

MINING THE DESERT

MIKE HANNIS and SIAN SULLIVAN find extractive routes from the colonial era still active in southern Africa.

At the extreme southern tip of Africa in 1652, the world's first trans-national corporation began establishing a new port. The powerful Dutch East India Company (VOC) initially just wanted a resupply point for ships rounding the Cape on their long and extremely profitable 'spice trading' route to Indonesia. But despite significant resistance from local people, over the following decades the Cape Colony spread ever further east and north, with a growing hunger for land and resources. Venturing into the interior, the newcomers found riches whose exploitation and export grew steadily under successive colonial regimes, intensifying with each new technological innovation in processing or transport.



Nama people bring green copper-bearing rocks to the Cape, 1681

In 1685, after seeing green copper-bearing rocks brought to the Cape by Nama people, the VOC dispatched an expedition to investigate the commercial viability of mining copper 400 miles to the north, near the Orange River which now forms the border between South Africa and Namibia. Led by Simon van der Stel and comprising around 60 people, numerous carts and wagons and over 300 oxen, horses and other livestock (for food as well as for draught power), this expedition had to find a considerable amount of water every day, in unmapped arid terrain.

Journeys like this would have been impossible without local 'Hottentot' (Nama) guides. These guides shared their precious knowledge of tiny springs in the vast dry landscape with the colonisers who would later displace them from their ancestral lands, as the colonial frontier advanced. Such displacements were in turn to have major impacts on many other groups still further north, deep into Namibia.

On a recent visit researching these historical impacts, we found the routes of early travellers peppered with mining sites.¹

Ilmenite - Whiter than White

Travelling north up the coast from Cape Town, the first major mineral extraction activity is of ilmenite, which is mined from coastal sands around Brandsebaai, north of the Olifants river mouth. The river was so named by the VOC's Jan Danckaert, who saw a herd of up to 300 elephants on its banks in 1660, near present day Citrusdal – there are none there now.

Ilmenite is mined primarily as a source of titanium dioxide, a brilliant white pigment widely used in products from paint,

paper, and plastics to food, toothpaste, and sunscreen. Large areas of sandy coastal habitat are excavated to access underlying heavy mineral sands, which are processed by acid leaching before being transported south for smelting and export. Every stage in this process uses vast amounts of water and power.

These open-pit mines are operated by Tronox, an American company, and an Australian firm called MRC, whose controversial operations on the west coast and elsewhere in South Africa have generated determined resistance from both environmentalists and local people.²

The ilmenite travels south on the final section of a freight-only rail line built in 1976 to carry iron ore. This line is well-known amongst rail enthusiasts for carrying some of the longest and heaviest trains in the world. Every nine hours, a train leaves the 14km-long pit at the remote Sishen iron ore mine in the Northern Cape, and travels the 861km to the deepwater export port at Saldanha, near Cape Town. Each train is four kilometres long, with six locomotives pulling over three hundred 100-tonne wagons full of iron ore.

Diamonds - Not Forever After All

Not far beyond Brandsebaai, the increasingly arid coastline starts showing signs of excavations and spoil heaps whose scale and extent dwarf the ilmenite mines. The next 500 miles of this legendarily inhospitable desert coast have been massively reshaped by over a century of diamond mining, first on the Namibian side of the Orange River and later on the South African side too.

In Namibia before the first world war, German colonial entrepreneurs around Lüderitz were producing a fifth of the world's diamonds, making a significant contribution to the Kaiser's war chest. Production was consolidated in the 1920s into one South African company. In the 1990s the newly independent Namibian state gained a stake through a joint venture between the government and de Beers. Diamonds remain the country's primary source of export revenue.

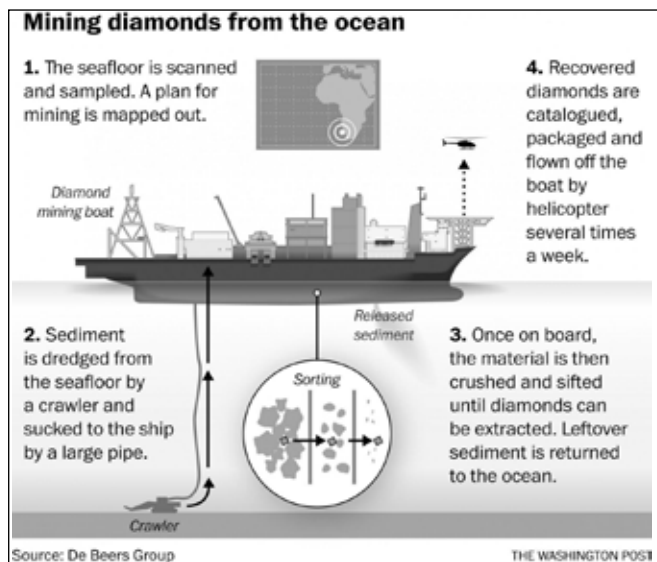
The border area around the Orange eventually became the epicentre of the industry, once it was realised that the diamonds had been washed down the river from far inland in the distant geological past.



Anonymous 1866 photograph of a mule-drawn train carrying copper, on the Namaqualand railway between Okiep and Port Nolloth.

At Oranjemund, just north of the Orange, decades of digging have pushed the Atlantic Ocean back hundreds of metres behind giant walls of sand and concrete, allowing the shoreline to be excavated down to the bedrock where diamondiferous gravels are found.

These land operations are now winding down as the focus shifts to marine mining. Most Namibian diamonds are now mined from the seabed off the southern coast. Further north, similar suction dredging technology will soon be employed on a larger scale to mine phosphate for use as fertiliser.



Okiep, near Springbok, became known as ‘the richest copper mine in the world’. Cornish mining engineers built pits and smelting works, overseeing a largely indigenous workforce, and production was soon booming. But getting the copper out of this remote area was a major challenge. Ox wagons, the main mode of heavy transport in Southern Africa at the time, couldn’t cope with the mountain passes. An attempt to build a road with convict labour to the coast at Hondeklip Bay was eventually abandoned, in favour of a 91-mile narrow gauge railway out of the mountains and across the sands to a new harbour at Port Nolloth. But steam locomotives couldn’t cope with the gradients, or the sand, and also needed more water than was easily available. So for over 20 years, the copper trains from Okiep to Port Nolloth were famously pulled by mules.³

For most of the 20th century, copper was instead hauled by road to a railhead further south at Bitterfontein, where it was loaded onto trains to Cape Town for export. The last pits in the area have only recently closed, but not because the copper was exhausted. As of 2017, this is essentially a devastated landscape of spoil heaps, closed mines, and unemployed communities. Nonetheless smaller companies are still re-mining the old spoil heaps using more efficient modern processes, and there are plans afoot for a US-style ‘superpit’ near Concordia.

In areas like this, mining companies come and go over long periods of time as conditions change. These conditions include not only market prices, but also prospecting and extraction technologies, and local factors such as labour costs, tax incentives, environmental regulations and the general compliance (or otherwise) of governments.

Copper - Rocks of Finest Green

Back in the seventeenth century, Van der Stel did find copper, near the present-day town of Springbok in the Northern Cape. His exploratory diggings, still visible today, burrow into a rocky outcrop that is indeed remarkably green. But the ore he found was not of high enough quality for the economics of the day to support the establishment of a mining operation.

In the 1850s much higher grade ores were found nearby. By now the Cape Colony was under British control, and reports from a British explorer named James Alexander had rekindled interest in the idea of extracting copper ore in the area, smelting it locally and transporting copper ingots to the coast. The copper boom of the 1850s saw entrepreneurs scrambling to establish new mining companies, raising large amounts of investment capital on the Cape and London markets. Many prospects in South Africa were highly speculative and some downright fraudulent, but others quickly became highly profitable.

Zinc

The nearest current mining boom to Okiep is happening a hundred miles east near Aggeney. The existing Black Mountain mine here has been producing zinc, copper, and lead since 1980, all of which are exported via the Sishen-Saldanha line. Mining is now being greatly expanded with the opening of the neighbouring Gamsberg zinc mine. Driven by a buoyant global market for zinc, Indian owners Vedanta have begun working a rich deposit found 40 years ago. They plan to extract 214 million tonnes of ore over a 30 year period.

The Gamsberg mountain sits within the Succulent Karoo Biome, designated one of the world’s 36 ‘biodiversity hotspots’. The name Gamsberg derives from ‘||gams’, meaning ‘water’ in the click language of the Nama people who lived there. In the ravines of the mountain are two permanent springs, very rare in this landscape.



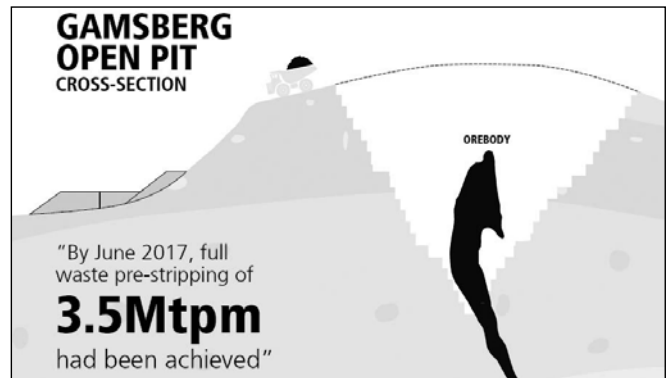
Gamsberg, showing recently completed access ramp, v-cut and the beginnings of a very large 'waste rock pile'. The plateau behind will eventually all be mined to depth, as shown in the Vedanta slide below. Mtpm stands for million tons per month.

The pastures of the mountain plateau, described by a 19th century Cape government surveyor as 'excellent', were used by Nama in centuries past as part of a longstanding system of transhumance, alongside highly seasonal grazing on the surrounding arid plains. Later as the Cape frontier expanded, farmers of European descent replaced the Nama and grazed their own cattle on the mountain.⁴

Vedanta's mine will hollow out this spectacular inselberg mountain, which they acknowledge to be 'the core of the Critical Biodiversity Area determined in the Namakwa District Bioregional Plan'. Direct biodiversity impacts will allegedly be 'offset' by enhanced conservation of similar habitats nearby. Under these offset plans Vedanta will take control of further large areas of land in the area. How effectively these areas will themselves be protected from future mining is unclear.⁵

Plans for Gamsberg also include trucking millions of tonnes of zinc concentrate hundreds of miles through the desert, for processing at the refinery attached to Vedanta's Skorpion Zinc mine near Rosh Pinah, across the border in southern Namibia. An older zinc mine at Rosh Pinah, approaching the end of its life, was recently bought by Canadian firm Trevali. A wave of redundancies preceded the sale, prompting strikes and allegations of racist management practices. Such tensions are rarely far below the surface in post-apartheid Namibia and South Africa.

National borders and long distances are not major obstacles for globalised mining companies. Vedanta's movement of zinc concentrate between South Africa and Namibia is positively local compared to the activities of Dundee Precious Metals (DPM), the Canadian owners of the Tsumeb copper smelter in northeast Namibia. This plant, again initially constructed to serve an adjacent mine, processes a quarter of a million tonnes of copper ore concentrate a year – but very little of this is now Namibian. Half is imported from DPM's Chelopech mine in Bulgaria, and most of the rest comes from Chile and Peru.



The Tsumeb smelter specialises in producing copper from 'dirty' ore containing high levels of arsenic and sulphur, a process banned in many countries on environmental grounds. An open waste pile of toxic arsenic compounds sits next to the town. The sulphur is processed into sulphuric acid, which is transported by rail to Rössing, for use in leaching uranium ore.

Uranium

Namibia is one of the world's top five producers of uranium, and Rössing has produced more uranium than any other mine in the world. The main pit at Rössing, majority owned by Rio Tinto, is 3.5km long and 400m deep. It was opened in 1976, while Namibia was under South African control. The apartheid regime's desire to access nuclear power and weaponry while under sanctions led it to exploit a low-grade ore body that might have otherwise been uneconomic.

In 2016 Rössing mined 24 million tonnes of rock, of which eight million tonnes were uranium-bearing ore. Processing this ore into 1850 tonnes of uranium oxide or 'yellowcake' (the basis for nuclear reactor fuel) required 2.6 million cubic metres of water, as well as 200,000 tonnes of sulphuric acid and other chemicals. Radioactive dust, chemical pollution, water use and energy demand all pose significant challenges in this arid environment.

There are currently two other active uranium mines in Namibia. Adjacent to Rössing on the other side of the ephemeral Khan river is the new Husab mine, which opened in 2017 and will soon become the world's second largest. Husab is majority-owned by the China General Nuclear Power Corporation. Since this company primarily supplies the Chinese market on behalf of the Chinese state, it is largely unaffected by global market price fluctuations. Paladin, the struggling Australian owners of the Langer Heinrich uranium mine in the Namib Naukluft National Park, are currently expected to sell their majority stake to another Chinese company.

While the anticipated 'uranium rush' was considerably slowed by the slump in uranium demand after Fukushima, there are nonetheless at least fifteen further uranium prospecting and mining projects at various stages of development in the Namib desert.⁶

The next mineral rush in Namibia may well be for more 'exotic' minerals used in electronics and batteries. Several viable deposits of tantalum and lithium have been identified. Gold mining is expanding rapidly, and offshore oil drilling is also imminent – the subsea geology of the Atlantic Ocean off Namibia is similar to that of the productive oilfields off neighbouring Angola.

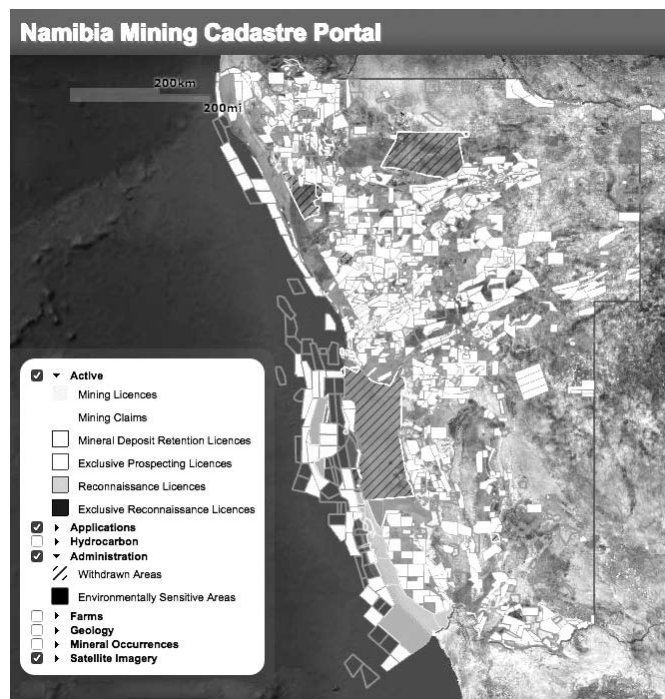
Impacts, Benefits and Politics

Observing large-scale mining close up is a sobering experience for anyone with environmentalist leanings, especially since the global mining industry is in a phase of rapid expansion to which there is no obvious end in sight. Namibia is just one of many frontiers. Meeting even current timid global targets on carbon emissions and biodiversity conservation will surely be impossible if this trajectory continues.

Mining companies and their political allies often respond to criticism by pointing out that pretty much everything consumed in the modern world is either farmed or mined, and that environmentalists also have lifestyles which rely on mining. Increasingly however, in Namibia and elsewhere, a more sophisticated argument is deployed. Revenue and sponsorship from mining and other extractive industries is presented as a key source of conservation finance.⁷

Effective scrutiny of mining requires asking in each case not only what the impacts are and what revenue is generated, but also exactly what purpose the material being mined serves, how much of it is really needed, and exactly who stands to benefit from its extraction. To take a few of the cases mentioned here, the extraction of copper and iron has devastating impacts, and the scale on which they are now consumed and mined seems clearly unsustainable. But these metals are at least genuinely useful, and both have long been part of human civilisation in Africa, as elsewhere. The same is not obviously true of ilmenite or diamonds. Uranium, given its actual and potential impacts, arguably just needs to stay in the ground. The fact that mining a given mineral is profitable does not in itself make doing so a good idea.

Post-apartheid governments in South Africa and Namibia see the powerful international mining companies as welcome agents of growth in their mineral-rich but cash-poor countries.



Areas of Namibia currently covered by mining or exploration licences. More detail at <http://portals.flexicadastre.com/Namibia/>

Well-intentioned legislation, aimed at ensuring that not all the profits are exported, obliges the companies to operate through joint enterprises with minority local partners. Sometimes these local partner companies are state-owned. Sometimes they are privately owned by members of new elites, often relatives and friends of prominent politicians. Allegations and suspicions of corruption are widespread. Even without any dubious practices though, both versions of this model effectively ensure that the priorities of governments remain closely aligned with the priorities of powerful mining companies.

As a result, environmental, social and labour issues arising from mining tend to be approached only in ways agreeable to the companies. Tax revenues, while substantial, are often reduced by the companies' ability to use their influence to negotiate favourable terms. Usually most profits go abroad, just as they did in the days of the VOC or the British Empire. Here as elsewhere, a closer reading of historical processes of extraction may help make sense of what is happening today.

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- 7 See eg <http://tinyurl.com/B2Gold-rewilding>

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