

The 10-year miracle

The story of mining in North-Western Province



Zambia
Chamber of Mines
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This booklet is based on interview material obtained during a one-week visit to North-Western Province. We visited Kalumbila, Lumwana and Solwezi, and the three mines there. Interviews were conducted with mine employees, mine suppliers, and residents of Kalumbila, Lumwana and Solwezi.

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Foreword

A fascinating story

This report tells the fascinating story of how North-Western Province – and Solwezi in particular – went from being a sleepy provincial outpost ten years ago to a major mining centre that produces nearly two-thirds of Zambia’s copper. Not for nothing is it sometimes known as “The New Copperbelt”.

The story is told through the eyes of the people who live and work there – from mine employees and business owners to taxi drivers and ordinary citizens. It reveals how the seemingly unconnected act of investment in a new mine can have a startling and immediate effect on the everyday lives of communities and towns, creating employment and opportunity, boosting incomes, and spurring the creation of businesses large and small.

Within barely a decade, North-Western Province has seen the creation of not just one new mine, but three – Barrick Lumwana, as well as Kansanshi and Sentinel mines, both majority-owned by First Quantum Minerals. When all the associated infrastructure is included, it represents an investment of some \$7 billion. That is the single-largest round of direct fixed investment of recent years that a Zambian province has seen in so short a space of time.

This is not a dry, academic report; rather, it is a vivid, anecdotal account of the effect the mines have had on the economic and social landscape. It is accompanied by a video, *Booming Solwezi – how mining has changed a once sleepy town*, which you can find on www.miningforzambia.com; I heartily recommend it.

For many, the contribution of the mining industry to Zambia’s economic health and social well-being is often seen through the narrow lens of tax revenue and royalties – as if nothing else really matters. What this booklet will show is that tax revenue and royalties, while important, are just the tip of the iceberg; the real, sustainable contribution the mines make every day is on the ground, in towns and communities, by being the catalyst for economic growth, employment and rising disposable income.

Nathan Chishimba

President: Zambia Chamber of Mines



Humble beginnings

N.W province was once a remote, sleepy provincial outpost

Off the beaten track

Siberia is perhaps too strong a word to describe what North-Western Province was like a decade ago, before the mines moved in; but the analogy is not entirely without merit. Tucked away in the far corner of the country, an hour's flying time from Lusaka, and bordered by Angola and the Democratic Republic of Congo (DRC), the province was one of Zambia's most remote areas.

With no real industry or commerce to speak of, its economy was characterised mainly by subsistence farming. Its capital, Solwezi, was essentially a provincial outpost for the government. The population was barely 100 000 people, a fraction of what it is today. The town had one main road running through it, very basic infrastructure and limited shopping facilities. Its airport was more of an airstrip.

Nathan Chishimba, executive director at Barrick Lumwana¹ and president of the Zambia Chamber of Mines², recalls the time: "Ten years ago, North-Western was the province that was by-passed by all the developments that were happening in the Copperbelt and Lusaka. It was the least populated province. Very sparse infrastructure. Everybody knew where it was, but no one wanted to go there."

It's all in the traffic

Given the absence of exhaustive, reliable statistics about the province back in those days, the personal recollections of its inhabitants are the most telling indication of what life was like. And the theme that crops up most frequently – in Solwezi, at any rate – is traffic, perhaps because it is the most visible illustration of how the town has changed.

Alexi Kabai, a driver from the Kansanshi Hotel³, taking his passengers to the airport during the morning rush-hour, recalls what traffic was like ten years earlier. "Back then, before the mines started, you could drive around for miles all day and see only three cars," he says, laughing. "One was from the hospital; one was from ZESCO and one was from the council."

Thomas Zimba, a taxi driver navigating the heavy traffic on the main road through Solwezi had a similar tale to tell. "You could get together with your friends in the middle of the road, put your stuff down and have a party! It would be at least three hours before you saw another car passing by."

Solwezi had one main road running through it, and very basic infrastructure

Brenda Kunda, CEO of Bresmar Building Materials⁴, a major supplier to First Quantum Minerals' Kansanshi Mine, recalls how hard it used to be to get into Solwezi from the outlying areas. "There was only one bus a day going in either direction," she says. "I remember occasionally missing the bus and having to walk all the way to Solwezi."



Lighting the fuse

Three new mines ignite N.W. Province's economic development

Lumwana – where it all began

As early as 1996, the small rural village of Lumwana, about 100 km from Solwezi, started to feel the first stirrings of mine-driven economic development. Exploration teams from the Australian mining company, Equinox Minerals⁵, had started prospecting in the area, and were busy defining the extent of the copper deposit.

It was a low-grade deposit – around 0.7%, compared to 3% or more on the Copperbelt – but with the right technology and investment incentives, it could be mined economically. Zambia had proved attractive to Equinox because it was a peaceful, stable country with favourable fiscal policies, a competitive Mining Act that had just been passed, and a good pool of mining skills.

To construct and develop the mine would require \$762 million. Equinox persuaded a consortium of 14 international banks to provide the money in the form of a record debt-financing package.

Construction started in mid-2006 and continued unabated, day and night, for three years. When it opened in 2009, in the presence of President Rupiah Banda and guests from as far afield as Australia and Canada, Lumwana Mine was Zambia's largest-ever greenfield investment. It was a moment of immense pride and achievement for the government, the local community and international investors.

Kansanshi – a challenging ore body

While Equinox Minerals was busy defining the extent of the ore body in Lumwana, another local copper deposit was attracting investor attention – Kansanshi Mine in Solwezi. Kansanshi was an old mine – copper had been produced there as far back as 1908 – but not a very successful one. Indeed, it was one of the least attractive assets in the portfolio of ZCCM (Zambia Consolidated Copper Mines) when Zambia's privatisation programme⁷ started around 1997.

Kansanshi has what geologists call a complex ore body, which means that the mineral-bearing ore is not easy to find and mine. First Quantum Minerals (FQM) acquired Kansanshi in 2001 – and this was despite the fact that the copper price was still languishing at record lows of around \$1 500 a tonne.

To surmount the problems of geology, the company secured \$300 million of bank financing and built a new, upgraded and modernised mine using the latest technology and expertise from all over the globe. It was completed ahead of schedule and reached commercial production in 2005. Within three years, the copper price had more than doubled, and Kansanshi was producing enough copper – and gold – to be profitable. It is now Zambia's largest corporate taxpayer.⁸

Sentinel Mine – a technological game-changer

Far from being a reason to sit back and rest on its laurels, the success of Kansanshi Mine prompted FQM to embark on an even more ambitious copper-mine project – Sentinel. The new Sentinel Mine⁹ would be even deeper into North-Western Province, about 150 km from Solwezi.

When the \$2.1-billion Sentinel mine was opened in August 2015, in the presence of President Lungu, it represented the single-largest upfront infrastructure investment in Zambia since the Kariba Dam¹⁰.

The mine had taken five years to build. Thousands of contractors were employed, and more than 265 000 tonnes of equipment were transported to the site, in 14 500 massive truckloads. There was nowhere for the mine's employees to live, and so an entire town – Kalumbila – was built from scratch. There was no existing power grid, so FQM had to construct more than 600 km of powerlines, running halfway across the country down to the west of Lusaka.

The new town of Kalumbila mushroomed and soon had more than 5 000 inhabitants. It boasted the country's second-longest airport runway, as well as a bold plan to become a thriving, diversified economy by the time Sentinel reaches the end of its commercial life in 25 years' time.

"Sentinel mine puts Zambia at the forefront of global mining technology," says John Dean, commercial manager. "It sets new standards in efficiency and productivity. It is a blueprint for future copper-mining ventures in Zambia and globally."



BIG. Sentinel Mine operates a fleet of these massive electrically powered rope shovels, which can lift more than 100 tonnes of ore in a single scoop



**“Sentinel mine puts Zambia
at the forefront of global
mining technology”**

The boom starts

Economic growth is unleashed on Solwezi and surrounding areas

Money starts flowing from the mines

By 2007, FQM's Kansanshi Mine was already at commercial production, pumping out 164 000 tonnes of copper a year. Thousands of workers and contractors were on the job every day, and the impact of their wages and spending was already having a major effect on the consumption of goods and services.

People needed accommodation, food, fuel, transport, clothing, electricity, airtime, entertainment, banking, insurance, schools – and that was just for starters. Kansanshi Mine itself was also consuming voraciously, spending millions of dollars every month on food, diesel fuel, explosives, electricity, machinery and equipment, spare parts, office equipment and the myriad other things necessary to run a modern mine.

Meanwhile, an hour up the road, Lumwana Mine was under construction and rapidly nearing completion. Buildings were going up, pipes were being laid, a dam was being built and electrical infrastructure erected. The busy construction site was hungrily devouring goods and services, from fuel and building materials to machinery, equipment and spare parts. By 2009, Lumwana Mine was in production, and North-Western Province was on the move.

Business rises to the challenge

The economic activity generated by Kansanshi and Lumwana irrigated the

economic landscape far and wide, causing hundreds of businesses – large and small – to take root and grow. They responded to the burgeoning demand for goods and services, and soaked up the new disposable income. Nowhere was this more visible than in Solwezi.

Small market stalls and kiosks sprung up on roadsides and in public squares, selling everything from food and drinks to cellphones and airtime. More mainstream businesses with proper premises and eye-catching signage started to appear, completely changing the face of downtown Solwezi. They ranged from hardware stores and auto repair shops to banks and insurance companies.

But perhaps the ultimate illustration of the growing wealth and disposable income of Zambia's latest mining town was when supermarket chain Shoprite opened its first store – which was followed by another one a few years later, as the first one was unable to keep up with consumer demand¹¹. Proper shopping malls have followed, the latest of which is the \$25-million, 10 000m² Solwezi City Mall¹², which opened in 2016.

No room at the inn

With more and more people flooding into Solwezi, accommodation was soon in short supply. Workers and contractors needed housing; and visitors needed hotel accommodation. If you owned a dwelling of any kind, you had no problem renting it out – whether it was a basic



SHOPPING. Shoprite is the flagship store at the \$25 million Solwezi City Mall



AVIATION. Passengers on Proflight's CRJ-100 passenger jet disembark at Solwezi Airport



TRUCKING. A mine haul truck at Barrick Lumwana on its way to pick up its next load of copper ore

or a luxury home with all the trappings. With demand outstripping supply, rents were sky-high.

Veronica Ryder, who was looking for land to build what would become the Kansanshi Hotel, recalls hearing stories of astute people taking out mortgages to build or acquire new homes, and paying them off in record time – sometimes in under a year¹³. Out-of-towners flocked in droves to the town's hotels, which invariably were fully booked, often for months at a time.

Rapidly growing Kansanshi was finding it increasingly difficult to find affordable accommodation for its employees, many of whom were coming from the Copperbelt. So, the mine hired professional architects to design and build an entire residential neighbourhood – Kabitaka – from scratch. The total cost was \$100 million. Although it targeted mainly mine employees, it was also open to Solwezi residents. By 2015, Kabitaka boasted more than 600 owner-occupied homes, commercial and other plots, a clinic, recreational facilities and two fee-paying schools. And in a first for Solwezi, Kabitaka had proper sewerage, street lights and a 6-million-litre water-storage facility¹⁴.

Grappling with growth

The mining boom hit Solwezi with the force of an express train. The once-quiet town found itself racing ahead economically in a fit of chaotic, almost un-disciplined growth¹⁵. Makeshift homes and informal businesses mushroomed; cars appeared everywhere; the population surged, along with disposable incomes.

This surging population put pressure on public services such as access to water, road infrastructure, and health and education facilities. This was all the more

so, given that North-Western Province was a relatively rural and underdeveloped region with very little of the long-established infrastructure of the more developed Copperbelt.

In response to the pressure created by the new mining activity, both Kansanshi and Lumwana mines embarked on major infrastructural projects. In 2012 alone, according to figures by the International Council on Mining and Metals, both mines spent nearly \$7 million in their respective catchment areas, building houses, clinics, roads, classrooms and market infrastructure¹⁶. Kansanshi also invested \$9 million in building a 2.8-km-long runway at Solwezi airport, which can now handle mid-size jets like the Boeing 737. Significantly, the local community in Lumwana was able to enjoy the benefits of electricity and running water, thanks to the electrical and dam infrastructure built by the mine to enable it to operate.

The economic activity generated by the new mines irrigated the economic landscape

Despite these and other efforts, both by the mines and the municipality, the development challenges posed by continued economic growth are by no means totally resolved, as a visit to Solwezi will readily attest to.

Grappling with growth in this manner is not peculiar to Solwezi: it is a global phenomenon that characterises any under-resourced region that suddenly experiences rapid growth for which it is not prepared.

A NOTE ON RAPID URBANISATION

Solwezi not alone

There are many other towns and cities both in Africa and worldwide that struggle with the unintended consequences of rapid and unexpected urbanisation.

Nairobi, in Kenya, has one of the world's largest informal settlements, Kibera, and struggles with adequate housing¹⁷. Nairobi is plagued by massive traffic jams. Infrastructure, roads and transport links cannot cope with the population growth. Lagos, in Nigeria, and Maputo, in Mozambique, face similar challenges, and also battle health issues, insufficient drinking water and unemployment¹⁸.

The South African city of Rustenburg has also experienced a population boom in the last two decades on the back of economic activity generated by platinum mining in the area¹⁹. The result, as in Solwezi, has been a housing backlog, public health issues, inadequate water and a lack of access to formal education.

This is not unusual, and the World Economic Forum highlights three key driving factors²⁰:

- Organic population growth: this is when there are more births than deaths, and is especially true in areas of high fertility, as in Africa
- Rural-urban migration: people from rural areas move to cities to improve their standard of living, and are attracted there by economic opportunity, employment and access to services. Other factors behind migration include rural conflict, droughts or floods, and a shortage of food or water.
- Connectivity: an increased ability of people in different regions to connect with each other through the availability of transport and communication infrastructure.

When it comes to possible solutions, proper urban planning can help both governments and local municipalities to mitigate the negative consequences of such urbanisation²¹. The new town of Kalumbila, in Zambia's North-Western Province, is a good example of such an approach – the town was designed from the beginning with the right levels of infrastructure (transportation, housing, hospitals, schools, shops, etc) to ensure it could cope with future growth (see page 13).

The Kalumbila story

A blueprint for economic diversification away from mining

Forward thinking

Inspired by a desire to start with a clean slate and avoid the chaotic development that had characterised Solwezi, First Quantum Minerals (FQM) funded and built a brand-new town, Kalumbila²², to support its Sentinel Mine, which started operations in 2015.

The town's long-term ambition is to become economically self-sustaining so that it does not depend on Sentinel Mine for its existence.

"Johannesburg is a good example of a mining town which outgrew its mining origins, and is today a global business centre in its own right," says Michael Kabungo, of the Kalumbila Town Development Corporation. "That's the long-term vision we had for Kalumbila."

It was a bold vision, and making it reality wasn't going to be cheap; but FQM reckoned the \$200-million investment would be worth it.

A radical concept takes shape

The Kalumbila project was driven by Gehl Architects²³, a Danish urban-design consultancy that has worked in more than 250 cities globally. Gehl partnered with three African design firms: Kama Associates and Arch Consult of Zambia, and Arup of Zimbabwe.

The town was designed around a handful of core principles, such as protecting and using nature; creating a good foundation for everyday life; and – most importantly – ensuring growth through ongoing private investment.

Kalumbila has an airport; proper infrastructure, sewerage and street lighting; shops, businesses and leisure facilities; good schools; good medical facilities; and quality housing which allows people to live in the town with their families. To encourage land acquisition, Kalumbila is owned by the Kalumbila Town Development Corporation, and not the mine.

And finally, to attract industrial investment, the government agreed to establish a Multi-Facility Economic Zone²⁴, set up just outside the town, that offers various fiscal incentives.

Quality of life attracts skills

It's only been a couple of years since the first phase of the town was completed; but there is enough evidence to suggest that the Kalumbila vision is starting to pay off.

The town has nearly 10 000 inhabitants – most of them work for the mine – who live in spacious well-designed homes rivalling anything that Lusaka has to offer. The streets are clean; vehicles cruise along proper roads with very little traffic; at night, people play basketball and volleyball under floodlights; there is a country club with a gym, restaurant and golf course; the Choppies supermarket is one of the busiest in the country; the Impala Suites hotel is full most of the time; the market stalls are busy, with traders coming from surrounding areas every day to sell their wares; and crime is so low as to be virtually non-existent.



CONSTRUCTION. Workers constructing the market area in Kalumbila; in the background is the Impala Suites Hotel

“The quality of life in Kalumbila is a key investor strength, especially when it comes to attracting skills from other parts of Zambia and other countries,” says Kabungo. “Nobody wants to relocate to a place that’s not pleasant to live in.”

Core to the town’s design philosophy was the need to attract private investment

Big investor interest

A \$40-million mill-ball plant is under construction in the town’s industrial zone, and is scheduled to begin operating in 2018²⁵.

An Australian company, Argonaut Exploration, is busy prospecting for copper in the surrounding area on behalf of Antofagasta, one of Chile’s main copper-mining companies. A major Ndola-based earthmoving company doing the earthworks for the mill-ball plant, Joe’s Earthworks and Mining, is considering setting up in the town.

An entire neighbourhood of 50 new houses is nearing completion near the town centre, thanks to an investment of \$1.4 million by Zambia’s Workman’s Compensation Fund Control Board. The Fund has signalled its intention to build a further 100 houses, with a total investment value of more than \$3 million. These investments allow the Fund to broaden its investment portfolio by diversifying out of government securities.

“We are very encouraged by this strategic decision of the Fund to invest in Kalumbila,” says Kabungo. “We see it as a sign of faith by the government in the long-term future of the town.”

Administrative challenges

Executing a vision as bold and ambitious as Kalumbila’s is not without its administrative challenges. There continue to be lengthy delays in local government when it comes to the granting of land-title to investors, as well as the necessary permits, licences and approvals.

The airport runway is an example: an overall approval and environmental process that should have taken three months ended up taking one-and-a-half years. Then there was the paperwork for the town’s \$2-million sawmill: it took so long to get a licence to process and export the timber that the delay put the jobs of its 120 workers at risk²⁶.

However, Kabungo remains optimistic. “We are hopeful that with each milestone and each success, government’s administrative support and efficiency will improve.”



BANANAS: An aerial view of Kalumbila, showing the residential areas which are known in the town as “bananas”.



PRESIDENTIAL TOUR: President Edgar Lungu and his entourage visiting Kalumbila in 2015


Zambia Mining PLC



INVESTMENT: Veronica Ryder, owner of the Kansanshi Hotel in Solwezi; more than \$5 million has been invested in the hotel to date.

Massive supplier spending

It sustains businesses in N.W. Province, the Copperbelt and Lusaka

Where the money is

North-Western Province's mines are gigantic production sites that consume goods and services in quantities so huge as to defy comprehension. Their respective operating costs easily run into a few million dollars a day.

Food, fuel, electricity, office supplies, machinery, spare parts, pumps, instrumentation, electrics, explosives, tyres, safety equipment, crusher liners, mill-balls – Andy Hickman, Commercial Manager at Kansanshi, says the list of things the mine has to buy is so long it numbers some 56 000 distinct line items.

“To keep the mine operating, we spend around a billion dollars every year, and that doesn't include wages or taxes,” he says. “On an average day, we use a hundred tonnes of explosives and more than three hundred thousand litres of fuel. Our monthly electricity bill is several million dollars.”

Like all the province's mines, Kansanshi's actual supplier spending in Solwezi varies from year to year, depending on its operational and investment requirements. In 2011, it was \$22 million; it then soared to \$117 million in 2014, before falling back to \$31 million in 2016²⁷.

Targeting Zambian suppliers

Obvious considerations of price, availability and quality notwithstanding, the

mines first target their supplier spending at local businesses. Whatever cannot be sourced locally is then obtained further afield – mainly from the Copperbelt, but also from Lusaka. Whatever cannot be sourced from within Zambia is imported.

“Unfortunately, Zambia does not have an industrial base,” says Hickman. “Most of what the mines buy – particularly machinery, parts and equipment – is not manufactured in Zambia. So, it has to be imported.”

However, imports still benefit Zambian companies considerably, as the transactions are channelled through the Zambian subsidiaries of big international mine suppliers. Many of them have offices in the major centres such as Solwezi, Lusaka and towns on the Copperbelt. While on a smaller scale than their parent companies, these offices still employ people, consume goods and services themselves, and pay taxes.

If machinery and equipment is imported, services are provided locally. The International Council on Mining and Metals estimates that “close to 100 percent”²⁸ of services used by the mines are procured from Zambian companies, where most of the value added remains in Zambia.



Building capacity among suppliers

Barrick Lumwana, Kansanshi and Sentinel all run various programmes aimed at building capacity among Zambian supplier firms. This involves both training, funding and technical support, with the objective of helping firms to tender for supplier work and execute it properly.

For example, a series of training workshops by Kansanshi for potential suppliers boosted the amount of mine business going to local Solwezi companies from \$22 million in 2011 to more than \$100 million barely three years later²⁹. The workshops showed suppliers how to tender, how to manage the resulting supplier contracts, and how to optimise the use of materials and maximise profit.

Barrick Lumwana runs a comprehensive Community Contractors Development Plan³⁰ to help small contracting companies in the Lumwana community tender for mine business. The mine builds profiles of potential companies, determines what kind of business they are best suited for and matches them to procurement opportunities. Suppliers are also provided with business and management training, and are linked to sources of finance so that they can fund their work.

Supplier initiatives such as these are all the more important as Zambian suppliers face serious competitiveness challenges, as we will see in the final chapter.

Far from the action

Barrick's Lumwana Mine is an hour away from Solwezi, and does not have as many businesses on its doorstep. Estina Phiri-Mukonde, Supply Chain Contracts Co-ordinator at Lumwana, explains how the mine uses three zones to prioritise its supplier spending.

“In the first zone, the communities around the mine, we spend about six million dollars a year sourcing semi-skilled and unskilled labour,” she says. “They do everything from bush-clearing and road maintenance to small construction projects and building maintenance. We also buy calico bags and wooden pegs made in the community – they are used by our geologists.”

The second zone encompasses the rest of North-Western Province, including Solwezi. “Here, we spend upwards of ten million dollars annually, mainly on purchasing general hardware, building materials, education services and general contracting. Most of this is spent in Solwezi.”

Nearly 100 % of the services used by the mines are procured from Zambian companies

The third zone takes in the rest of Zambia, particularly the Copperbelt, but also Lusaka. “The reality is about seventy percent of our total Zambian supplier spend goes to this zone,” says Phiri-Mukonde. “That’s where the mining skills are. That’s where the large companies are.”

Supplier stories

Suppliers to the mines in North-Western Province come from different towns, different industries and different areas of expertise. But they all owe their existence in one way or another to the mining industry.

Brenda Kunda runs Bresmar Building Materials³¹, and supplies the high-quality, washed sand that is used in Kansanshi’s smelter at the start of the smelting process. “Before we came on board, the sand was shipped in from the Copperbelt,” says Kunda. “We supply it cost-efficiently because we are closer to the mine.” The company has expanded considerably since becoming a supplier. It has invested in new technology, has more than 50 employees and is now a major contributor to the Solwezi economy.

Genesis³², headquartered in Lusaka, is an IT equipment company that sells items such as networking equipment, printers, laptops and servers. It employs just over 40 people, and also has an office in Kitwe. The company has a diverse corporate customer base that includes banks and insurance companies; but it is FQM’s mines – particularly Sentinel and Kansanshi – that are the main customers. “They play a massive role in our business,” says CEO Shaun Brannigan. “If it wasn’t for them, we would not be able to sustain our current employment levels.”

Proflight³³, headquartered in Lusaka, is Zambia’s main airline. It employs more than 180 people, and has a diverse fleet of modern aircraft. There are regular daily services to Solwezi in North-Western Province and Ndola on the Copperbelt. CEO Tony Irwin says Ndola is the company’s busiest route, and at least half of the traffic is mining-driven. “We’ve never done a formal analysis to see how much of our business is mining-driven; but then most of the non-mining business is so intertwined with mining anyway that it probably accounts for the lion’s share,” he says.

A multi-million monthly wage bonanza

Mine employment injects cash into the economy, sustaining many businesses

Irrigating the economic landscape

Every month, an estimated K150 million³⁴ in mining wages and salaries are paid out to the approximately 20 000 employees and contractors working at Barrick Lumwana, FQM Sentinel and FQM Kansanshi. After allowing for deductions in the form of Pay-As-You-Earn tax, and remittances of a portion of expatriates' monthly salaries, most of that money is spent in Zambia.

According to the HR managers of the mines, most of the money earned by mine personnel in the province ends up being spent in Solwezi, because of its extensive shopping and commercial infrastructure; but they estimate that a fair amount is sent by mine employees and contractors to various family members living in other parts of Zambia, particularly the Copperbelt and Lusaka.

"Employees and contractors working for the mines have a huge effect on the economy of North-Western Province, and Solwezi in particular," says Andy Hickman, Commercial Manager at Kananshi Mine. "They are buying food, renting houses, driving cars, sending their children to school – the list goes on and on."

What happens to all the money?

The people working for the mines use their monthly pay largely to sustain themselves and their families.

They spend money on rent or mortgage repayments, electricity, food, transport, fuel, airtime, banking, insurance, medicine, school fees, clothing and entertainment. Depending on what stage of their lives they are at, people may also be investing in big-ticket items such as furniture, electrical appliances and motor vehicles. Any money left over will go into investments and savings.

The regular injection of wages and salaries into the local economy explains the plethora of shops, stores and businesses of all sorts that have sprung up around Solwezi in the past decade.

The most recent example is the \$25-million Solwezi City Mall, which opened in 2016 and was built by African Property Investments, a shopping-mall developer from Mauritius. Its tenants include not only big-name brands such as Shoprite, Woolworths and Mr Price, but also at least a dozen Zambian-owned shops operating in areas ranging from books and catering to cosmetics and optometry³⁵.

"Without the presence of the mines, Solwezi would not be a viable investment destination," says Richard Herring, a company spokesman. "They provide the pool of disposable income that makes shopping malls viable³⁶."



WAGES. Members of Barrick Lumwana's sustainability department at the corporate head office

The disposable income from the mines makes Solwezi a viable commercial destination

The magic of the multiplier

How the multiplier effect has created employment and wealth

An explosion of economic activity

As the preceding chapters in this report have shown, the mines in North Western province do not exist in a vacuum; their presence creates waves of economic activity that flow outward in concentric circles, like ripples in a pond.

This is known in economics as the multiplier effect³⁷. Simply put, it refers to how an increase in one economic activity (e.g. mining) can cause an increase in many other economic activities (e.g. agriculture, transportation, engineering, banking, insurance, education, entertainment...).

Mineworkers spend their wages and salaries, which creates demand in the local economy and spurs the expansion of existing businesses and the creation of new ones; the mine procures goods and services from suppliers, encouraging the expansion of existing supplier businesses and the creation of new ones; all these businesses and their employees in turn spend money, creating yet more demand – and so on. Throughout the process, overall disposable incomes increase, resulting in the creation of wealth where it didn't exist before.

Evaluating Zambia's multiplier effect

Employment multipliers are often large in mineral-driven countries such as Zambia, according to the International Council on

A large industrial sawmill facility with a high ceiling and corrugated metal walls. Several workers wearing hard hats and safety gear are visible. In the foreground, a worker in a white hard hat and dark jacket stands near a large piece of machinery. In the background, another worker is visible near a large cylindrical container. The floor is made of large, light-colored tiles.

MONEY FROM TREES. This sawmill in Kalumbila manufactures wooden furniture for the local market and for export

Mining and Metals (ICMM). As well as direct employment (those working on the mine itself), mining also creates indirect employment (jobs created as mines procure supplies from local businesses) and induced employment (jobs created as employees of both the mines and their suppliers spend their wages and salaries, and so create additional demand and jobs in other industries).

In a 2014 report³⁸, *Enhancing mining's contribution to the Zambian economy and society*, the ICMM cites a World Bank study based mainly on FQM's Kansanshi mine in Solwezi. It estimated total employment in 2010 – direct, indirect and induced – at 300 000 people. “This implies an employment multiplier of more than five,” the report says. In other words, for every one direct job at Kansanshi Mine, an additional five indirect and induced jobs were created elsewhere in the economy. “The total number of jobs is likely to have increased even further since then, as direct mining employment has risen,” the report adds.

It's worth noting that in the years since the study was done, direct mining employment has increased steadily in the region, most notably with the opening of Kansanshi's \$900-million smelter³⁹ in 2015, the general expansion of production both at Kansanshi and Barrick Lumwana, and the coming on stream in the same year of FQM's new Sentinel Mine in Kalumbila.

The most recent figure for total direct employment at Lumwana, Kansanshi and Sentinel is 20 000. No study has been done in recent years to determine how big the multiplier effect in North-Western Province is today – it may be less than five, or even more than five. But the fact remains that mining in the province has created a significant number of indirect jobs, not just locally but also on the Copperbelt and in Lusaka.

Kansanshi Hotel – a case study

Solwezi's Kansanshi Hotel is a typical case study⁴⁰ of how the multiplier effect works, and how economic activity in one area (mining) can create economic activity in another area (hospitality and tourism).

Veronica Ryder, a Zambian hotel-school graduate, was working in London in the mid-2000s when news of the North-Western Province mining boom reached her. Excited by the business potential, she returned to Zambia with her husband to start a hotel. Overcoming countless challenges, the couple finally succeeded in securing a loan to help them fund the construction. It opened in 2010, and has since grown to become the town's premier hotel, used even by President Edgar Lungu when he overnights in Solwezi.

The hotel is primarily a business destination. Most guests are from the mining industry or work for organisations that are in some way related to the mining industry. Unsurprisingly, the hotel's fortunes are very much tied to those of the industry. “When the mines do well, Solwezi does well and we all benefit,” says Ryder.

At the height of construction, more than 100 people were employed on the site. Today, the hotel employs more than 60 people, ranging from chefs, waiters and barmen to housekeepers, gardeners, maintenance people and security guards. Ryder is particularly proud of her employees, many of whom have gone on to build their own homes, send their kids to decent schools and even start small businesses for their families.

The hotel injects some K300 000 into the local economy every month mainly through wages, the purchase of supplies (mainly food, toiletries and hardware), and municipal rates and taxes. Since the first brick was laid back in 2007, just over \$5 million has been invested in the hotel.



PROFITABLE FARMING: These women are among more than 25 000 people in the Solwezi area who have learned how to increase their crop yields through conservation farming

Tip of the iceberg?

Economic contribution significant, but even more is possible

So much more

As the preceding chapters emphatically show, mining's contribution to North-Western Province and the broader Zambian economy is real, significant and extensive. It touches lives not just in mining communities, but throughout the broader population. But, more is possible in terms of business expansion and employment growth.

Creating businesses around mining

Mining is rich in commercial and business opportunities for local companies. Even before a mine starts operating, infrastructure is erected (e.g. dams, roads, powerlines), and the sums of money involved are significant. And once the mine has started operating, it requires inputs such as plant, machinery, equipment and consumables; it also requires ongoing services such as catering, banking, insurance and logistics.

These commercial opportunities are sometimes referred to in development jargon as linkages, because they link into various sectors of the economy. There are upstream linkages (e.g. supplying plant and machinery) and sidestream linkages (e.g. supplying catering and banking services).

There are also so-called downstream linkages, which involves 'adding value' to raw minerals by processing them into, or close to their finished state – a process

sometimes known as downstream 'beneficiation'⁴¹. Beneficiation is already well entrenched in Zambia, thanks to the country's established smelting and refining capacity. Furthermore, a new state-of-the-art smelter was built at Kansanshi last year – the first of its kind in North-Western Province.

But, pursuing downstream beneficiation right through to the finished article does not at present look like the solution for Zambia. As Ross Harvey, a development economist from the South African Institute of International Affairs explains: "It's not desirable to add value to minerals in all cases. You have to think very strategically, focus on your competitive advantage and see where on the value chain it makes sense to be³⁵."

Chile, the world's largest copper producer, is a case in point. "Despite controlling one-third of global copper production, Chile does not engage in significant downstream beneficiation and processing – China has already captured the efficient means to do so," says a 2017 paper, *A roundtable on opportunities in the mineral sector between Chile and Africa*.

This point is echoed by the Africa Mining Vision (AMV), a roadmap formulated by African nations to show how mining can drive the continent's development, which recommends that countries focus instead

on upstream and sidestream linkages, because that's where the greatest economic returns lie⁴³.

Manufacturing opportunities

The presence of three massive mines in North-Western Province, spending millions of dollars a day in operational expenditure, is a massive boon to local supplier businesses; however, there are realities that must be accepted.

Zambia does not have a large, technologically advanced manufacturing base capable of producing much of the high-end machinery, parts and equipment used by the mines. Consequently, these must be imported. Instead, Zambia could focus on establishing manufacturing capacity in areas where it can demonstrate competitive advantage.

You have to think very strategically and focus on your competitive advantage

Quite apart from high-tech machinery, Zambia's mines have a continuous need for cables, wiring, piping and the many thousands of other inputs that keep operations going. For such items, mines would always buy locally, assuming parity of product quality, as the cost should always be cheaper (without transport costs and import duties). ZAMEFA⁴⁴ is just one example of a Zambian company that excels in this field.

It is not the only one. As previously mentioned, a \$40-million manufacturing facility is nearing completion in Kalumbila

and is scheduled to start operating in 2018. It will produce high-quality mill-balls for mines in Zambia, neighbouring countries and the world market. Mill-balls are used by mines in the crushing of ore, and is a major consumable. The plant is an investment spearheaded by Chile's M.E. Elecmetal⁴⁵, one of the world's leading mine suppliers, and is a classic example of an upstream linkage based on a sound business case.

Competitiveness challenges

But, Zambian supplier companies do face considerable challenges that prevent them from exploiting these competitive advantages.

According to the International Council on Mining and Metals (ICMM), these challenges include foreign exchange regulations, high costs of credit (30-40%), a limited supply of skilled labour, high power costs, and high corporate tax rates compared to neighbouring countries like Botswana, Namibia and South Africa⁴⁶.

Encouraging the development of a sustainable, long-lasting manufacturing sector means that these obstacles must be addressed. The mining-supply business is hugely competitive, and no one will invest in starting a new venture – or buy from it – unless there is a compelling business case to do so.

As Patrice Motsepe, executive chairman of the South African mining company African Rainbow Minerals, observes in a study⁴⁷ on African beneficiation: "We have for many years – not just in South Africa but in many parts of the continent – spoken about beneficiation. I think part of the secret is you have got to make it attractive [and] profitable for the private sector – and it will take off."



KNOWLEDGE IS POWER. A teacher at one of the schools in the Solwezi area supported by Kansanshi Mine

Conclusion

The province's development contains lessons for Zambia

Confirming the obvious

Many people in Zambia measure mining's contribution to economic and social well-being by the sole yardstick of taxation and royalties. What this report shows, however, is that there is much more to this contribution than meets the eye, and that the true picture is much bigger.

An aid to policy-making

Taken in the right spirit, a report of this sort can be a useful aid for Zambia's policy-makers in trying to understand the link between investment and economic development, and how to deal with both its successes and challenges.

This report could be the foundation for a more exhaustive and analytical study, perhaps by a well-resourced institution such as the World Bank. It would critically analyse everything from population growth and indicators of economic well-being to employment, business creation and spending patterns.

The last detailed study of mining development in North-Western Province can be found in the 2014 report, *Enhancing mining's contribution to the Zambian economy and society*⁴⁸, by the ICMM. That study's statistical findings are squarely in line with the more anecdotal findings of this short report – for example, it notes the rapid rises in population and urbanisation in the province, as well as the dramatic improvements in incomes, employment and poverty reduction.

Unfortunately, the end-point was 2010, which means the study is now considerably out of date. It fails to account for the billions of dollars of additional mining investment and economic growth that the province has seen since then.

The definitive account of the North-Western Province economic miracle has therefore yet to be written.



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