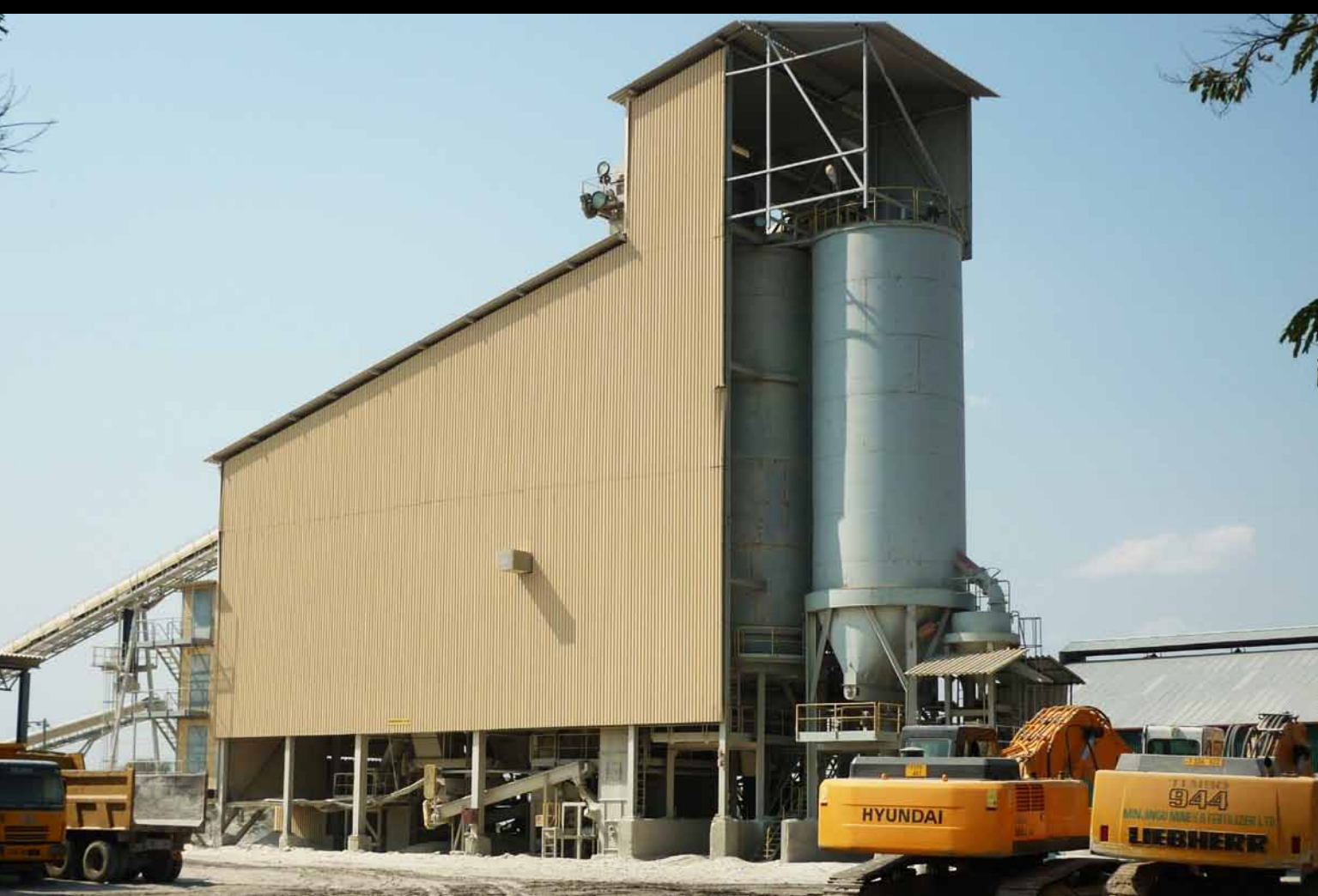


MINJINGU MINES & FERTILISER LTD

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IN THE PINK

Agriculture in many parts of Africa is still struggling to fulfil its potential. Anup Modha, general manager of Tanzania-based Minjingu Mines & Fertiliser, explains how the company has been using environmentally friendly local resources to achieve food security and poverty reduction



It was over 56 years ago that South African mining company Gold Fields identified a radiation anomaly on the edges of Lake Manyara in what was then Tanganyika during an aerial survey of the region. The anomaly turned out to be a rich phosphate deposit, ideal as a fertiliser for the region's soil. So in the 1970s the independent Tanzanian government stepped in to develop it into a mine, constructing a beneficiation plant on the site and transporting the output from there to the Tanzanian Fertiliser Company plant at the port of Tanga some 575 kilometres to the east. During the early 1990s, the fertiliser plant at Tanga ceased to operate and the mine also fell into disuse. However, it was given a new lease of life in 2001 when, as part of a wider privatisation programme, it was acquired by Minjingu Mines & Fertiliser.

“We realised we had a very good quality of phosphate,” explains general manager Anup Modha. “It was originally guano, formed from the bones and droppings of fish and flamingos that inhabited Lake Manyara millions of years ago, during the Pleistocene era. Because of its biogenic organic origin, it's very reactive and can be used as a direct application fertiliser, similar to TSP [triple superphosphate] in application.” The company began producing the powder form directly from the site's beneficiation plant and began developing a market for it.

“Our main market is subsistence farmers,” he continues. “But they resisted the use of fertiliser in powder form.” Not only had they become accustomed to using fertilisers in granular form, they also found



View of the phosphate mine



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The granulated product

the powder harder to apply economically as it could be dispersed by the wind. And economy was critical to their livelihood. “So we began exploring the possibility of granulating the product.”

This was a distinct challenge, as rock phosphate is normally made reactive by use of sulphuric acid or phosphoric acid and then granulated; and so far, rock phosphate granulation had been carried out only in a laboratory. “We believe this is the first commercial-scale granulation of rock phosphate in the world without the use of any chemical processes or binders,” says

Modha. Today, the market for this granular form of phosphate is increasing significantly as the product is accepted.

The next innovation has been to incorporate a blending plant into the granulation facility, to mix the phosphate with a range of other plant nutrients and micronutrients. The blending plant was brought into production in 2010, and at a combined cost for the two plants of around \$5 million.

The fertilisers produced from the Minjingu phosphate deposit have some unique properties. The natural phosphate



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has both fast release and slow release components, and these are essential to the long-term nourishment of the crop and an increased harvest. In contrast to chemical fertilisers, the product contains a variety of minerals and micro-nutrients that are essential for healthy crop growth, and has high concentrations of bone calcium and silicic acid derived from the original organic material.

Calcium performs a function similar to that of liming, reducing the acidity of the soil and promoting the uptake of nutrients. Bone calcium, meanwhile, is not easily washed away and tends to have a sponge-like nature, and this ability to retain moisture is invaluable in a climate where drought is a constant threat. The silica is invaluable for increasing disease and pest resistance, and strengthening plant growth.

Agriculture is of primary importance to the Tanzanian economy, but encouraging more farmers to spend money on fertilisers has been an uphill struggle. “The farmers face a number of challenges,” Modha explains. “They are poor and most simply haven’t been able

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Workers in action inside the plant

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to afford fertilisers. But there is also a negative perception about fertilisers—a belief that they spoil the soil. So a great deal of education needs to be done.”

Minjingu Mines & Fertiliser is doing what it can to tackle these issues. As the fertilisers are produced locally, their retail price has been pegged significantly below that of their competitors, and when combined with government subsidies aimed at improving agricultural productivity, the fertilisers are far more affordable. “We are also collaborating with government institutes and NGOs who are involved in educating the farmers,” he continues. “We provide free fertilisers for their training programmes so that they can demonstrate their use, and the farmers can see the improvement in crops.”

Progress is being made, but there is still a long way to go. Today, Minjingu Mines & Fertiliser not only markets its fertilisers in Tanzania, but exports to most of the surrounding countries including South Africa, Kenya, Uganda, Zambia, Burundi and Rwanda. “In sub-Saharan Africa we use about eight kilos of fertiliser per hectare compared to the rest of the world which uses about 200 kilos. The maximum usage here is in South Africa which uses

about 50 kilos per hectare. And this is a crisis. We think of it as mining the soil because more nutrients are taken out of the soil by the crops than they put in. And therefore the productivity of the soil is continually declining.”

Looking to the future, the mine itself has deposits of 10 million tonnes, which at the current rate of extraction means a mine life of 100 years. And there are further

“WE ARE LOOKING AT BUILDING A TSP PLANT AT THE SITE BECAUSE WE HAVE THE RESOURCE AND THERE IS A GLOBAL DEMAND”



Site machinery

concessions nearby. In terms of satisfying demand as the use of fertilisers becomes better understood in Africa, the Minjingu Mines & Fertiliser beneficiation plant has an output capacity of 100,000 tonnes a year, but is currently running at just 30 per cent of that capacity. So there is plenty of scope to increase output.

“We are also looking at building a TSP plant at the site because we have the resource and there is a global demand,” Modha reveals. Such a project is likely to come at a cost of around \$50 million, as it will incorporate a range of chemical production facilities, and may also include a wet beneficiation plant to improve the quality of the product. “If we go ahead with this, we’ll begin construction next year,

and go into production in 2015.”

Today, the highly alkaline waters of Lake Manyara continue to be home to the flamingo, the beautiful and exotic bird upon whose droppings and remains the entire Minjingu Mines & Fertiliser business is built. It’s interesting to think that this wonderful National Park with its lush vegetation and wildlife could be home to an industry that is improving food security and achieving poverty reduction through the use of local resources for a large portion of the African continent. **BE**

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