

Our dangerous addiction

A farmer tripped over a doorstep and our Pacific neighbours become wastelands. It made us rich, and we'll soon pay the price, writes Charlie Mitchell.



A Ravensdown topdressing plane delivering fertiliser.

The story went like this: Albert Ellis, a Waikato dairy farmer and prospector, tripped over a sturdy doorstep in the Sydney office of his family's company that was said to be made of petrified wood.

Ellis had it tested and discovered it was made of phosphate. It led him on a quest to the Pacific to find where the rock came from, which took him to Nauru, a small island annexed by Germany.

Predicting political complications, he went to the next best place, Banaba (or Ocean Island), an even smaller island around 200km away. After landing on the island, Ellis was struck by its potential: "If Ocean Island is what I think it is, there is a fortune in it, if not several," he wrote in his diary.

Shortly after arriving, Ellis thrust a contract at a Banaban man he assumed to be a representative (he wasn't), who signed away the rights to the island's phosphate for 999 years through a contract written in a language the Banabans couldn't understand.

Through a deal negotiated with Germany, phosphate was extracted from Nauru, too.

For many decades, much of the phosphate from Banaba and Nauru was shipped to New Zealand and Australia, well below the market rate, and spread on farms by planes piloted by war veterans. New Zealand enjoyed decades of cheap phosphate, which became lucrative meat and wool. Few things are as responsible for the country's economic successes as the exploitation of its Pacific neighbours.

Although it made New Zealand wealthy, its imperialism in the Pacific, driven by a thirst for cheap phosphate, is an ugly

GROWING PAIN

New Zealand's dangerous addiction to fertiliser

chapter in the country's history.

Banaba today is largely uninhabitable, with most of its former residents displaced to Fiji. The island is littered with old machinery left by miners, and most of the island's land mass has been hollowed out. When Nauru became independent, it became briefly and notoriously rich on its remaining phosphate before the economy crashed.

After exhausting its sources of phosphate rock, New Zealand had to look elsewhere.

Because phosphate rock is a precious resource, and one that is widely used, those who have it are keen to use it for themselves. New Zealand's usual trading partners, like the US and China, use much of their own phosphate internally.

The remaining options for New Zealand weren't great. Nearly all of the world's useable phosphate is in North Africa, in countries prone to instability.

It decided upon the mine in Western Sahara, run by Morocco. The relationship has since entered its third decade.

Exploring the options

The answer to the fundamental question – is there any viable alternative to buying phosphate rock from Western Sahara – is yes. Sort of.

While many other countries have stopped buying Western Saharan phosphate, in part due to pressure on corporations to exercise social responsibility, New Zealand is in a bind.



Phosphate from Western Sahara, spread widely on New Zealand farms, is low in the heavy metal cadmium and in fluoride.

KELLY HODEL/STUFF

New Zealand is rare among agricultural nations for its high rate of pastoral farming. Between 80 and 90 per cent of New Zealand's agricultural land is dedicated to animals, which has been largely consistent for a century. Other major farming nations, like Canada, have more diverse land uses, such as large tracts of horticulture.

It means New Zealand needs to grow a lot of grass, which is eaten by animals, requiring more grass (as well as other crops used for animal feed). Pasture-based farming is lucrative for New Zealand. It resulted in \$23b in export revenue last year, meaning it's the country's most valuable export by far. But it's heavily reliant on fertiliser, particularly phosphorus, to grow that pasture.

The recipe for Superphosphate in New Zealand is specific, and all the infrastructure built to process phosphate rock

centres around it.

It involves a blend of phosphate rocks from different sources, much like coffee.

For both of the major importers of phosphate, farmer co-operatives Ballance and Ravensdown, about 70 per cent of that rock is from Western Sahara. The rest is from countries that include Vietnam, South Africa, and Christmas Island in the Indian Ocean.

The major appeal of those sources is that the rock is sedimentary, not igneous. That means it's finer and easier to process.

The blend results in a product that has some ideal qualities. It can be dropped with precision, doesn't smell, and has a high concentration of phosphorus. The suppliers are likely close to a port, which keeps costs down.

Because there is no viable alternative to Superphosphate in a pastoral economy, it needs to be found somewhere, and the

Western Saharan product fits the recipe.

For the co-ops, the geopolitical drama is a major concern, but the alternatives are no better. "Unfortunately, where most of the phosphate is in the world, there are political issues," says Mark Wynne, Ballance chief executive.

Because much of the world's phosphate is in North Africa, other potential suppliers would include countries such as Libya, Jordan, or Algeria.

The company has recently been weighing up Togo, in West Africa, as a potential supplier.

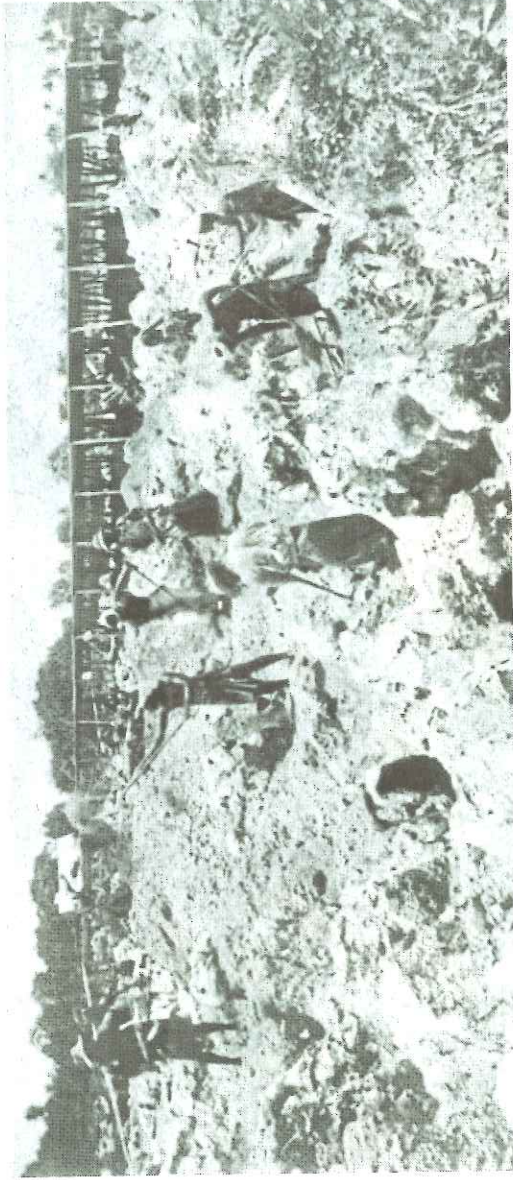
The conflict in Western Sahara is a "huge issue", Wynne says, but one far beyond the remit of a New Zealand co-operative. "It's way above any issue we'd get involved in in our station in life," he says.

"It's certainly well-known and debated at the United Nations Security Council, and, to be honest, that's the only place where a solution can come."

Critics, however, argue that the company is inserting itself into the issue by continuing to trade there. Wynne disagrees: "From my point of view, what prolongs the dispute is that both sides have failed to get into a room to negotiate a settlement."

Its competitor, Ravensdown, has much the same view. Both source similar quantities of phosphate from Western Sahara, from the same mine.

"When you look around, every source has some challenges," Ravensdown supply chain manager Mike Whitty says. "The reality is, with many of them, some are not options because the product is all consumed internally and further processed, but clearly there's a number of challenges as you go through where phosphate comes from – political issues, unrest,

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Workers dig for phosphate on Banaba, the Kiribati Island formerly known as Ocean Island.

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hit New Zealand's exports if cadmium levels keep rising.

It's not yet clear whether they will keep going up. For many years, cadmium levels had been rising steadily, but recently they seem to have plateaued.

Kim isn't convinced this is good news: he has theorised that high zinc usage on farms may be layering on top of the cadmium, pushing it downwards, towards groundwater.

In response to the concerns about cadmium, the fertiliser industry self-imposed limits on cadmium – “so high they're sort of out of keeping with any realistic number it's likely to get to in 100 years”, Kim says – but limits nonetheless. It has to be careful to source phosphate rock low in cadmium, otherwise it could breach its own limits, or those of a major trading partner.

That's a big tick for the Western Saharan phosphate: it is low in cadmium.

But cadmium is just one issue, Kim says. He is particularly concerned about fluorine, another phosphate byproduct, which has also been building up.

While cadmium can get into food, fluorine can get into the animals themselves through grazing, which can be deadly.

Kim's research has shown 90 per cent of tested dairy farms in Waikato and Bay of Plenty exceeded the lower threshold for fluorine concentrations that protect animals from chronic fluorosis. In simple terms, they are entering the danger zone. “As the concentrations get high, you get the possibility of animals grazing that land developing chronic fluorosis over time,” Kim says.

“It raises the possibility that if you fast-forward a few decades of Superphosphate use, you may not be able to graze animals because they'd simply become poisoned by the soil they're grazing.”

There was a “genuine mid-term risk” of large areas of agricultural land becoming unsuitable for particular types of primary production, his research concluded.

That's a second tick for Western Saharan phosphate: it's low in fluoride.

It is, however, high in uranium, the other major contaminant. Soil testing shows uranium is also accumulating in

New Zealand soils, albeit at concentrations far below the risk level.

And there's one final issue, Kim says. The development of some phosphate fertilisers, like Triple Superphosphate, comes with an unavoidable byproduct called Phosphogypsum, which is radioactive. Getting rid of a radioactive byproduct is rarely easy – but New Zealand's solution is.

“The answer to how do you dispose of it,” Kim says, “is that you spread it in a very thin layer across New Zealand.”

To opponents of the Moroccan occupation, the position of the fertiliser companies has been enabled by the co-operative economic model, which makes them resistant to social pressure.

A major factor in other fertiliser companies

withdrawing from Western Sahara was pressure on investors. Some investment

funds, including the world's largest, the Norwegian

Sovereign Fund, will not invest in trade with Western Sahara.

Several European banks have done the same, and the Western Sahara crisis often features on sustainable investing lists which automatically blacklist certain companies.

A host of shipping companies have also refused to charter their ships for trade from Western Sahara, including the world's largest shipping company, Maersk.

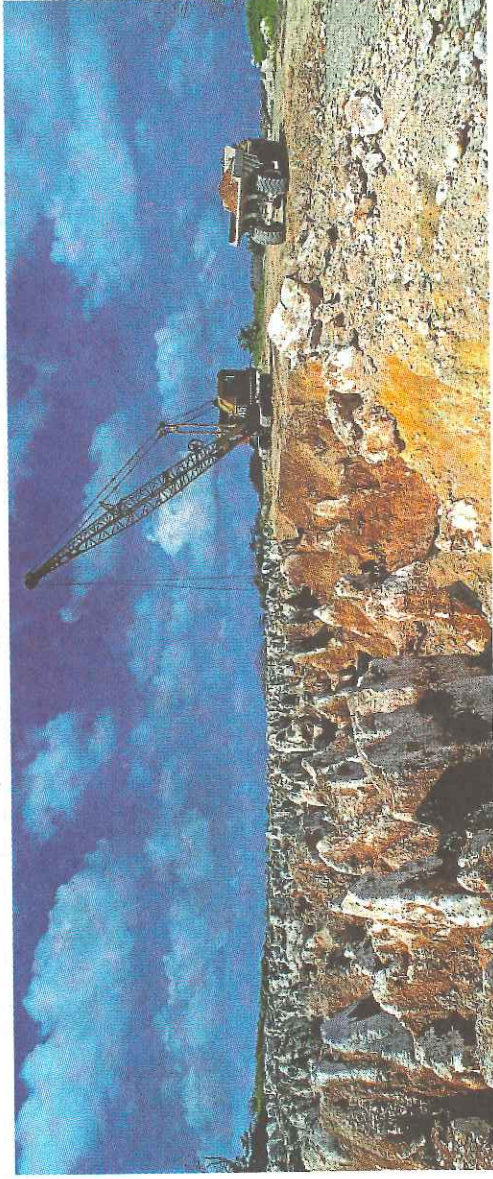
The Saharawis, buoyed by their success in the South African courts, are clear that the strategy of economic pressure will continue, even against the brick wall that is the New Zealand co-operatives.

That means advocating to New Zealanders directly, and dragging it through the international courts, if need be.

“[New Zealanders] should be aware that every time they have their breakfast cereal they participate in a small way in the crime committed by New Zealand companies,” says Kamal Fadel, the Polisario Front representative.

“New Zealand has always played positive and leading role on issues related to human rights, peacekeeping and the environment.”

“We hope Western Sahara will not be the exception to the rule.”



A now-exhausted phosphate mining site on Nauru left a barren terrain of limestone pinnacles.

AUSCAPE/UGC VIA GETTY IMAGES

had unexpected side-effects.

Because phosphate rock is mined, it isn't pure. The mineral you want in the soil, phosphorus, is just one part of the rock. Other parts contain cadmium, fluorine, and uranium, heavy metals that are hidden like stowaways.

The properties of phosphate rock differ wildly, depending on where it comes from. Some sources have much higher levels of these heavy metals than others.

The phosphate rock from the Pacific was cheap and plentiful, but it had an unfortunate downside. It was high in cadmium.

While much of the phosphorus in Superphosphate is taken up by plants, the heavy metals – cadmium, fluorine, uranium – stay in the soil, slowly accumulating.

Cadmium is similar in many respects to mercury, and in some parts of the country, the buildup has reached a point where it has

some countries putting quotas, taxes and other constraints on access.”

Whitty says Ravensdown is keenly aware of the political situation in Western Sahara, but the company defers to the UN process.

The refugee camps on the other side of the wall are a matter for the UN to resolve, he says. “We're going by what the UN are trying to achieve and what they've stipulated... We've looked at what the UN are doing very closely. It's something we're very aware of.”

“There's clearly political issues there between different parties, and it's certainly not something we'd enter into it.”

Contamination

The issue is becoming even more complicated by a growing realisation that decades of carpet-bombing phosphorus on large parts of the country have

become a concern.

“The main thing people are, or should be, concerned about with cadmium is that some of it's taken up in food,” says Dr Nick Kim, an environmental chemist at Massey University. “[Cadmium] is similar in concept to lead and mercury and it's about as toxic as either of those.”

If you were to dig into the soil from a Waikato dairy farm, you could detect almost every element of the periodic table. But some would be in much higher quantities than others, far higher than the background levels.

Food is rarely tested for cadmium, but levels in some soils, particularly in the Waikato region, are approaching danger levels. Some food types can already exceed food safety levels: namely certain types of leafy vegetables, potatoes, and animal kidneys and livers.

If a major trading partner put strict levels on cadmium, it could

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