

Sahara

Is the Sahara Berlin?

The Sahara is the archetypal landscape of vast emptiness, culturally coded as separate from “civilization’s” urban settlements and indeed industrial capitalism. However, the Saharan territory contains the world’s largest reserves of phosphate rock, a principal component of agricultural fertilizer and thus the global food production system. Through the extraction, commercialization, and distribution of phosphates, the Sahara has become intimately tied into the Global metropolitan network GMN (Brenner, 2016) and capitalist growth & reproduction. This ‘extreme territory’ can be viewed as just one node in a linear supply chain: from mines in the desert to European fertilizer factories in to industrialized farms to the local Tesco. Indeed, the nexus between the Sahara – specifically Morocco’s state monopoly Office Cherifien des Phosphates (OCP) – and contemporary European economic hegemony – metonymically “Berlin” – is the most articulated of the Sahara’s global connections.

That said, The Sahara is not *simply* the start of this supply chain or a (neo)colonial subject of Europe. Rather, it is part of a more complex set of (neoliberal) interrelations, which configure flows of capital, labor, & commodities and restructure national and supranational regulatory regimes, all toward the accumulation of capital and (at times) geopolitical advantage. In recent decades, and especially since the commodities boom of 2007-2008, new state-market formations have emerged in the Saharan phosphate production system, leading to new rounds of infrastructural investment and vertical integration which capitalize on the Sahara’s comparatively weak labor standards.

Meanwhile, Saharan phosphate concerns (principally the OCP), either alone or through joint Saharan-European ventures, have begun securing a presence in fertilizer markets across the globe. This provides the Sahara a part in the current market, of course, but it also strategically points to a smooth (and profitable) transition to Saharan phosphate as countries’ local reserves dwindle in the coming century. The Saharan phosphate production system is hence nearing an inflection point. From here we begin to see the contours of new rounds of Saharan land enclosure and (natural and human) resource extraction that will mark the new era of global phosphate scarcity, which is spatially evidenced through a particular urbanization pattern. To analyze and criticize *how* Phosphate industry urbanizes the Sahara, to project an alternative turn, is the objective of this study.

History of Saharan Phosphate

Urbanization and Phosphate Mining's Capitalist Prehistory

Phosphorus, as a crucial element for the survival of living things, is found naturally in dead plant and animal matter, as well as animal manure and human excreta. Pre-industrial agricultural practices heavily relied on the spreading of manure and excreta (called "night soil" in Japan) to renew soil stripped of its phosphate content through farming. (Ashley, et al., 2011). These phosphate sources were not themselves commoditized, and their circulation was necessarily local – from the bucket in the corner to the fields. This was augmented, in certain cases, by anthropogenic fire and crushed bones.

Ashley, et al. (2011) point to two related socio-spatial revolutions which upended the pre-industrial phosphate recycling system: the Industrial and Sanitation revolutions. The rise of industrial capitalism in the Global North (particularly northern Europe and the northeast United States) began to draw population from the historic hinterlands and into rapidly growing urban agglomerations, taking with them their phosphorous-rich excreta. This newly urbanized excreta collected in cesspools & courts and caused successive epidemics. Public health and public works officials eventually treated the problem of urbanized excreta through indoor plumbing, sewers, and water treatment. Ashley, et al. (2011) assert that between mass migration into population-dense areas and new technologies of waste disposal, 'civilization' was transformed "from a phosphorus recycling society to a phosphorus throughput society" (p. 740).

Back in the fields, the ground was starved for phosphorus. Trade in bone meal ticked up, but was soon replaced by guano (hardened bird & bat droppings). Guano was mined mostly from islands in the Global South through colonial holdings and postcolonial arrangements. (Leonard, 2008, citing Matthew, 1970). These guano arrangements introduced phosphates into the increasingly planetary capitalist marketplace. Phosphates were now an important primary commodity, fueling world food production, which fed an urbanizing population divorced from traditional metabolic arrangements. Phosphate fertilizers played a dual role: refreshing depleted soil and providing a low-labor-intensity, intra-year boost to crop yields. (Heckenmüller, et al., 2014). Guano, ultimately, couldn't satisfy the emerging industrial agriculture system's need for mineral inputs – at least not economically.

Colonialism and Phosphate Rock in North Africa

Mining of phosphate rock began commercially in 1847 in England, during the booming guano trade (van Kauwenbergh, et al., 2010). However, Phosphate extraction wasn't subject to mechanized industrialization for several decades (ibid.), contemporaneous with discoveries of phosphate deposits in peri-littoral sections of the Sahara in Europe's North African colonies.

Phosphate rock was discovered in Algeria and Tunisia in 1873, during French colonization. (Schreiber and Matlock, 1978). Commercial mining began in both countries in the 1890s (ibid.). A few years later, British concerns discovered phosphate deposits in Egypt, and commercialization began in 1907-1910 (Elmaadawy, et al., 2015). Initially Egyptian production was limited to the Nile Valley and Red Sea coastal regions, with large deposits discovered deep in Egypt's Western Desert during the mid-20th Century.

Market-shaking deposits were discovered in Morocco in the early 20th Century, prompting in 1920 the founding of the Office de Chérifien des Phosphates (OCP), a French colonial monopoly on Moroccan phosphate mining (Camprubí, 2015; Schreiber and Matlock, 1978). The OCP came under the authority (and shared technical information with) of a French government agency which coordinated phosphate production through its African colonies, the Comptoir de Phosphates de l'Afrique du Nord (Camprubí, 2015; Célerier, 1935). According to Camprubí (2015), the Comptoir was "created to put the commercialization of raw phosphate at the service of the metropolis" (p. 687).

First wave of investment

While undergrounding phosphate mines and exploratory work throughout North Africa's "Tethyan" deposits had been around since the 1920s, investment in extraction infrastructures didn't accelerate until the post-war period (Williams and Zellers, 1987). Two distinct waves of phosphate infrastructure investment are palpable in Saharan phosphate's history. The first of these occurred in the 1970s, and is outlined anecdotally below through the story of Bu Craa. Bu Craa isn't the only example, of course. Around this time, Morocco began ramping up investment into the Khourigba mines and related enterprises (Williams and Zellers, 1987). Bu Craa offers a paradigmatic example, however.

South of Morocco, Spain held Western Sahara (then called the Spanish Sahara). A young geologist discovered phosphate there on a colonial prospecting mission, and thereafter Franco ordered a plan for phosphate extraction in 1947. After many fits and starts, in 1963, Spanish scientists drilled a hole at Bu Craa, a site over 100km into the desert, apparently marked by a single tree (Camprubí, 2015). Here they discovered extensive phosphate reserves, the top layer of which was ripe for extraction (Hagen, 2015).

By the time of Bu Craa's discovery, Morocco had become independent, and the OCP was now an organ of the Moroccan state. (The Comptoir was dissolved, but reorganized as a French-controlled corporation, the Union Phosphatiers Africaine.) International pressure mounted on Spain to decolonize the Spanish Sahara. The Sahara gave the Spanish access to phosphate reserves at a key time, though. Due to the expansion of industrial agriculture,

In 1971 the Spanish colonial administration's Saharan phosphate monopoly, Fosbucraa, opened a 100 km-long conveyor belt stretching from Bu Craa to El-Aaiun. By 1974, 14

kilometers of the conveyor belt burned at the hands of a then one-year-old Sahrawi independence group, the Polisario Front. (Strategic Studies Institute, 2013). It took only 7 militants and some local workers to destroy the belt and thus mining operations for roughly a year (ibid.).

A Sahrawi independence referendum was to come in 1975, but before it could occur, Spain struck a deal with Morocco. Spain would withdraw from Western Sahara, sell 65% of Fosbucraa to OCP, and delegate its then questioned authority to Morocco and Mauritania. In return Fosbucraa wouldn't be subject to complete nationalization, and Spain would receive a raw shipment of phosphorus annually.

Fighting between the Moroccan Royal Army and the Polisario Front stalled phosphate production throughout much of the late 1970s and early 1980s (Camprubí, 2015). At times, Morocco retreated from much of its territory, defending only the mine, the conveyor belt, and El-Aaiun, the port city – what it called the “useful Sahara” (Kamm, 1984). Eventually Morocco finished building a sand and stone berm, which stretches the entire length of the country, dividing it in two, and blocking the Sahrawi fighters from attacking Bu Craa and its related infrastructures.

Bu Craa, OCP, and the Western Saharan conflict hold a special position in the historiography of phosphate mining in the Sahara. They are privileged, in part, simply by the size of the phosphate reserves controlled by Morocco. Prices in global phosphate market are demand-driven, so OCP will likely never be a price setter. Nonetheless, they hold the majority of the world's phosphate (if present estimates are to be trusted). Bu Craa and OCP's significance extends beyond sheer size, though.

Bu Craa is the site of struggle between colonial, metropolitan powers battling for sovereignty, between multinational corporations vying for market dominance, and between armed collectives asserting material control over critical infrastructures. Through such struggle, this case exposes the urbanization of the Sahara through phosphate mining, which pervades the mining infrastructures throughout the region, albeit less dramatically.

Analysis: *Theorizing Saharan Phosphate*

One approach to understanding the Sahara as part of the Global Metropolitan Network could be to elucidate the “give-and-take.” In a sort of neo-colonial formulation, it’s clear the Sahara “gives” its natural resources to the world, while “taking” capital, machinery, etc. from the more ‘developed’ countries of the Global North. This approach does fundamentally unravel the notion of Sahara as an empty, homogenous territory outside the realm of world capitalism. This give-and-take structure could likely even be extended to interrogate the more transgressive and self-deterministic ways subaltern Saharan populations act within and against neo-colonial structures.

However, such an approach seems unsatisfactory, given the many connections discussed above. Capital instruments flow back and forth between firms of the GMN and firms of the Sahara. Spatial organizations of labor and infrastructure are beginning to converge in the GMN and the Sahara (e.g. Jorf and Pascagoula) as material and capital flows weave them together. Given these more nuanced connections, we might offer that instead of a “give-and-take” relationship, the Sahara and its ostensible outside are increasingly related through *mutual contingency*. Neither inside nor outside can function within global capitalism without the other – not because of a simple input-output chain, but through layers of transactions that leave each side vulnerable to forces of creative destruction.

This notion of mutual contingency comes with qualifications:

- Spaces and flows are not undifferentiated. Mali will never be equivalent to Alberta; Tunis never the same as Port Arthur; Moroccan loans cannot match the heft of Goldman Sachs. But spaces and flows also aren’t dictated by simple unidirectional hierarchies, as spatial arrangements are variously drawn into service to other territories at particular moments.
- That is, input-output chains do exist, but they don’t correspond to the putatively urban & non-urban, nor to developed & developing, nor are these chains permanent. Input-output chains can furthermore exist simultaneously between two spaces while running in reverse.
- Contingency means that spaces aren’t vulnerable to losing a position in global capitalism, but rather to losing their particular present position in global capitalism.
- Mutual contingency can be understood through different scalar manifestation.

Critique as [brief] for *alter-urbanization*

Phosphate production in the Sahara is part of a global phosphate production system, which itself feeds into, by and large, a global system of industrial agriculture and back into the global metropolitan network. Each of these moments (Saharan phosphatase production, global phosphate production, and global agriculture) are deeply problematic in numerous ways. Our critique will not take on all of the problems directly. Indeed this would neither be tractable nor appropriate. Rather, we hope to address the core drivers of the most pressing problems, to be identified below.

First, though, we must note which factors will not be addressed. On at least three important fronts, we will not address the core issue per se. Instead, we hope either to address the issue indirectly or to reframe the problem itself.

1. Phosphate production is a heavily polluting enterprise. Its mining, transport, beneficiation, acidification, transformation into fertilizer, and application in agriculture all have extreme environmental externalities. These range from the dramatic new multi-storey landforms produced from the mining itself to vast algae plumes and dead zones created by fertilizer run-off. The environmental wastelands resulting from phosphate production are not to be dismissed. That said, environmental hazard is a symptom of a problematic system, rather than the root of the problem. For this reason, we will not address the environmental impact of the phosphate production system directly, but hope that our proposal will alter the system which produces that pollution.

2. Next, we do not take aim at the globalization of phosphate exchange, broadly conceived. The present system of global trade preys on the economically and geopolitically weak, while promoting wasteful and laughingly redundant global commodity flows. That said, the world is facing an eventual scarcity of phosphate outside the Sahara, and conversely there are many resources the Sahara does not have on its own. Exchange in some form will likely prove desirable, and the fact of exchange is not *prima facie* problematic, no matter the inequities of exchange's present manner. The task is, then, to alter the mode of exchange.

3. Lastly, we will not directly address phosphate as an input into the global industrial agriculture system. We find this system wrong, environmentally deleterious, destructive of place-based and indigenous cultures, damaging to the public health, and in need of bold reconfigurations. Nevertheless, it is not the object of our critique. Though agricultural fertilizer is the main driver of phosphate rock extraction and commercialization, it is not phosphate's only use. We can't rely on a solution to the agricultural system to fully and forever address the problems of the phosphate system.

By removing from consideration these worthy if not central points, we also hope to avoid inherently nice but ultimately unsatisfactory solutions. These include engineering solutions which promote technological messianism, as well as disavowals of globalization which promote a vulgar localism. Terrific work is being done on technologies which collect phosphate from polluted waters and isolate it for reuse. Whether such a technology proves ecologically sufficient is hard to know. In theory, though, such a solution could solve pollution

and the inequities of world trade. Again, this is nothing to dismiss, but is still unsatisfactory – a mollification of (rather than solution to) the problems of the phosphate production system. Fundamentalist localism, meanwhile, is merely a privileged position which is unlikely to be maintained equitably and at scale.

With these qualifications out of the way, we now turn to state that the *critique* is constituent for the project of *alter-urbanization*. In other words, we approach *alter-urbanization* as the strategy to disrupt the criticizable conditions. Therefore, we frame the critique as the brief of a likely to happen alternative.

Critique > alter-

Regional Dimension

As it stands, extraction is already working to reorganize and re-territorialize the Saharan landscape. The genealogy of the present process has its roots in colonialism, and was put dramatically on display during the 1970s-80s with the building of the berm through Western Sahara, in order to secure phosphate rights. Today's process isn't quite so neatly (neo)colonial, however, and is more representative of the complex state-market formation which drives the phosphate market. Phosphate extraction is, of course, driven by a simple economic logic – get the extracted rock to market as cheaply as possible. Usually this means moving rock or beneficiated rock as quickly and as directly to port as possible.

Given this process, what do recent exploratory efforts mean for phosphate extraction as an industry tied to the given nation state? Canadian miners are working (or were working, before recent civil unrest) to undertake new phosphate mining in Mali. Bringing Malian phosphate to port poses unique political economic challenges, though. Not only is Mali landlocked – meaning a multi-national agreement would be necessary for any phosphate transportation infrastructures – but the most economic route (at least that defined through crude euclidean land allocation) would involve several states. Phosphate cannot be a purely national concern valorized through national-developmental strategies which marked the mid-20th Century. The present political economy instead valorizes extractive materials through the extrastate structures, which act in concert with and often through the relevant state(s), creating multiscalar frameworks for extraction which meet the economic demands of an admittedly competitive marketplace. In this way, phosphate deposits' location vis-a-vis ports, the related infrastructures which move phosphates between the two locales, and the extant territorial structure engenders new territorializations based on phosphate extraction. Is phosphate a region? In this way, yes.

Phosphate's regionalism and its tension with the national state poses two distinct but related problems. (1) Too many resources are plunged into the expulsion of phosphate from Saharan territory. In order to maintain the inflows of capital gained through phosphate extraction, phosphate must be delivered to the world market as profitably as possible. Usually this means exporting raw or beneficiated rock, and in certain cases phosphoric acid. In cases where phosphate is processed, workers face unfair pay and neighbors face unsafe environmental conditions. (2) Phosphate, not owing itself to state bounds, can be competitively exported from within multiple states. This creates an incentive for any state to valorize phosphate resources by any means necessary.

Though this prospect rarely comes up the same might be said for any individual locale which is rich in phosphate looking to develop itself within the national economy. If national subsumation to the world market (through financial links and the pressures of competition) renders the state impotent in regulating phosphate extraction in a moral way, how then to organize territory to such an end? Why not take seriously the idea of phosphate as a region, and begin to organize territorial power, and (importantly) rights, instead of just economic extraction, around that resource's geography. What would a phosphate-based region look like, and how would it interact with the process at hand.

This can be broken down into three related parts. First, create a hard regulatory border at the edge of the continent. This is a conceptually simple move that essentially says the Sahara won't export resources at its own expense. A large proportion of phosphate will stay within the borders of the African continent or else be industrialized there. Such industrialization would have to provide for workers' and community rights, or else it is simply an elaboration on the present trend of moving manufacturing processes to the Global South where such rights are underdeveloped. However, the second move could help such a project.

Instead of leaving nation-states to subsume themselves to neoliberal state-market formations – a sort of abjection that leaves the state in a zombie fugue – territory would be organized around the location of realized and potential phosphate resources, including phosphate deposits, deposits of geologic potential, and transportation & industrialization infrastructures. Reimagining African quasi-statehood is to assert a new geography solidarity, the decision by people who engage in the world market not to use artificial state or more naturalized ethnic boundaries as a shared road to subordination.

Critique > alter-

Local Dimension

The Neoliberal project in Morocco.

We frame the local dimension of our critique, within the process of neoliberal structural adjustments imposed to Morocco since the 1980s by the World Bank and the International Monetary Fund (Davis, 2006). In particular, we mobilize the concept of *Accumulation by dispossession* (Harvey, 2003) to look at *how* is it spatially manifested in the immediate territories of Phosphate Rock extraction, transportation and industrialization.

The procedure to develop the *critique* has been on the one hand, to identify as paradigmatic case study the area in between Khouribga mines and Jorf Lasfar port. And on the other hand, to address the following issues:

1. Impact of Phosphate industry on natural resources through energy production
2. Impact of Phosphate industry on territory through Infrastructure construction
3. Impact of Phosphate industry on local population

The initial approach to these topics evidences. First, Phosphate industry is currently intensifying its process of urbanization. And second, the intensification of the process demands natural resources for energy production, and land for infrastructure construction, which necessarily alter the circumstances of the local population. The details are explained as follows.

According to OCP sources (2014), Phosphate Rock mining is mainly powered by hydroelectric energy. The process to beneficiate the raw material requires is high energy demanding. To supply the growing demand of Phosphate production, a new dam was built and put into service in Aït Messaoud in 2013. The prey is located 75 km distance from the Khouribga mines in the Moroccan hinterland. Electricity is produced using as water source the *Oum Errabiâ* – second largest river or Morocco – and disrupting the basin flows and its agriculture.

After the dam was put into service, in 2014, the King of Morocco inaugurated a Phosphate Industrial Complex in Jorf Lasfar. The construction of this concentration of factories and services is part of the OCP strategy for vertical integration – previously referred – towards the major production of Phosphate derivatives, particularly fertilizers in the country.

It is relevant to highlight that this new pole of industrial activities is 200 kilometers distant from the places of Phosphate Rock extraction and beneficiation in Khouribga. Historically, Phosphate exploitation in Morocco has aimed railroads or conveyor belts to move the staple

from the hinterland to port. However, since 2014 a 198 kilometer slurry pipeline started to operate – reducing a 90% of costs (OCP, 2015) and cross-cutting the regional territory. The most evident outcomes of the new infrastructure are that its technology demands great amounts of water to operate – this builds up on the high hydro electrical demands of the industry. And besides, it contributes to impact local people's life through these processes:

1. Moroccan hinterland is characterized by a communal form of land ownership – so called *Terres Collectives* – ruled by the local tribes. Since 1914, a law allows the Moroccan central government to enclose those territories to serve national strategy interests. According to the Moroccan Ministry of domestic affairs, around 14.000ha were enclosed between 2005-2013 to support the Phosphate industry. Indeed, there is evidence of protests in Khouribga in 2011, where *terres collectives* owners claimed against the OCP enclosure. (Berriane, 2015), (Mahdi, 2014)
2. International and governmental investment on Phosphate Industry is mainly placed in the economy of fertilizer production close to ports – i.e Jorf Lasfar. This process contributes to domestic migration from the hinterland, due to the jobs opportunities on the Phosphate derivatives factories. Throughout our research, we may argue that this trend is problematic for two reasons. First, it contributes to the impoverishment of the inner zones of Morocco. And second, there is not a provision for places of health care, education or leisure to accommodate the migrants' needs and demands in the portuary areas.
3. The former two points on dispossession and migration lead to formulate the question of *how* population reacts to these processes. A simplify answer to the question might be looking at *what* prevents popular contestation. The answer given to us by a local journalist refutes to be quoted is the that commodity subsidies are the governmental tool of control. Looking at the World Bank Sources (2015), since World War II essential commodities are subsidized in Morocco. Despite international neoliberal pressures to avoid this policy, the Moroccan Monarchy has systematically refused to change it. As matter of fact, the most serious attempt to supprime the subsidies ended up with the popular revolt in 1981.

On the following, we propose to explore *how* the impact of urbanization in the local population might be altered. We believe that there is not a fully and consistent answer to the project, but only that a sum of geographical but also regulatory processes and events might drive a gear change of the ongoing dynamics.

1: To **alter- land enclosure**

To modify the effects of land enclosure, we believe that it is critical to provide formal visibility to the process. Therefore, we suggest the creation of a *pipeline* district as an institutional tool to cluster the enclosed lands' owners. Once map and evidence the magnitude of the expropriation policies, this organism will be responsible to manage the outcomes of the following:

- a) To force the Phosphate Industry to pay back the land value that has been enclosed
- b) To create a Right of Easement tax as an overtime contribute to the *Pipeline* district financing.

We refer to this strategy as **mediated transference of Phosphate revenues**. We understand that incomes from land value and Easement Tax should be channelized by regional structures to foster strategic plans of redistribution, rather than a direct transference of revenues to population. We believe that the management of this mechanisms is critical to the entire project of *alter- urbanization*.

2: To **alter- food control**

Aiming the revenues of the former process, we claim for the development of an alternative economy, tendentially less dependent on Phosphate Production to anticipate the resource scarcity. This strategy is based on fostering industrial agriculture and food production and requires the following steps.

- a) To redesign water management of the existing dams. As already mentioned, the construction of new dams to power Phosphate industry has placed the mining interests over agriculture in *Oum Errabiâ* basin. We propose that the river should balance both stakes and to come up with a mining recycling water system to irrigate the fields.
- b) To intensify land use for industrial agriculture. We have mapped areas that are might to be the scope of the agrarian transformation in both the near coastal areas but also in the hinterland. The strategy is only possible through further research on the nature of the fields and the preferred forms of cultivation. A partnership with the fertilizer industry to support the project might be mutually relevant.

- c) To enhance industrialization of food production. On an initial phase, this step is dependent on technology, know how and industrial goods imports. However, once established the goal is that local population may learn and develop their own aims to rule the industry.

We believe that food autonomy throughout agriculture industrialization might be a tool use by local population to claim rights and democracy.

3: To ***alter***: hinterland migration

The third strategy serves to *connect* implicitly and explicitly the former two. We propose to mobilize the Phosphate revenues to provide a better network in the *district line* to support the establishment of industrial agriculture, which ultimate change hinterland depopulation and impoverishment condition by means of the following operations:

- a) To create of a corridor along the slurry pipeline path.
- b) To reinforce existing roads that are cross-cutted by the pipeline.
- c) To design a plan to allocate to allocated places for population rights to housing, care, education, and leisure.

Notes:

Our *alter-urbanization* project can only be read as the sum of scales of intervention and the overlay of steps, which cannot be designed at once because they require geographical adjustments and temporal modulations. Albeit, the local scale is revealed as a comfortable zone to approach – based on our architecture / planning background –, we see it as a node in a chain of alternative strategies that need to be proposed. If as our study points, there are similar urbanization processes occurring and to come in the Saharan region, it seems pertinent to look at replicability of the *alter-urbanization* project. To articulate the mutability of the strategy, we propose the creation of a supra-national entity that operates beyond the country-scale. Our claim is that if the interest behind Phosphate industry urbanization in the Sahara have few boundaries, only a symmetrical structure can oppose the phenomena and structure the alternatives.

We understand that there should be an Urban project to democratically serve the interests of the peoples of the world – aware of its contradictions –, to alter the instrumentalization of the territory by the global finances. So, we conclude asking: ***Can alter-Urbanization be, global and democratic?***

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