors do not necessarily mean that it leads to a decline of the sovereign state (Sassen, 2013). Even though these investments may appear as a threat to sovereignty, they are not symptoms of an irreparable decline of the territorial state, but rather a new connection between local resources, sovereign state and global capital.

Our purpose is to better understand the proliferation of these enclaves, following two analytical lines: the first is to put the relationship between state, capital and nature in a historical perspective, in order to identify the elements of continuity and the aspects of novelty. The period considered, from the Anglo-Egyptian Condominium until today, allows us to observe how the attitude of the Sudanese state – from colonial to being independent – has changed regarding the exploitation of natural resources and the mobilization of capital. The second interpretative line aims to verify how the different balances between state, capital and nature materialize in various territorial outcomes.

In this way, our paper further intends to contribute to the present debate in the field of political ecology that has brought back into focus, once again, the role of the state in linking nature to the capitalistic process of value production (Loftus, 2017, 2018).

The state uses nature as a vehicle of accumulation by providing scientific, bureaucratic and material practices that make an environment economically legible and accessible. Moreover, the state transforms nature into resources by preparing legal instruments and cadastral maps for the assignment of property and exploitation rights as well as by guaranteeing fundamental infrastructures that make the exercise of these rights substantial. In the words of Parenti (2015, p. 830), ‘[c]apital’s metabolic relationship with non-human nature is always a relationship with the state, and mediated through the state. And, the capitalist state has always been an “environment making” institution. Managing, mediating, delivering, and producing the environment is a core and foundational feature of the modern, territorially defined, capitalist state’.

In fact, the sovereignty of the state is exercised on the surface of the earth within a precise set of spatial boundaries which become the container of its action: it is the state territory, ‘the site medium and outcome of statecraft’ (Brenner and Elden, 2009, p. 365). Inside its territory, the state has the power to ‘produce space’ (Lefebvre, 1991), that is, the mapping, intervening, changing and acting on space: the ‘making of environment’ is a particularly important dimension of this ‘geopower’ (Parenti, 2015). The management of natural assets (the process of discovery, cataloguing and extraction) is one of the tools made available to the state: (a) to assert its power over other actors, (in order to reiterate its sovereignty within its territory); (b) to organize territory according to its project; and (c) to strengthen the state economy (thereby, its own budget).

This strengthening of the state economic base can be achieved through the active involvement of the state in the production processes through a direct management of natural resources, with or without using private capital. Alternatively, this objective may be obtained indirectly, by extracting rents from the attribution of property and by granting exploitation rights to others. The position assumed by the state inevitably changes depending on its role: in the first case, it is a first-person producer of surplus value, in the second case, it merely collects an income. These different strategies are both forms of an exercise of power that affects the organization of a territory. Power is exercised in the first case by the state controlling the production. In the second, state power can still maintain a relevant function by distributing rents amongst the elite, thereby giving rise to the process of the creation of

consent.

A recent paper has focused on the increasing role of rent in the political ecology, proposing the concept of ‘value grabbing through rent’: Andreucci et al. (2017) indeed underline the importance of capturing value through rents within the dynamics of ‘accumulation by dispossession’ (Harvey, 2003). With this last concept, Harvey refers to the establishment of exclusive private property relations to assets that were previously not inserted within the social relations of ownership: in this way, these assets are made available to create value. Typically, accumulation by dispossession is exercised on the common lands (and the commons in general), which are then transformed into commodities, through processes of productive valorisation. Andreucci et al. (2017, p. 29) emphasize that ‘the central dynamic at play is the instituting of property rights that are not used exclusively or even mainly to produce new commodities, but rather are mobilized to extract value through rent relations’. This dynamic of rent extraction from environmental resources ‘is a distributional – not a productive relation’ (Andreucci et al., 2017, p. 35). The concept of ‘value grabbing’ is proposed by Andreucci et al. (2017) as useful in rendering visible these distributional relations and the related struggles over rent. The state is central in these processes (productive and distributive): it establishes property rights which are a pre-condition to private appropriation; it institutes the rules for the distribution of titles and decides the conditions of use; and finally, it guarantees the logistical and security conditions necessary for access to assets.

The state can therefore derive value from its control over space and non-human nature through different modalities: acting in the first person, that is, activating commodification of the commons with direct intervention that usually involves a deep transformation of the spatial structures, or its actions can be limited to extracting rents by allocation of land to the private sector.

This opens up the second analytical perspective. The different connections between state, capital and nature translate into different territorial outcomes, and, precisely, into thin and ultra-thin spaces. To this end, our analysis is based on the long Sudanese history of mega irrigation projects and the centrality of land and water in the political ecology of this country up to the present. Our starting point is the observations of J. C. Scott (1998) on the territorial strategies of the modern state. With the aim of increasing control over its territory, the state put into place a drastic simplification of previous ‘thick spaces’ (Scott, 1998), constructed by local communities over time in a continual process of adaptation with nature, giving rise to very specific, multifunctional and flexible forms of resources use. By selecting few productive variables (water and land, in our case), the state applied modern knowledge and technology in order to construct an exemplary organized space for production (irrigation mega-projects), although ‘short-sighted’ due to its lack of social, ecological and economical sustainability. The end result is the establishment of ‘thin spaces’, which Scott defines as fixed, monofunctional and rigid patterns of resource use. In doing this, the state had sought and used, in addition to internal capital, financing from abroad, such as funds for development granted by the international organizations or foreign investments. This was particularly true in the Sudanese case during the colonial period with England, and then it continued with the Gulf countries. However, with the development of ‘thin-space’, foreign capital had to act according to a scheme previously decided by the state and it could not produce space except within the national strategy (Hibou, 1999, pp. 41–56).

This situation has drastically changed in recent times. The African continent provides an exemplary context for observing the so-called ‘rentier states’ in action (Magrin, 2013): these latter are political regimes based on rent and, in particular, but not only, linked to extractive income (oil, gold and other minerals, forests, plantations, industrial fishing ...). In this way, they construct an economy almost completely oriented towards the export of raw material. Among the African countries that are adopting ‘rent-seeking strategies’, Sudan appears to be one of the most dynamic. Given the continual Sudanese activism in

searching for new sources of income as an alternative to oil after the succession of South Sudan (where oil wells were mainly based), Sudan now represents the ‘supreme stage of the rentier state’ (Magrin, 2013, p. 114). Indeed, it is a state that concentrates on the capture of rents from land concessions and water rights and from the extraction of gold (Chevrillon-Guibert and Magrin, 2018). There has been a shift from a developmental state directly engaged in the commodification of common lands to that of a rentier state interested in capturing value through rents. In order to facilitate the entrance of foreign investments in Sudan, a further simplification of space was put into place, delegating aspects that until then had been jealously considered part of territorial sovereignty. With this extreme simplification of state intervention and with the appearance of new agricultural enclaves in Sudan, it seems possible to identify a novel mode of territorialisation, which we propose to call “ultra-thin spaces”.

These ultra-thin spaces are characterized by very light infra-structural interventions when compared to the previous irrigation projects, thanks also to the use of irrigation techniques such as the central pivots. Foreign companies are given the maximum freedom of action, in exchange for financial income for the state. The main objective of the investors is to obtain surplus value and the investments are constitutively temporary, linked to the ever-changing profit margins within the context of the rapid evolution of the global markets.

In Sudan a parallel process emerges: on the one hand, there is a transition from a developmental state to a rentier state; on the other hand, the “ultra-thin spaces” appear alongside the old-style “thin spaces”.

To emphasize the differences, we considered it useful to accentuate polarities. In reality, this schematic idea should not be interpreted in a rigid way. The perspective of the interventionist state, which aims at full control of its territory, is only set aside, not forgotten. If the political and economic conditions were to return, the aspiration of the central government for a direct control of the territory remains. More than consciously planned choices, these are continuous adaptations of state strategies. Similarly, the different territorial outcomes coexist: irrigation projects on the ground may not precisely fit into one of the indicated territorial outcomes inasmuch as these are permeable categories dependent on their spatial and temporal contextualization.

The second section describes how the Sudan drylands were affected by the large-scale hydro-agricultural projects. In the third section, two examples of ‘thin spaces’ – the Gezira and Kenana – are presented, while in the fourth section the agricultural projects of the River Nile are analysed, thus illustrating examples of ‘ultra-thin spaces’. In the fifth section, the differences between “thin spaces” and the “ultra-thin spaces” are compared to propose an overall theoretical framework. In the conclusion, general observations about the role of the state are drawn from these specific case studies, in particular its links with capital and its relation with the territory.

2. Sudanese drylands transformed by irrigation: cotton, sugar and alfalfa

Sudan¹ is characterised by arid and semi-arid climates: agriculture was traditionally concentrated along the rivers (the Nile and its tributaries) fed by equatorial rain and the Ethiopian plateau. The rural areas far from the rivers – the drylands – were inhabited by a limited number of villages whose organization was based on customary rights that provided for the collective management of resources. The economy was based on nomadic pastoralism and, where possible, on rain-fed agriculture.

The drylands can be considered as ‘thick spaces’ (Scott, 1998). With this terminology, the spaces that are identified are the result of a

lengthy process of interaction between the environment, the economy and the society: these spaces are characterized by their own contextual set of human relations, knowledge and technical expertise, giving rise to a multiplicity of uses and resource management levels. Consequently, these spaces are hardly legible by external actors that have not participated in the process of constructing the ‘local’ (Magnaghi, 2000). In order to be able to freely access resources and to activate the developmental potentialities of land and water, the state needs to prevail over the particular customs that exist in the thick spaces. This was made possible by relying on a mixture of ‘technology, money, political commitment, and social control’ (Davis, 2016, p. 159) which called for a significant reorganisation and simplification of thick spaces in order to render them coherent to modern agriculture where possible (that is, where water resources – from river or groundwater – are available). This meant that the margins of local autonomy are reduced – or even eliminated – depending on the needs of an agricultural project. Because of this, the drylands are compelled to conform to the plans of the state, thus losing their ‘thickness’ and becoming instead ‘thin spaces’ that only take into consideration ‘a few schematic aspects of the inexhaustibly complex activities that characterize thick spaces’ (Scott, 1998, p. 261).

For colonial governments and foreign technicians (and then later by independent states), the drylands were viewed as empty spaces that needed to be revalued. Its inhabitants were judged as incapable of proper use of the land and ‘primitive’ in their use of available resources (Davis, 2016). Even today, the Sudanese drylands are still considered unproductive by government, technicians and investors and, consequently, made available for external projects that can utilize local resources ‘rationally’, producing crops for the domestic market and for exportation (Bertoncin et al., 1995; Awulachew et al., 2012; Mahgoub, 2014).

From the colonial period, one area between the Blue and White Nile was of great importance for the Sudanese economy: the Gezira. It was here in 1925, after the Sennar dam on the Blue Nile was completed, that the British inaugurated one of the largest irrigation projects in Africa. It was originally intended to produce cotton in order to deal with the crisis of the British textile industry and to cover the costs of colonial administration. After the construction of the Roseires dam (1966), followed by the Managil extension, the Gezira reached an extension of 2,2 million feddans² (Gaitskell, 1959; Barnett, 1977; Plusquellec, 1990; Bernal, 1997; Yousif, 1997; Salman, 2010; Ertsen, 2016).

After independence in 1956, the Sudanese state was concerned not only with the expansion of the Gezira, but also with the installation of the Rahad scheme on the right side of the Blue Nile and with the promotion of large-scale agricultural projects to produce sugar cane and sugar cane factories (Gunied, New Alpha, Kenana, Assalaya, Sennar, and, the most recent, the White Nile). Five of the six factories are situated around the Gezira and comprise what is referred to as the Sudanese ‘sugar belt’ (Desai and El Tigani, 2007; Bertoncin et al., 2017). The Kenana Sugar Company (KSC) is the most important producer of sugar in the country. It is located south of the Gezira and is irrigated with water directly from the White Nile. This project was built in the Seventies thanks to a massive investment from the Gulf states whose intention was to make the Sudan the ‘breadbasket of the Arab world’ (Kaikati, 1980; O’Brien, 1981; Beblawi, 1987; Elnur, 2009; Woertz, 2013) and, specifically for sugar, the ‘Cuba of Africa’ (El Nazir and Desai, 2001).

In the 2000s, with the regime of Omar al-Bashir (in power since 1989), the strengthening of relations between the Sudanese state and the Arab capital in the field of agriculture was consolidated. From 1989 to 1999, economic pragmatism was suffocated by the strict adherence to Islamic principles in the conduct of economic affairs. With the expulsion of Islamists’ leader Turabi from the government, al-Bashir was able to press the accelerator on liberalizations and business-friendly

¹ First-hand knowledge about Sudan derives from research in the field (2010; 2014; 2016 and 2018).

² 1 feddan = 0,42 ha. Feddan is the unit of measure used in Sudan.

policies, explicitly directed to meet the needs of the Gulf countries (in agriculture) and the Chinese allies (oil and infrastructures). The government activated the ‘agricultural revival program’: a political manoeuvre between the high authorities of the Sudanese state and Arab states. The National Investment Encouragement Act of 2013 – which is still valid – represents the culmination of this path that has mainly facilitated the neighbouring Gulf countries (Verhoeven, 2015; Musso, 2016). The effects can be observed in the regional state of River Nile north of Khartoum. In the drylands, foreign investors established agro-industrial projects mainly aimed at producing alfalfa (*Medicago sativa*) for exportation to Gulf countries’ markets.

The evolution of the different hydro-agricultural phases in Sudan can be observed through the production of cotton, sugar and alfalfa. The large-scale projects, which radically transformed the drylands, were driven by the international need for these three potent products and, consequently, by the conjunctural combination of the capitals interested in satisfying it. In fact, the strategic value of cotton, sugar and alfalfa was tied to global economic dynamics and to a relevant socio-technical evolution in terms of production, processing and logistics. Cotton played a key role in the first industrialization and establishment of the British economy on a global scale. Sugar, which is fundamental to the Sudanese diet, assumed a role of significant political importance. Although it became a product of consistent value for exportation, it also presented a possible risk of popular discontent if there was a scarcity on the domestic market or an increase in price. It has always been a priority of the Sudanese government to assure enough supply for the population. Lastly, faced with water scarcity and the need to safeguard their scant groundwater, in recent times Saudi Arabia and the EAU have decided to outsource their own agricultural production by taking advantage of bureaucratic and financial facilitations promoted by the Sudanese state: alfalfa production in Sudan has become of absolute importance. From both a geographical – it is ‘near’ – and political point of view, the fodder produced in Sudan is critical for their dairy industry. Foreign enclosures continue to expand, ever encroaching on marginal thick spaces, configuring a new model of territorialisation: the ultra-thin spaces.

3. ‘Thin spaces’ in Sudan: case studies of cotton and sugar production

3.1. The Gezira

Since the early years of the twentieth century, the British colonizers decided to promote the extensive cultivation of cotton in the Gezira (Fig. 1). In fact, the colonial administration of Sudan needed to gain some profit in order to finance the administrative costs of imperialism. Moreover, the former believed that the establishment of a productive cycle capable of involving a multitude of individuals would have certainly constituted an excellent opportunity to integrate the local economy within the economic circuits regulated by the state. For the colonial administration, it was necessary to search for capital that could be used for the realization of a great agricultural project. It was an arduous challenge: London initially did not grant any loans to the British officials in Sudan. Indeed, it was frightened by the huge dimension (and related risks) of the agricultural project that was to be built.

However, the British Cotton Growing Association, an industrial organization founded in 1902 and aimed at promoting cotton production in the British Empire, was at the same time seriously concerned by the failure of some crops managed by the Empire in America and Egypt. The potential threat was that of not being able to produce enough cotton for the manufacturing industry in Lancashire during a period of high demand (Barnett, 1977; Pase, 2011).

The colonial administration did not consider the possibility of relying on private investors for implementing its agricultural mission. It was believed that the intervention of capitalists could lead to financial

speculation and stimulate land commerce, consequently weakening the colonial attempt to control the population through a strictly regulated land allocation. The preoccupation of colonialists with foreign capital ceased to exist only in one case: this exception took place because an investor (Leigh Hunt, founder of the Sudan Plantation Syndicate) was able to present himself to the colonial administration as ‘a capitalist with both the resources for and the genuine intention of development’ according to state planning (Gaitskell, 1959, p. 51).

In 1911, at the site of Tayiba on the Blue Nile, the first hydraulic pump of the Gezira was opened by the Syndicate (SPS) to irrigate about 2000 feddans. The SPS was asked to apply a tenancy system that consisted of allocating 30 feddans of land to each person involved in cotton cultivation. This latter proved to be such a successful system that many natives asked to participate in the project. Consequently, expansion of the project was necessary with a subsequent increase in land allocations. Because of the highly successful production of cotton, in 1914 Sudan received its first loan from the British government and was able to start construction of the Sennar dam, thus accelerating the expansion of cultivated areas by means of an enormous hydraulic system (ivi, pp. 72–3). This was the real beginning of a transformation process that will lead to the imposition of thin spaces in large areas of Sudan.

The Syndicate had many responsibilities: the maintenance of roads and the drainage system; the cleaning of subsidiary canals; the levelling of land; the payment of the managerial staff and the workers involved in the fields; the purchase of machinery; and finally, the construction of houses for employees, offices, warehouses and industrial warehouses. To perform these tasks the Syndicate was entitled to 25% of the profit made from the sale of cotton. The state, on the other hand, assumed the costs for the construction of roads and the primary channels, yet they retained 35% of the profit. Finally, the tenants were only instructed on how to grow cotton. The tenants’ earnings accumulated in a collective account of 40% of the profit. However, this percentage included the costs of agricultural assistance carried out by the Syndicate (land preparation, delivery of cotton seeds, fertilizers and bags for collection, spraying of pesticides, loans for the recruitment of labour, the cost of energy for operating the machinery for ginning and packing of cotton, and, ultimately, the transportation of the goods to Port Sudan for export) (*op. cit.*).

With the independence of Sudan, Gezira underwent two important modifications: the management of the project came into the hands of the Sudan Gezira Board, a new institutional body (the SPS was not compensated at all, its contract terminated in 1950); and the cultivated area was further increased through the Managil extension after the construction of the Roseires dam in 1966. Both were financed by the independent state of Sudan (Wallach, 1988; Bicciato and Faggi, 1995).

Thanks to the ample water availability, in the following years the project extended to 924,000 ha constituting what has been called ‘Africa’s most impressive man-made landscape’ with its 150,680 km of canals fed by the Sennar e Roseires dams (Chambers, 1969, p. 19) (Fig. 2). Moreover, it started contributing consistently to 35% of the Gross Domestic Product, producing about the 60% of Sudanese cotton thanks to 130,000 tenants (Plusquellec, 1990; Eldaw, 2004; Salman, 2010).

The Seventies in Sudan were a decade of great political upheaval. Leftist forces led a *coup d’etat* in 1969 (Holt and Daly, 1979, pp. 195–215). The new government was run by Ja’Far al-Nimeiri and was inspired by socialism. The increase of public presence in the national economy was instantaneous: banks, agricultural projects, businesses industrial and commercial companies were nationalized (Elnur, 2009, pp. 40–2). Gezira was not excluded: ‘[t]he Gezira scheme [...] lost its autonomy not only in financial affairs but in the administrative affairs as well. In fact, there had been steady interference from the state in the internal affairs of the scheme which eventually was reflected on the general performance of the scheme and, consequently, on crop production (Yousif, 1997, p. 194).

In 1971, a failed coup attempt against Nimeiri by some Communist

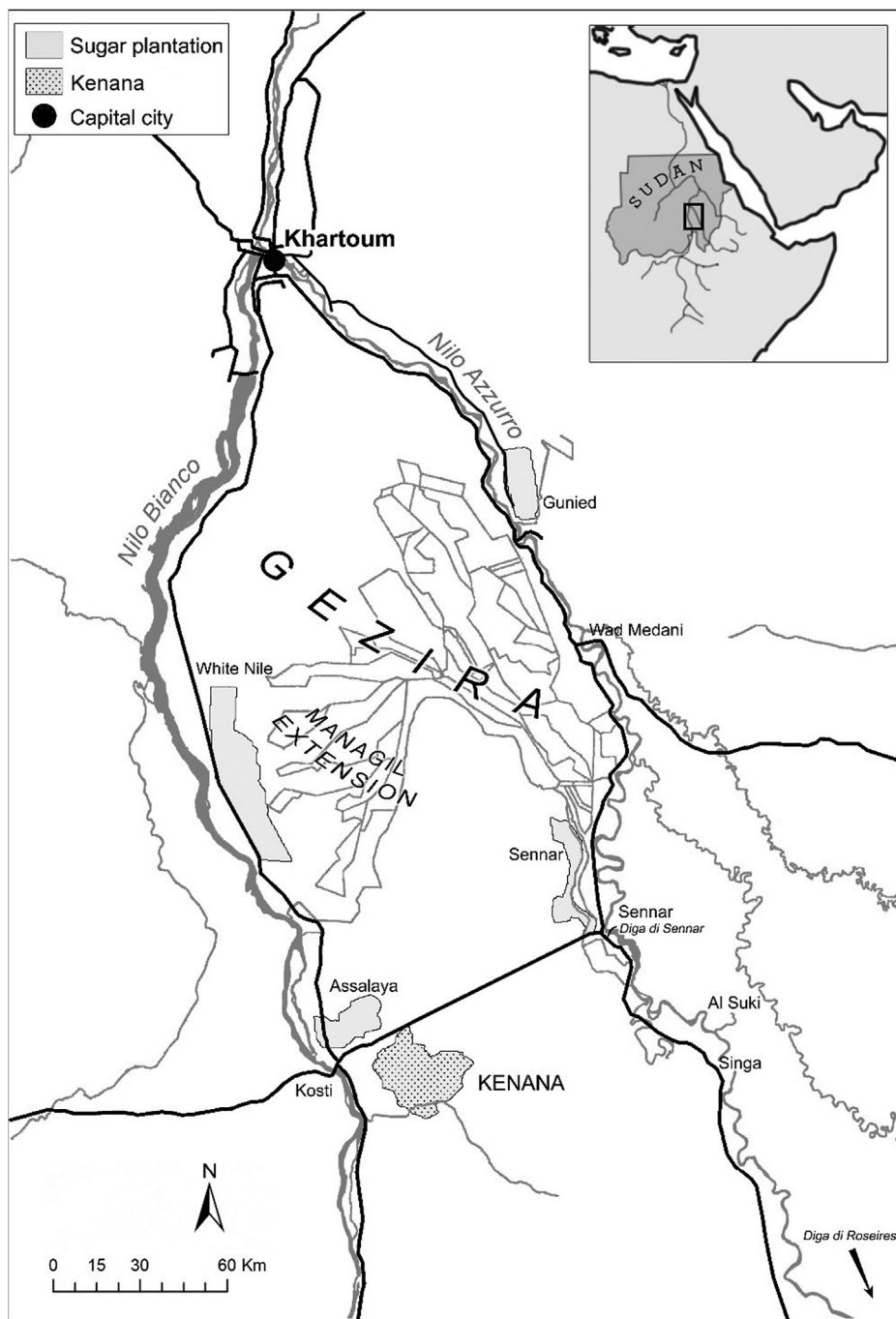


Fig. 1. The Gezira and the area around it where other extensions dedicated to the cultivation of sugar cane emerge, including Kenana. Graphics provided by Stefano Turrini with support of Francesco Ferrarese, GIS Lab, 2017.

officers radically changed the political equilibrium inside the government. Nimeiri abandoned his old socialist allies and, subsequently, instated a conservative approach typical of monarchies of the Gulf (Wai, 1979).

In the same period, the price of cotton dropped due to the commerce of synthetic fibre (Barnett, 1977). Profit diminished drastically, and, as a consequence, the maintenance of the project worsened: communication network and transportation routes were less efficient, and the railway system collapsed almost entirely. Only a few lines remained active and, in any case, at a reduced capacity. Even the efficiency of the irrigation system was no longer properly monitored: many lands stopped being cultivated while others were irrigated improperly. The productive inefficiency of the perimeter and the progressive reduction

in profits brought down the controlling capacity of the SGB and its staff. Farmers respected less the authority of the SGB and began to transgress its directives. The state decided to withdraw from the Gezira inasmuch as it was no longer willing to spend money and energy on rehabilitation.

The IMF together with the World Bank intervened proposing a handover in the management of the scheme from the weak Sudan Gezira Board to the tenants. After a slow transformation in this sense, it was only in 2005 (with the Gezira Act) that the tenants' autonomy was fully accepted (Salman, 2010). Thanks to the reform, tenants were recognized as farmers and as property owners. Many farmers – those having some money to invest – even became agricultural entrepreneurs. They are now able to express their voice about the methods used in the



Fig. 2. The Gezira (detail of the Managil extension). Graphics provided by Stefano Turrini and Silvia Piovani, 2017.

production cycle (for example, autonomously managing portions of the hydraulic system, diversifying cultivation, integrating agriculture and cattle breeding, buying and selling the land); and are active in the commercialization phase (for example, autonomously setting up marketing relations with merchants and clients). The only problem – a relevant one – is the fact that availability of water for cultivation remains in the hands of a complex ministerial bureaucracy that manages the Sennar and Roseires dams and who would like to continue to supervise the irrigation scheme, however without a serious government commitment.

Nevertheless, autonomy seems to be consolidated. Farmers are by now able to propose their own conditions: the state and foreign capitalists are forced to accept that they cannot operate in Gezira as omnipotent actors capable of reducing again the ‘thickness’ of the new local dynamics.

3.2. Kenana Sugar Company

Because of the vast availability of water and excellent soil, during the 1970s attempts were made to transform Sudan into the ‘breadbasket’ of the Arab world, extending the area of cultivation and range of crops with the dual scope of creating both an internal and external market (Kaikati, 1980; O’Brien, 1981). After a series of irrational investments, difficult economic situations, unfavourable environmental

conditions (the great Sahelian drought of the Seventies), and social conflicts (between pastoralists and farmers), the strategy of ‘the breadbasket’ failed (Elnur, 2009; Verhoeven, 2015). The only successful survivor is the Kenana Sugar Company (KSC) (Fig. 3). It is an international public-private joint venture comprising capital from the Sudan (35%), Kuwait (30%), Saudi Arabia (11%) and – to a lesser extent – from other public and private actors (Woertz, 2013). Its geographical position made it possible to connect on an east-west axis (Kosti/Sennar) and south-north axis (Kenana-Khartoum-Port Sudan), together with access to the water of the White Nile. Kenana began in 1981. The construction of the hydraulic infrastructures took eighteen months: they had to install the pumping stations (six in total) to lift the water and defeat the difference in height and to build the main canal (40 km) and its long ramifications (400 km), where water was conducted by gravity.

Nowadays, Kenana produces 4 tons of sugar per feddan; a third of the product, the best part, is exported. The project extends to 168,000 feddans – although the commercial part is 83,000 feddans – and is innervated with canals and hydro flume that transport water taken from the White Nile. The ‘hydro flume’ technology consists of a system of flexible pipes positioned at the height of the terrain which then carry water to each field. When the PVC tubes are not conducting water, they remain empty on the ground. On the other hand, when they transport water, they expand until they assume their characteristic circular form.

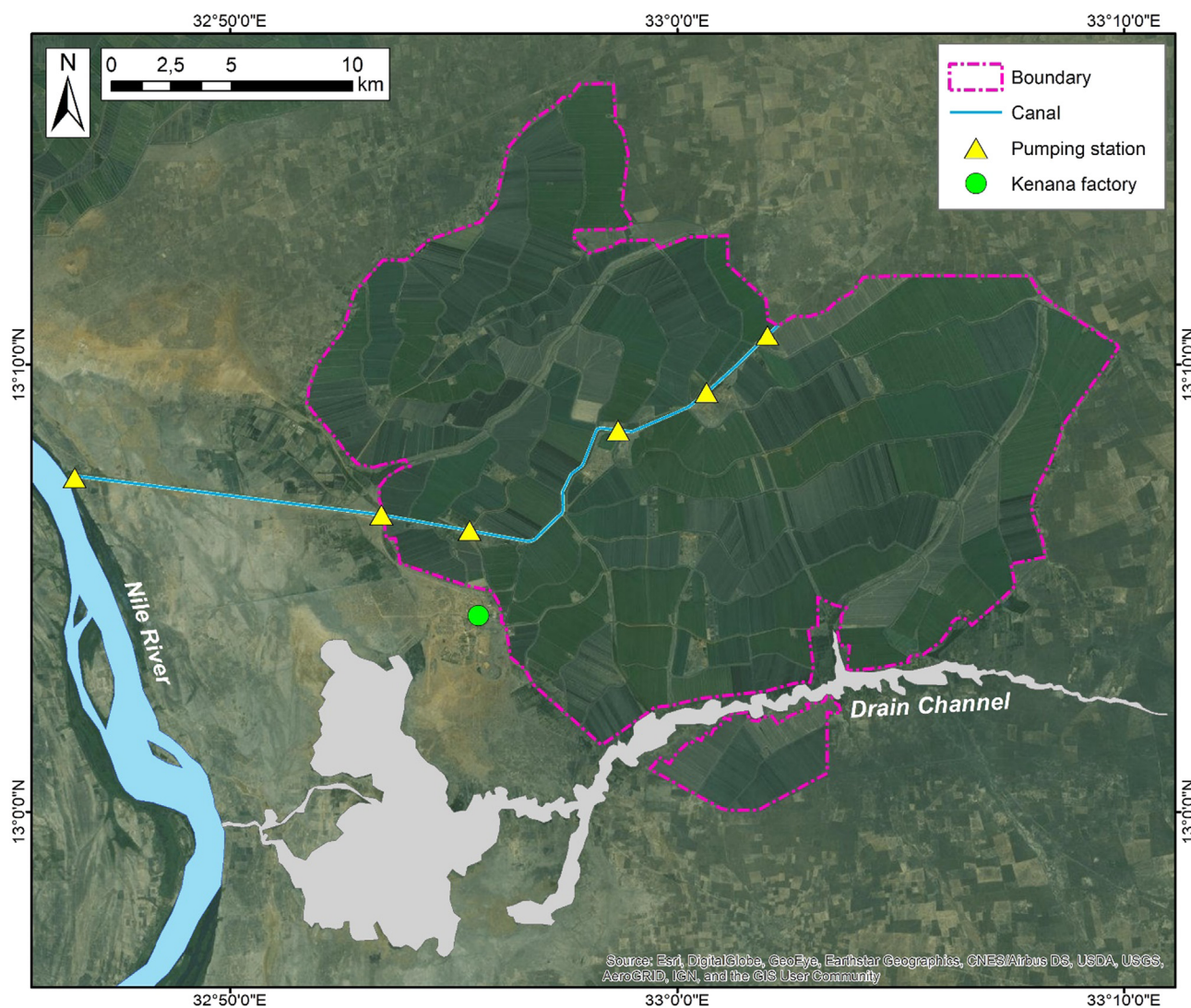


Fig. 3. Graphics provided by Stefano Turrini and Silvia Piovani, 2017. The Kenana Sugar Company.

The efficiency of the hydro flume is dependent on maintaining pressure inside the pipelines. There are many advantages to this technology: space can be recuperated (instead of a canal or an embankment, there is a plastic tube); less time is needed for construction or maintenance of the canals; water is saved (loss due to infiltration and evaporation is reduced); and infestation from weeds is avoided. Nonetheless, this technology also entails a precise levelling of the land with laser technology and constant maintenance, thus, a consequent increase in cost.

The construction of Kenana drastically changed the path of development in the local region, leading it to evolve from a thick space to a thin space. It was a radical innovation so diverse from the previous social and economic models which were based on traditional activities such as transhumance and rain-fed agriculture. The name 'Kenana' retains a trace of a past nomenclature: 'In Arabic, "Kenana" means something like "granary", but the name was taken from that of an ancient tribe which travelled from the Arabian Peninsula and settled in the area now occupied by the Kenana Project. Though small in number, they were prosperous, living close to the Nile and having already markets [...] for their herds of cattle and sheep' (Desai and El Tigani, 2007, p. 39). The local community that had previously lived there were forced to relocate to villages built by the company or in nearby villages. The various groups involved in this process lost their traditional settlements, land rights, and their source of livelihood: grazing and fields for rain-fed cultivation. In an interview (Worldfolio, 2014), Mohamed

Elmardi Eltigani, Managing Director of the Kenana Sugar Company, defended this manoeuvre: 'We have provided a win-win model between our investors and the environment and the locals. [...] Before we built the sugar factory, we built houses, schools and hospitals for the people living in the project area and around it. Kenana is a modern city in Sudan created by the company. Everything is built by the company, so the developmental and social aspects come with the industry. Because we operate in remote areas, Kenana has been a very effective tool for rural development'. The company built schools (primary and secondary), health centres, roadways within the project and connections to the principal transport systems. It also created access to an electrical power grid and potable water distribution (such as aqueducts, tanks in villages, weekly transportation in containers). In addition, there were opportunities for work directly within the production process (in the fields and in the sugarcane factory) or indirectly in commercial activities to satisfy the needs of the workers and their families. In the larger villages near the perimeter, important food and consumer markets were developed specifically for the employees of the company. However, the number of people employed within the project is constantly declining because of the ever-increasing mechanisation of production. Services offered to the local community are dependent on the number of workers that are employed by the company: if there are less employed, fewer benefits are offered to the workers (Bertoincin et al., 2017). What makes it even more serious – considering that the KSC limits traditional

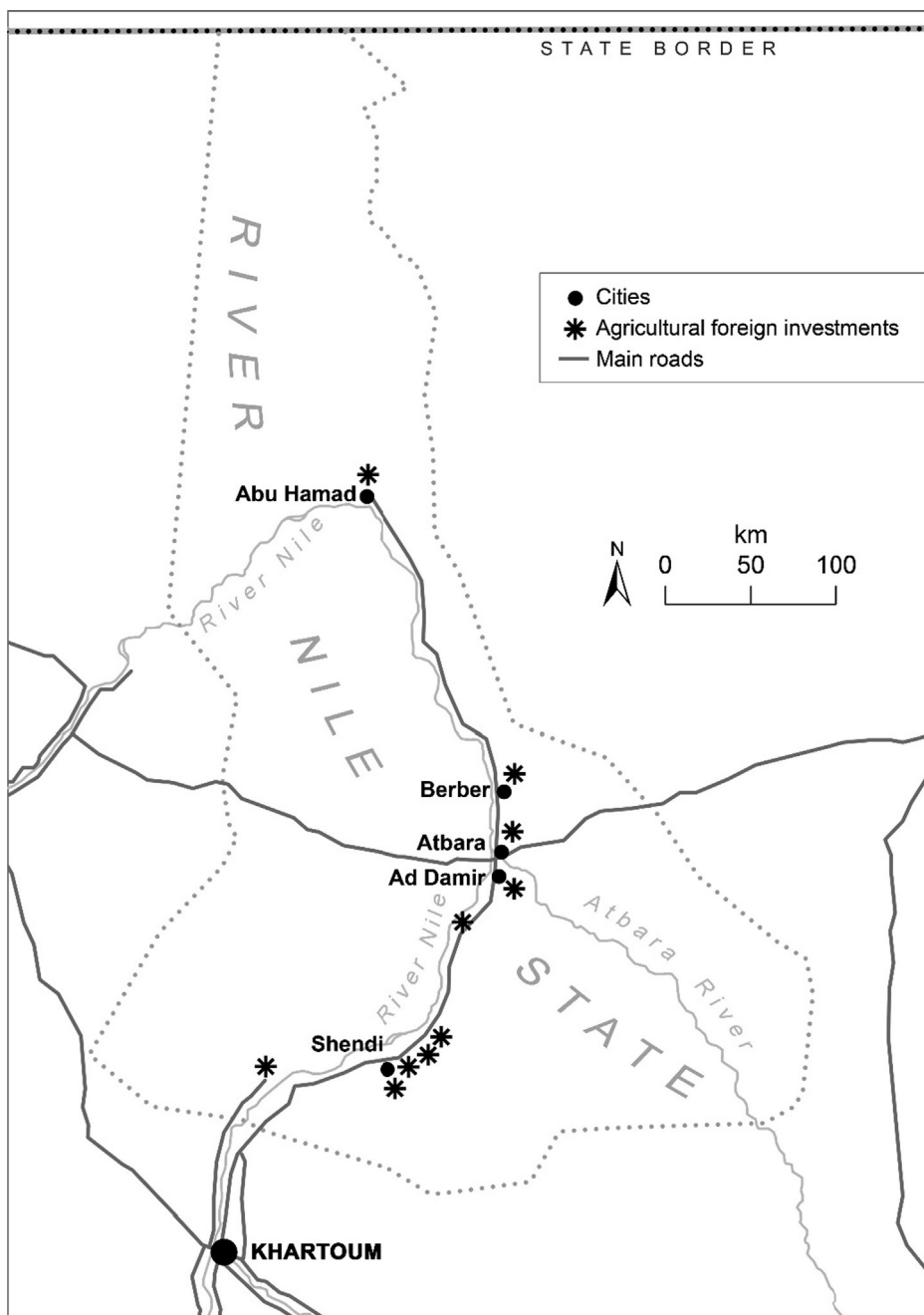


Fig. 4. The River Nile State of Sudan, principal cities and the main agricultural investments: GLB Invest (orographic left of the Nile north of Khartoum, El Matamma region); Temanco Twins Company, Crown Steel Agricultural Project, Alkear Project, Tala Investment Corporation (Shendi region); Bashair Project, African Malaysian Company - Akasha (Ad Damir region); Al Rajhi International for Investment - RAII - Kafa'a Project development (Atbara region); AAAID and Rawabi Co. - Arab Company for Crop Production (Berber region); further north, in the Abu Hamad region there is still the AAAID with the Abu Hamad Wheat and Feed Production Project. Graphics provided by Stefano Turrini in collaboration with Francesco Ferrarese, GIS Lab, 2017.

economic activity – is that the inhabitants were forced to abandon cattle herding and rain-fed agriculture in order to look for work in this agro-industrial development. This created a dependence on the company and now the workers risk becoming ‘surplus people’, with access excluded to the perimeter and deprived of an alternative income (Li, 2011).

In time, internal conflicts grew and, consequently, the production cycle was affected by damage to the pipes (PVC cut either by wandering animals or deliberate acts of sabotage by pastoralists who were excluded from the project or from dismissed workers who seek revenge towards the company). This resulted in a consistent loss of water and had negative repercussions for cultivation. Trespassing of herds, which was absolutely prohibited, increased in the peripheral areas which were less controlled. The costs are enormous and, as with other sugar companies, had a severe impact on the budget. Pastoralists are considered ‘enemies’ that ‘invade’ and ‘conquest’ the land of the project (these are terms used by the management of Kenana). As a solution, sentries are

called upon to oversee the fields to keep away the herders and their cattle. Conflicts also arise due to pollution. During the intense period of operation of the sugarcane factories from November to May, burned filaments and black dust cover and invade every space. Many citizens are stricken, sometimes severely, with illness because of pollution. Discontentment by the population is increasing, causing damage to the company’s reputation which by now is considered guilty of promoting ‘wastelanding’ processes. ‘Wastelanding’ is defined as maintaining an activity that is harmful, even to the point of sacrificing the local population to the altar of profit (Voyles, 2015).

Gezira and Kenana are the principal cases of thin spaces in Sudan, in terms of size and socio-economic impact. Through their analysis, we are able to understand how the transformation of large portions of drylands from thick to thin spaces has taken place and how thin spaces concretely operate.

4. 'Ultra-thin spaces' in Sudan. The case for alfalfa production

Ultra-thin spaces mark a new phase in the relationship between state, capital and natural resources. They are the territorial outcome of this recent step: investments, especially foreign ones, are aimed only at the extraction of value, in the form of production of crops to be sold on the international market. There is no longer an idea of transformation of the society and a long-term development perspective, as it happened in thin spaces: now the time horizon is always shorter, depending on the rhythms of global markets. A special irrigation technique based on central pivots facilitates the proliferation of these ultra-thin spaces and makes them clearly legible in the territory.

The appearance of 'ultra-thin spaces' in Sudan began in the early 2000s, when the regime began offering land and water at favourable conditions to the Gulf countries, in order to rebuild diplomatic alliances weakened in the previous decade because of Sudanese support of the Iraq's invasion of Kuwait and hospitality granted to various jihadist movements, including armed ones. These countries were starting to experience the reduction of their water resources, due to their excessive over-use. Their domestic production was then outsourced. The rush of the Gulf countries in grabbing farmland in Sudan was accelerated following the food price crisis of 2008: many exporting countries began to reduce the quantity of food commodities on the foreign market, preferring to guarantee food security for its population. Despite the considerable spending power of the Gulf countries in the exportation of oil (Beblawi, 1987), they were still unable to assure adequate access to food for their population. For this reason, Sudan still maintained its function as a 'food target' (Woertz, 2013; Keulertz and Woertz, 2015).

The involvement of the Gulf countries in the economy of Sudan was favoured by another event: in 2011, the secession of South Sudan was a shock for the national economy (CJ, 2006; Ahmed, 2011; Elbeely, 2013; Abdalla, 2014): Khartoum lost control of most of its oil fields (about 75%). These are now under the control of Juba, the capital of South Sudan. The North had to adapt itself to the new situation. Given the necessity to diversify its own financial revenues, in 2013 al-Bashir approved a new legislation for investments (the National Investment Encouragement Act, 2013) in order to vigorously attract foreign investment to Sudan by offering remarkable tax exemptions and strong bureaucratic support to investors (Hassan, 2015; Unctad, 2015).

The territorial consequences are clearly visible north of Khartoum in the state of River Nile. Since the 2000s, this regional state of Sudan has experienced the expansion of agricultural projects for exports, an expansion that became rapid following the 2008 crisis and was strengthened 2013 with the promulgation of the ultimate business-friendly legislation (Fig. 4).

The large-scale projects examined were carried out primarily for the agro-industrial production of alfalfa. This crop is considered 'the queen' among fodder because of its high productivity and nutritive value. In the area under analysis, it is possible to harvest ten times per year: crops are reaped every 30–35 days with an average production of 2 or 3 tons per hectare. The fodder is mainly exported to Saudi Arabia and UAE for industrial farms. These countries are outsourcing their agricultural production due to lack of water. Since the local production of fodder is diminishing, Saudi Arabia and the UAE are becoming the largest importers of alfalfa in the world together with Japan, South Korea and Taiwan (Keulertz and Woertz, 2015). The Arab market needs about 20 million tons of alfalfa and only a small portion of it is currently produced at the regional level: the Sudan produces 5 million tons. The possibility for expansion of alfalfa cultivation in Sudan is enormous. For this reason, the Ministry of Investments is presently preparing feasibility studies for future alfalfa projects (SudaNow, 16 July 2017).

For Sudan, offering land means gaining international consensus, access to new markets and technical innovations, and, most importantly, new sources of revenue through rent that could reassure the continuation of the regime. For the private investors, it means making sizeable profits by a hosting country that legitimises their agricultural

activity. The most recent legislation in Sudan is 'rendering land investable' (Goldstein and Yates, 2017; Li, 2017). It declares the need for granting vast extension of land to private investors for their production purposes. The advantages for investors in terms of financial, administrative and bureaucratic support are considerable, even if they often must pay for a portion of land larger than that which they can cultivate. For example, some of these benefits include: any materials and tools that are imported and declared as needed for the installation of a project are exempt from taxes (in reality, other products that have nothing to do with the project are often introduced in Sudan without paying taxes so that they can turn a profit on the Sudanese market); the investor can modify the purpose of the project even after the land has been allocated; and the original area of the project can be lengthened. Moreover, a system of 'one stop shop' has been established whereby investors when acquiring land and installing a project can combine all their transactions with one single institutional procedure. These advantages have been institutionally granted by the National Investment Authority which came into force under the National Investment Encouragement Act 2013 (the NIA then became the Ministry of Investment after the Presidential Decision No. 32, 2015). Also, in 2013, informative material was circulated with the ultimate scope of describing a national territory able to offer broad margins of economic flexibility to investors in publications such as the 'Investor's guide', 'Procedures Manual' and the 'Directory of Proposed Investment Projects' (NIA, 2013a, 2013b, 2013c). These documents underlined the unlimited availability of land and water in Sudan, stressing that water withdrawal from the Nile river and from the ground are free and not subject to restrictions. Frequent claims of 'the sun that kisses the Sudanese territory' conveyed this idea of a climate that is ideal for agricultural exploitation.

Furthermore, the local territory made available for private concessions by the state describes the land as 'marginal', not yet active in either commercial or production circuits, in other words, free from any possible future obstructions that could hinder the installation of a large agricultural investment. In order to ensure that the idea of 'marginality' is not understood as 'inoperative' – or 'hostile' – the local nomadic-pastoral community is described as 'folkloric' and with few members; thus, it could be easily uprooted because of its nomadic nature. Finally, they guarantee an efficient network of roads: the north-south axis connects the agricultural schemes with the capital of Khartoum, while the east-west axis facilitates the transportation of goods to Port Sudan. From here they are transported abroad, principally towards the Gulf countries but also to Asia (Keulertz and Woertz, 2015).

The agricultural projects considered (with dimensions varying from 2000 to 100,000 ha) are irrigated with central pivots. Central pivot irrigation is a method for crop irrigation in which equipment powered by electricity rotates around a pivot and crops are irrigated with sprinklers. A circular area centred around the pivot is irrigated, often creating a circular pattern in crops when viewed from above. This technique does not require grading or a deep cleaning of the land (just a minimum of levelling that allows the equipment to move). The removal of stone chips and vegetation is quick and economic, and the horizontal surface of the soil is not depleted. The central pivots can vary in size, the most common ones capable of irrigating 150 feddans. This extensive mechanization of the production cycle does not require a high number of labourers. Hydraulic engineers and agronomists organize the production while specialized staff are responsible for operating the farm machinery and its maintenance. The more qualified staff are from abroad: the engineers are Pakistani, Saudi Arabian and European, while the less qualified workers are Sudanese but also Egyptian, Kenyans, South Africans and Filipinos. The promise of jobs advertised by the companies is generally not respected. For example, GLB Invest originally declared that they would hire 2400 people living in the rural area near the project, but it currently employs (including engineers and simple workers; permanent or 'on call') a total of 120 people, 90 of whom are Sudanese (Fig. 5).

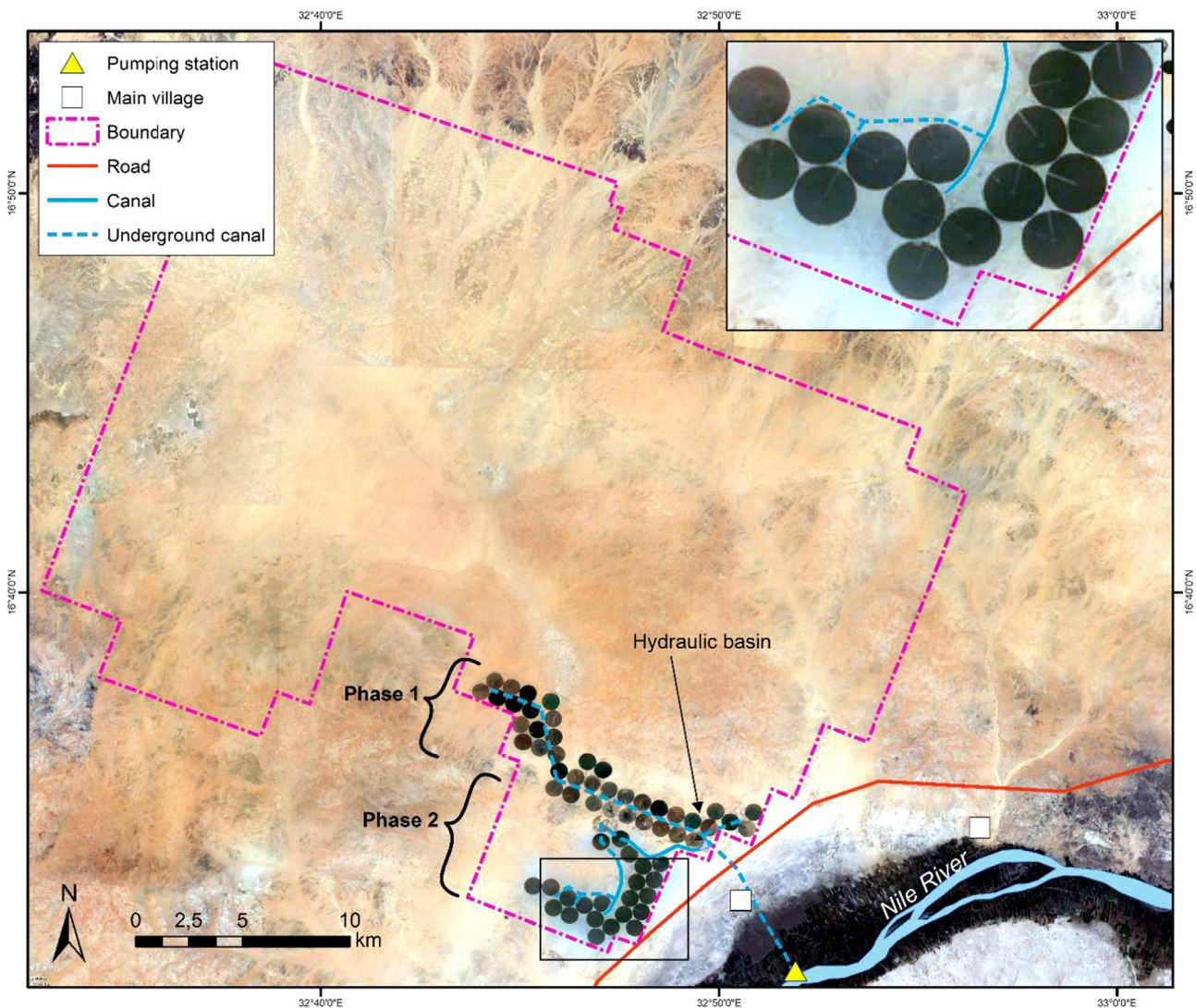


Fig. 5. “Green circles” cultivated by pivots in the Lebanese investment group GLB Invest (region of Al Matammah): the lines tracing the delimitations of the land purchased by the investor are based on information collected during field research, partial data available at www.glbinvest.com (last access on 24 November 2017) and digital information obtained with Google Earth. The delimitation lines provided by us have an indicative value only. Sources: Graphics provided by Stefano Turrini and Silvia Piovan, 2017. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

Located 130 km north of Khartoum, this investment is one of the largest projects using central pivots for alfalfa production. It was established in 2011 in an area not far from Qawz al Habashi. The Sudanese government stipulated a 99-year renewable lease for 87,200 ha of land. In order to guarantee access for irrigation, the investor is granted a long strip of land along the Nile (300 m × 200 m) where a pumping station is installed. This is connected to a hydraulic reservoir which is linked to underground fiberglass tubes (GRP pipes) running along a corridor of land (7 km × 50 m) explicitly purchased for this purpose by the investor. In 2014, Phase 1 of the harvest began with 40 pivots. The following year 23 pivots were added (Phase 2). The investor’s objective was ultimately 1000 pivots in order to increase exponentially the production and exportation of alfalfa (the primary cultivation is rotated every two years with cultivation of Rhodes grass and sesame). GLB Invest has its own 5000 m² warehouse in Port Sudan.

Another great protagonist of the new agricultural frontier in Sudan is RAAI (Al Rajhi International for Investment), a Saudi company that has many agricultural projects not only in this country, but also in Saudi Arabia, Egypt, Ukraine and Poland. It is also planning to expand in Mauritania. Its major project in Sudan is that of al-Kafa’ah – which means ‘efficiency’ – and is where its first crops were cultivated in 2009.

RAAI acquired 50,000 feddans in the Berber region where it has 140 pivots and mainly cultivates alfalfa and Rhodes grass. However, the biggest acquisition of land is that of Moawia Elberier, a multinational conglomerate of 30 companies. In Sudan, Moawia could potentially cultivate 480,000 feddans. Yet currently, projects activated by Moawia do not fully cover the available extension and are relatively small.

Management of these investments is not as easy as it would seem. The smooth and simplified territorial description that the government offers to foreign investors often is not necessarily verified by the facts. For example, to access water from the river, investors need to acquire the strip of land that connects their project to the Nile. This manoeuvre is neither simple nor economic. In fact, negotiations with land owners along the river are often complicated. When they are successful, underground pipes or canals are installed for conducting the water from the pumping station on the banks of the Nile to the project which, however, could be many kilometres from the river. Due to the distance, there are many cases where different levels between the project area and the pumping station are relevant. This requires the use of additional oil-fed intermediate pumps to efficiently transport water to the agricultural project. For example, the difference in level is 8 m for the Arab Company for Food Production and 45 m for the Saudi Tala project.

Confident and trustful of whatever technical information (very little) is provided by the Sudanese, many investors do not bother to request independent feasibility studies. As a result, they are faced with a considerable increase in cost after work has already begun in preparing the land. In general, during the process of land designation, the local conditions are often not taken into consideration. While preparing the land for cultivation, problems arise regarding the composition of the soil or water consumption. Often the soil does not reflect the acclaimed fertility, or rather it does not reproduce as quickly as needed for agro-industrial production.

At the start of agricultural production, it is necessary to resort to suitable pioneer crops to invigorate the land, combined with massive quantities of fertilizer and herbicides; otherwise, it would be impossible to support an intensive monoculture. As for the groundwater, it is only after the investor starts digging wells (generally between 100 and 140 m) that he realizes that the water capacity is less than what was expected. Moreover, the water in the subsoils has a higher saline content than the water from the Nile, an element that not only affects the proper functioning of the pumps but also the quality of the crops. Sand also represents a significant problem. Just as the salt diminishes the efficiency of the irrigators, the muddy terrain residue in the pivot pipes damages the irrigation system. The micro-fine sand that accumulates during sandstorms seeps into the mechanical and electronic devices and, consequently, affects the correct operation of the machinery. Obtaining spare parts is very difficult: the local market does not have enough quality replacements. For this specific reason, the Tala investment (in the region of Shendi) sustained serious losses, eventually halting the operation. Another highly disruptive factor is the debris caused by plastic (nylon bags) – now pervasive in the local landscape – which the wind transports and then gets tangled in the crops. In fact, before the harvest, all the workers are called upon to remove the rubbish from the fields because once the crop is packaged, extracting the plastic would be impossible. Clearly, it would affect the value of the goods. Electrical power cuts are ever more frequent and constitute a threat in all phases of production: whoever wants a stable electrical source of power must invest in costly oil generators. Consequently, for all practical purposes the ‘roughness’ of the territory impacts on the ultra-thin spaces: it is not simply a matter of ‘placing’ hydro-agricultural projects on the land without having any feedback or without ‘contamination’.

If the technical-productive aspects are affected, relations with the local community are even more so. Regional authorities may ask the investors to provide compensation for reducing customary land rights. Compensation often is in the form of goods and services (a school, a mosque, a clinic, temporary and/or payment to access wells) in order to gain consensus of the local population because of land appropriation to foreign investors. Since 2013, the National Investment Authority (NIA) requests that private investors allocate 25% of their land acquisitions to the local community. As a result, the new investors request at the time of purchase 25% more land so that they can acquire the amount of land needed. Nevertheless, the reallocation of land is sporadic both for problems of identifying members of the ‘local community’ – particularly because they are nomadic or semi-nomadic – and bureaucratic delays (Hassan, 2015; Unctad, 2015). The fact of requiring compensation reveals an important fact: the territory is ‘alive’, not just a commodity. Indeed, ever since the beginning of the investment projects, boundaries have proven to be highly porous: the nomadic and semi-nomadic population collectively insist on access to pastoral resources (Babiker, 2013). Numerous demonstrations are documented, sometimes violent, yet they are often suffocated. In Shendi, many people protested when a private company began to fence the land protected by the army. The company claimed to have informed the local institutions, but these – the local inhabitants say – had never involved the community regarding the allocation of land. At this point, the conflict was inevitable and became violent: in some cases, the Army demolished the settlements. In another case, not far away from Khartoum, people from the

communities that were displaced after the establishment of the agricultural project, occupied the company’s storehouse just after the first harvest and burned the entire product. The more active protestors are arrested while others are subjected to heavy fines. Many private companies have resorted to fences and guards to oversee the boundaries of the project and to reaffirm its exclusivity. The ultra-thin spaces appear to be, in practice, fragile due to their extreme “superficiality” (in the sense that they act only on the surface) and owing to their lack of positive interaction with the social and environmental context.

5. Comparing thin e ultra-thin spaces

The primary objective and purpose of large-scale irrigation projects is to increase agricultural production of cash-crops (that is, an agricultural crop which is grown to sell for profit, as opposed to a subsistence crop). The thick spaces, inherited from a long, gradual sedimentation of rights, uses and knowledge by local communities, are overwhelmed by the imposition of the modern territorial project, which then takes on the features of thin spaces. The large-scale state projects such as Gezira or Kenana require heavy territorial transformations: the construction of dams and pumping stations; the levelling and grading of the land in order to install irrigation and drainage canals; construction of rail and motorway networks for supplies and equipment for agricultural purposes, including transportation to markets; electrical networks and telephone lines to speed up communication for commercial and operational purposes. Along with the hydraulic and agricultural transformations, there is a need for the creation of new settlements equipped with schools, clinics and cultural centres. The local workforce is not enough, and more labour force is drawn from the outside, thus creating a demand for more social services. State modernization is promoted as an invaluable opportunity for the rural community (Mohamud and Verhoeven, 2016). Even though these large-scale projects eliminate the uniqueness of local traditions, they are tied to the available resources of the territory and engage the population not only in the production cycles but also to what is considered ‘modern’ development. At the moment of the establishment of the project, old villages are destroyed, and the local people are displaced. Individuals are moved away from their previous houses, yet soon are reinstated in new housings. Indeed, the project needs this labour force. Agricultural work is highly disciplined: the production cycle is based on the principle of ‘command and control’ (Gaitskell, 1959). Supervisors and technicians inspect the fields, determine work schedules, distribute water, seeds, fertilizers and pesticides. They also have the power to enforce punitive measures for absenteeism, less productive workers and troublemakers. But this form of control meets resistance by individuals, and, in some cases, collectively. Some workers transgress the rules of the projects through sabotage, theft of fertilizers and pesticides or by illegal cattle breeding. In the words of Scott (1988), these are ‘the weapons of the weak’. The drastic choice to concentrate on modern monoculture, excluding the traditional multiplicity of uses and imposing a centralized control of production, simplifies the space, reducing it to a few technical variables.

‘Ultra-thin spaces’, such as the fodder projects in the River Nile state, represent an example of an ulterior simplification of the approach to the drylands: limited infrastructural interventions; innovative technology; few technical personnel; little involvement with locals; and, most important, a short-term timeframe. The table below summarizes the main differences between ‘thin spaces’ and ‘ultra-thin spaces’ (Table 1).

To begin with, when selecting an area to invest in, investors favour areas that are close to transportation routes and pre-existing electrical and telecommunication networks, thus eliminating the need to invest in costly infrastructures. In the second place, by adopting innovative irrigation technology costly levelling of the terrain and preparation of the soil are avoided. Settlements are not in the plans, only those needed for a few technical personnel: in other words, the areas would not have any

Table 1

	<i>Thin spaces</i>	<i>Ultra-thin spaces</i>
Role of the state	Planner and manager	Bureaucratic and financial facilitator
Logic	Reinforcement of state sovereignty	Disassembling of national sovereignty
Methods	Challenging infrastructural projects	Light infrastructural interventions
Relation with space	Production anchored on space	Potential mobility of productive assets
Population	Initially displaced, but then included	Displaced
Timeframe	Long-term	Short-term (depending on profit margins)
Local workforce	Essential	Marginal
Conflicts	Internal disobedience	Opposition

villages or even corridors for passage of men and cattle. The presence of the local population is viewed as a possible source of conflict. Consequently, the transformation imposed is minimal, light. The investment is considered ‘mobile’ since it can be detached from the ground and transferred elsewhere when necessary. Investors are attracted to areas where the costs (such as water, land, electricity, the labour force...) and potential conflicts with the local community are minimal. To this end, the agricultural investment does not have to anchor itself to the land but simply creates temporary base on it.

The efficient mechanization of the production cycle drastically reduces the number of necessary workers. Just a few highly specialized technicians are needed to autonomously run the agricultural machinery: the work consists in monitoring the performance of the agricultural and hydraulic instruments and managing the transportation of the products. The technicians live in ‘gated communities’ located within the project site (Ferguson, 2005). Surveillance of the perimeters of the project is essential. Production can be threatened by unwanted outside intrusions such as by animals, members of the local community who were expelled from the project, and garbage transported by wind. Frequent cases of opposition arise from local communities who see their resources taken away with little or no compensation.

These ‘ultra-thin spaces’ have recently spread globally as one of the leading forms in which ‘land grabbing’ is occurring (Deininger, 2011; Li, 2011; Mehta et al., 2012; Wolford et al., 2013; Allan et al., 2013; Hall et al., 2015; Lavers and Boamah, 2016; Schoneveld, 2017). After the 2007–2008 crisis of agricultural prices and the economic downturn in 2008, private companies and investment funds of countries – whose water resources and suitability of soil for agriculture are scarce – accelerated the acquisition of land to cultivate abroad, with the ultimate objective of providing food security at home. In exchange, they offered modern investments in agriculture, transfer of technology, access to the international commodities market and job creation. Land concession – which runs counter to the interests of the local communities – is facilitated by the governments of hosting countries. In fact, by attracting capital from abroad, they are reinforcing their international visibility and the national elite.

The state presents itself as an expert and cataloguer of investment possibilities within its territory and displays them as a ‘showcase opportunity’. According to Dardot and Laval (2009), it is therefore inopportune to describe the new forms of state policy in terms of retreat or abdication. Paradoxically, if it is true that the state permits the expansion of capital – to the detriment of the full spatial expansion of sovereignty – through policies that sustain private investments. Yet, it is at the same time true that the state is still appropriating value from its territory, even if it is no longer interested in implementing its own productive activities. The state is not even interested in the fact that investors are using all of the acquired land for production. The most important objective of the state is to concede huge portions of land in order to demand an appropriate payment of rent.

6. Conclusion

This paper has argued that the state can derive value from its control over space and non-human nature in different ways. Considering

the assets ‘land and water’ in Sudan, we have reconstructed how the attitude of the state – from colonial to being independent – has changed regarding the exploitation of natural resources and the mobilization of capital. We maintain that this analytical proposal can be useful not only in the Sudanese case but, in a broader sense, to better understand a phenomenon constitutive of new global geopolitics.

The initial phase, during the colonial era, was characterized by the active involvement of the state in the production processes, through a well-controlled management of natural resources: foreign capital – organized by Sudan Plantation Syndicate – was at the service of the colonial project. The main crop was cotton to supply English textile factories. The territorial outcome was the creation of the Gezira, a mega-project exemplary of the ‘thin spaces’, as described by Scott (1998).

With independence, on one hand, the state assumed direct control over the management of the mega-project by creating the Sudan Gezira Board, on the other hand, it was concerned with expanding the hydro-agricultural model through the Managil extension and other new projects, such as the Rahad scheme. Ministerial bureaucracies and a rigid top-down control system prevailed.

In the 1970s, at the time of the breadbasket strategy, a partnership with external actors was strengthened, in particular with government funds from the Gulf countries. The most significant example is the Kenana Sugar Company, which produces sugar both for the domestic market and, the most refined part, for the foreign one. If the territorial outcome is always within the category of ‘thin spaces’, the organizational model is rather that of a multinational company, with a mixed public-private partnership.

Finally, in the last phase, which is characterized by the transition from a developmental to a rentier state, a new way appears to capture value from space and non-human nature: to facilitate the entry of foreign entrepreneurs, the state accepts and indeed actively proposes the allocation of spaces, until then common lands, to external actors, effectively accepting to delegate parts of its sovereignty. In this way, the state can extract rents from the attribution of property and exploitation rights to others. The crop that is the symbol of this phase is fodder for dairy industries in the Gulf countries. The territorial outcome is the creation of ‘ultra-thin spaces’, clearly enclosed and fenced off from surrounding areas and very different from the ‘thin spaces’ before created by the state, as planner of economic and territorial development.

The role assumed by the state in these different phases obviously changes: in the first period, it is a first-person producer of surplus value, nowadays, it merely collects an income. These different strategies are both forms of exercise of power that affect the organization of the territory.

Sudan is a good example for observing the shift of the state from one strategy to another, and its ability to change and adapt to new contexts. It should also be noted that these different articulations of land, water, state and capital can coexist within the same context. The basic pre-disposition of the state remains that of being the direct protagonist of the organization of the territory: if certain conditions still existed, it would return to play an active role in the productive processes of creating value from non-human nature. For example, interviews held in the federal ministries and in the mega-projects reveal a sense of nostalgia for the days when available funds allowed bureaucracies and

technicians to exercise full control over the territory and the use of water and land. Reluctantly, the state was forced to identify alternatives, lacking resources and conditions to continue to be the main protagonist.

However, it is important to notice that the Sudanese situation illustrates how the state is far from being a helpless victim of the global economy. We have seen that the Sudanese government continuously produces new favourable terms for foreign investments. This is in line with what various authors claim: ‘states [...] are not coerced into accessing foreign capital by selling off pieces of their national territory to more powerful economic or political players. Instead, many states are active, calculating partners in land deals, negotiating the costs and benefits of the contemporary moment in order to maximize returns on what are considered marginal lands or marginal communities’ (Wolford et al., 2013, p. 192). In the words of Sassen (2013, p. 44), ‘this is a very different way of representing economic globalization than the common notion of the whole state as a victim’. By promoting the proliferation of foreign enclaves inside the country, the ‘new stage of openness’ of the Sudanese economy is contributing to a ‘foreignisation of space’ (Zoomers, 2010): ‘large-scale land acquisitions contribute to produce a global operational space [within] national territories, [thus producing] a partial denationalization deep inside nation-states, a structural hole in the tissue of national sovereign territory’ (Sassen, 2013, p. 43). The state had indeed found a new way to insert itself in ‘value grabbing’ (Andreucci et al., 2017), which is taking place globally, by benefiting from the continual capacity of granting large portions of territory to foreign investors. It could be defined as a ‘rent from sovereignty’.

Conceding parts of national territory to foreign investors is by now a fundamental practice for pursuing financial revenues (by rent) that are necessary for the government’s survival, which is based on maintaining the Sudanese elite (Woertz, 2013, p. 161). The rent extraction from environmental resources is essentially a distributional relation (Andreucci et al., 2017, p. 35).

The mechanisms of redistribution of income have increased inequalities by favouring elites close to the government: the unsustainability of this revenue distribution strategy is certainly one of the fundamental motivations behind the recent revolts that led to the fall of al-Bashir in April 2019.

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References

Abdalla, M.N.M.O., 2014. The impact of Government Policies on Foreign Direct Investment in Developing Countries: the Case of Sudan. Doctoral thesis, Durham University, Durham, UK. < www.theses.dur.ac.uk/10861/ > (last access December 2018).

Ahmed, A., 2011. The impact of Southern Sudan Secession on the State in the North and the New Southern State. Paper presented at the Second Annual Conference of Faculty of Economic and Social Studies in Khartoum. Khartoum, University of Khartoum, Sudan.

Allan, J.A., Keulertz, M., Sojamo, S., Warner, J. (Eds.), 2013. Handbook of Land and Water Grabs in Africa, Foreign Direct Investment and Food and Water Security. Routledge, Abingdon.

Andreucci, D., García-Lamarca, M., Wedekind, J., Swyngedouw, E., 2017. “Value Grabbing”: a political ecology of rent. *Capital. Nat. Social.* 28 (3), 28–47. <https://doi.org/10.1080/10455752.2016.1278027>.

Awulachew, S.B., Smakhtin, V., Molden, D., Peden, D. (Eds.), 2012. The Nile River Basin. Water, Agriculture, Governance and Livelihoods. Routledge, Abingdon.

Babiker, M., 2013. Mobile pastoralism and land grabbing in Sudan. Impacts and responses. In: Catley, A., Lind, J., Scoones, I. (Eds.), Pastoralism and Development in Africa, Dynamic Change at the Margins. Routledge, Abingdon, pp. 177–185.

Barnett, T., 1977. The Gezira Scheme. An Illusion of Development. Frank Cass, London.

Beblawi, H., 1987. The rentier state in the arab world. *Arab Stud. Quart.* 9 (4), 383–398. doi:www.jstor.org/stable/41857943 (last access December 2018).

Bernal, V., 1997. Colonial moral economy and the discipline of development: the Gezira scheme and “Modern” Sudan. *Cult. Anthropol.* 12 (4), 447–479. <https://doi.org/10.1525/can.1997.12.4.447>.

Bertoncin, M., Biciatto, F., Bonollo, L., Croce, D., Faggi, P., Mariani, L., Minoia, P., Pase, A., 1995. Irrigazione, Stato e territorio in Sudan: il gioco della posta in gioco. *Terra d’Africa* 8–40.

Bertoncin, M., Pase, A., Quatrada, D., Turrini, S., 2017. Territori dello zucchero: le dinamiche di prossimità nella *Sugar Belt* sudanese. *Rivista Geografica Italiana* 124 (2), 93–114.

Biciatto, F., Faggi, P., 1995. Gezira scheme between state and market: some remarks on the privatization of irrigation in Sudan. *Geo J.* 37 (1), 101–104. <https://doi.org/10.1007/BF00814890>.

Bond, P., 2008. In: Mensah, J. (Eds.), Accumulation by Dispossession in Africa: False Diagnoses and Dangerous Prescriptions. Neoliberalism and Globalization in Africa: Contestations from the Embattled Continent. Palgrave, New York.

Brenner, N., Elden, S., 2009. Henry lefevre on state, space, territory. *Int. Political Sociol.* 3, 353–377. <https://doi.org/10.1111/j.1749-5687.2009.00081.x>.

Brown, W., 2010. Walled States, Waning Sovereignty. Zone Books, New York.

Bush, R., Bujra, J., Littlejohn, G., 2011. The accumulation of dispossession. *Rev. Afr. Polit. Econ.* 38 (128), 87–192. <https://doi.org/10.1080/03056244.2011.582752>.

Chambers, R., 1969. Settlement Schemes in Tropical Africa. Praeger, New York.

Chevillon-Guibert, R., Magrin, G., 2018. Rutées vers l’or au Soudan, au Tchad et au Sahel: logiques étatiques, mobilités et contrôle territorial. *BAPG – Géographies* 2, 272–289. <https://doi.org/10.4000/bagf.3272>.

CLJ, 2006. Soil and Oil: Dirty Business in Sudan. CLJ, Washington, DC. < www.paxvoortrede.nl/.../soilandoildirtybusinessinsudan.pdf > (last access December 2018).

Dardot, P., Laval, C., 2009. *La Nouvelle Raison du Monde. Essai sur la société néolibérale*, La Découverte, Paris.

Davis, D.K., 2016. *The Arid Lands: History, Power*. The MIT Press, Cambridge, Knowledge.

Deininger, K., 2011. Challenges posed by the new wave of farmland investment. *J. Peasant Stud.* 38 (2), 217–247. <https://doi.org/10.1080/03066150.2011.559007>.

Desai, G.D., El Tigani, M.E.M., 2007. The Sugar Industry in Sudan. In: Hopkins, P.G. (Ed.), *The Kenana Handbook of Sudan*. Kegan Paul, London, pp. 639–650.

El Nazir, O.A., Desai, G.D., 2001. Kenana, Kingdom of Green Gold. Grand Multinational Venture in the Desert of Sudan. Kegan Paul, London.

Elbeely, K.H., 2013. The economic impact of Southern Sudan secession. *Int. J. Bus. Soc. Res.* 3 (7), 78–83. < www.thejournalofbusiness.org/index.php/site/article/view/250/247 > (last access December 2018).

Eldaw, A.M., 2004. The Gezira Scheme: Perspectives for Sustainable Development. Reports and Working Papers, German Development Institute, Bonn. < www.files.ethz.ch/isn/27931/2004-02.pdf > (last access December 2018).

Elnur, I., 2009. *Contested Sudan, The political economy of war and reconstruction*. Routledge, Abingdon.

Ertsen, M.W., 2016. Improvising Planned Development on the Gezira Plain, Sudan 1900–1980. Palgrave MacMillan, Houndmills. <https://doi.org/10.1007/978-1-137-56818-2>.

Ferguson, J., 2005. Seeing like an oil company: space, security, and global capital in neoliberal Africa. *Am. Anthropol.* 107 (3), 377–382. <https://doi.org/10.1525/aa.2005.107.3.377>.

Gaitskell, A., 1959. *Gezira. A Story of Development in the Sudan*. Faber and Faber, London.

Goldstein, J.E., Yates, J.S., 2017. Introduction: Rendering land investible. *Geoforum* 82 (June), 209–211. <https://doi.org/10.1016/j.geoforum.2017.04.004>.

Hall, R., Edelman, M., Borrás Jr., S.M., Scoones, I., White, B., Wolford, W., 2015. Resistance, acquiescence or incorporation? An introduction to land grabbing and political reactions ‘from below’. *J. Peasant Stud.* 42 (3–4), 467–488. <https://doi.org/10.1080/03066150.2015.1036746>.

Harvey, D., 2003. *The New Imperialism*. Oxford University Press, Oxford.

Hassan, A., 2015. Overview of the Salient Elements of Sudan’s Investment Encouragement Act 2013. In: Paper presented at the Fourth Annual Conference on Structural Reform, Transformation, and Sustainable Development in Sudan: Economic, Political, and Social Perspectives, University of Khartoum, Khartoum.

Hibou, B., 1999. (Eds.) *La privatisation des États*. Karthala, Paris.

Holt, P.M., Daly, M.W., 1979. *The History of the Sudan. From the Coming of Islam to the Present Day*. Weidenfeld and Nicolson, London.

Ince, O.U., 2014. Primitive accumulation, new enclosures, and global land grabs: a theoretical intervention. *Rural Sociol.* 79 (1), 104–131. <https://doi.org/10.1111/ruso.12025>.

Kaikati, J.G., 1980. The economy of Sudan: a potential breadbasket for the Arab world? *Int. J. Middle East Stud.* 2, 99–123. <https://doi.org/10.1017/S002074380000283>.

- Keulertz, M., Woertz, E., 2015. States as actors in international agro-investments. *Int. Dev. Policy/Revue internationale de politique de développement* 6 (1), 30–52. <https://doi.org/10.4000/poldev.2023>.
- Lavers, T., Boamah, F., 2016. The impact of agricultural investments on state capacity: a comparative analysis of Ethiopia and Ghana. *Geoforum* 72 (June), 94–103. <https://doi.org/10.1016/j.geoforum.2016.02.004>.
- Lefebvre, H., 1991. *The production of space*. Blackwell, Oxford UK, Cambridge USA.
- Li, T.M., 2011. Centering labor in the land grab debate. *J. Peasant Stud.* 38 (2), 281–298. <https://doi.org/10.1080/03066150.2011.559009>.
- Li, T.M., 2017. Rendering land investible: five notes on time. *Geoforum* 82 (June), 276–278. <https://doi.org/10.1016/j.geoforum.2017.04.004>.
- Loftus, A., 2017. Political ecology I: Where is political ecology? *Prog. Hum. Geogr.* <https://doi.org/10.1177/2F0309132517734338>.
- Loftus, A., 2018. Political ecology II: Whiter the state? *Prog. Hum. Geogr.* <https://doi.org/10.1177/0309132518803421>.
- Magnaghi, A., 2000. *Il progetto locale*. Bollati Boringhieri, Torino.
- Magrin, G., 2013. *Voyage en Afrique rentière. Une lecture géographique des trajectoires du développement*. Publications de la Sorbonne, Paris.
- Mahgoub, F., 2014. Current status of agriculture and future challenges in Sudan. *Current African Issues*, 57, Nordiska Africainstitutet, Uppsala. [www. < http://nai.diva-portal.org/smash/get/diva2:712485/FULLTEXT01.pdf >](http://nai.diva-portal.org/smash/get/diva2:712485/FULLTEXT01.pdf) (last access December 2018).
- Mehta, L., Veldwisch, G.J., Franco, J., 2012. Introduction to the Special Issue: Water Grabbing? Focus on the (Re)appropriation of Finite Water Resources, *Water Alternat.* 5 (2), 193–207. [www. < www.water-alternatives.org/index.php/volume5/v5issue2/165-a5-2-1/file >](http://www.water-alternatives.org/index.php/volume5/v5issue2/165-a5-2-1/file) (last access December 2018).
- Mohamud, M., Verhoeven H., 2016. Re-engineering the state, awakening the nation: dams, islamist modernity and nationalist politics in Sudan. *Water Alternat.* 9 (2), 182–202. [www. < www.water-alternatives.org/index.php/alldoc/articles/312-a9-2-2/file >](http://www.water-alternatives.org/index.php/alldoc/articles/312-a9-2-2/file) (last access December 2018).
- Musso, G., 2016. *La caserma e la moschea, Militari e islamisti al potere in Sudan*. Carocci, Roma.
- National Investment Encouragement Act, 2013. [www. < www.sudanembassy.nl/images/pdf/The%20National%20Investment%20Encouragement%20Act.pdf >](http://www.sudanembassy.nl/images/pdf/The%20National%20Investment%20Encouragement%20Act.pdf) (last access December 2018).
- NIA, 2013a. *Investor's Guide*. [www. < www.sudanembassy.nl/images/pdf/Investors%20Guide%202013.pdf >](http://www.sudanembassy.nl/images/pdf/Investors%20Guide%202013.pdf) (last access December 2018).
- NIA, 2013b. *Procedures Manual*. [www. < www.sudanembassy.nl/images/pdf/Procedures%20Manual.pdf >](http://www.sudanembassy.nl/images/pdf/Procedures%20Manual.pdf) (last access December 2018).
- NIA, 2013c. *Directory of Proposed Investment Projects*. [www. < www.sudanembassy.nl/images/pdf/Projects%20Book%202013.pdf >](http://www.sudanembassy.nl/images/pdf/Projects%20Book%202013.pdf) (last access December 2018).
- O'Brien, J., 1981. Sudan, an Arab breadbasket? *Merip Rep.* 99, 20–26. <https://doi.org/10.2307/3011317>.
- Ong, A., 2006. Neoliberalism as Exception: Mutations in Citizenship and Sovereignty. <https://doi.org/10.1215/9780822387879>.
- Parenti, C., 2015. The environment making state: territory. *Nat. Value Antipode* 47 (4), 829–848. <https://doi.org/10.1111/anti.12134>.
- Plusquellec, H., 1990. *The Gezira Irrigation Scheme in Sudan; Objectives, Design, and Performance*, Technical Paper Number 120, The World Bank, Washington DC. [www. < www.documents.worldbank.org/curated/en/377141468778504847/The-Gezira-irrigation-scheme-in-Sudan-objectives-design-and-performance >](http://www.documents.worldbank.org/curated/en/377141468778504847/The-Gezira-irrigation-scheme-in-Sudan-objectives-design-and-performance) (last access December 2018).
- Pase, A., 2011. *Linee sulla terra. Confini politici e limiti fondiari in Africa subsahariana*. Carocci, Roma.
- Salman, S.M.A., 2010. *The World Bank and the Gezira Scheme in Sudan: Political Economy of Irrigation Reforms*, Report 69873, The World Bank, Washington, DC. [www. < www.documents.worldbank.org/curated/en/539061468304195366/Sudan-The-World-Bank-and-the-Gezira-scheme-in-the-Sudan-political-economy-of-irrigation-reforms >](http://www.documents.worldbank.org/curated/en/539061468304195366/Sudan-The-World-Bank-and-the-Gezira-scheme-in-the-Sudan-political-economy-of-irrigation-reforms) (last access December 2018).
- Sassen, S., 2013. Land grabs today: feeding the disassembling of national territory. *Globalizations* 10 (1), 25–46. <https://doi.org/10.1080/14747731.2013.760927>.
- Schoneveld, G.C., 2017. Host country governance and the African land rush: 7 reasons why large-scale farmland investments fail to contribute to sustainable development. *Geoforum* 83 (July), 119–132. <https://doi.org/10.1016/j.geoforum.2016.12.007>.
- Scott, J.C., 1988. *Weapons of the Weak, Everyday forms of peasant resistance*. Yale University Press, New Haven and London, pp. 1985.
- Scott, J.C., 1998. *Seeing Like a State. How Certain Schemes to Improve the Human Condition Have Failed*. Yale University Press, New Haven and London.
- Sidaway, James D., 2007. Spaces of postdevelopment. *Prog. Hum. Geogr.* 31 (3), 345–361. <https://doi.org/10.1177/0309132507077405>.
- Sudanow, 2017. *High Demand Prompts Rush For Sudan's Alfa Alfa*. [www. < www.sudanow-magazine.net/page.php?mainId=15&subId=22&Id=204 >](http://www.sudanow-magazine.net/page.php?mainId=15&subId=22&Id=204) (last access December 2018).
- Unctad, 2015. *Investment Policy Review. The Sudan*. United Nations, Geneva. [www. < www.unctad.org/en/PublicationsLibrary/diaepcb2014d5_en.pdf >](http://www.unctad.org/en/PublicationsLibrary/diaepcb2014d5_en.pdf) (last access December 2018).
- Verhoeven, H., 2015. *Water, Civilisation and Power in Sudan: the Political Economy of Military-Islamist State Building*. Cambridge University Press, New York. <https://doi.org/10.1017/CBO9781107447769>.
- Voyles, T.B., 2015. *Westland: Legacies of Uranium Mining in Navajo Country*. University of Minnesota Press, Minneapolis.
- Wai, D., 1979. Revolution, rhetoric, and reality in the Sudan. *J. Modern Afr. Stud.* 17 (1), 71–93. <https://doi.org/10.1017/S0022278X00005188>.
- Wallach, B., 1988. Irrigation in Sudan since independence. *Geogr. Rev.* 78, 417–434. <https://doi.org/10.2307/215092>.
- White, B., Borras Jr, S.M., Hall, R., Scoones, I., Wolford, W., 2012. The new enclosures: critical perspectives on corporate land deals. *J. Peasant Stud.* 39 (34), 619–647. <https://doi.org/10.1080/03066150.2012.691879>.
- Woertz, E., 2013. *Oil for Food, the Global Food Crisis + The Middle East*. Oxford University Press, Oxford.
- Wolford, W., Borras Jr, S.M., Hall, R., Scoones, I., White, B., 2013. Governing global land deals: the role of the State in the rush of land. *Develop. Change* 44 (2), 189–210. <https://doi.org/10.1111/dech.12017>.
- Worldfolio, 2014. *Agriculture is a sector that symbolizes Sudan's great potential*. [http://www.theworldfolio.com/interviews/mohamed-elmardi-eltigani-managing-director-kenana-sugar-company-sudan-n2804/2804/ >](http://www.theworldfolio.com/interviews/mohamed-elmardi-eltigani-managing-director-kenana-sugar-company-sudan-n2804/2804/) (last access December 2018).
- Yousif, G.M., 1997. *The Gezira Scheme. The greatest on Earth under one management*. Africa University House, Khartoum.
- Zoomers, A., 2010. Globalisation and the foreignization of space: seven processes driving the current global land grab. *J. Peasant Stud.* 37 (2), 429–447. <https://doi.org/10.1080/03066151003595325>.