



1: L-R John Chikokoto, Deborah Craig, Hellen Chasowa, Andrea Antonucci. Photo credit Deborah Craig.

Can gemstones bring prosperity to Malawi?

Deborah Craig FGA DGA, head of the Africa Team at International Women in Mining (IWIM) and board member within the organisation, reports on her recent trip to Malawi.

Peaceful, democratic Malawi remains one of Africa's least-developed countries. Yet this small landlocked place, affectionately known as 'The Warm Heart of Africa', sits within the Mozambique Belt, surrounded by its famous gemstone-producing neighbours: Tanzania, Zambia and Mozambique. What is Malawi's potential to join their ranks as a source of some of the world's most beautiful coloured gemstones? Can Malawi's nascent gemstone industry create prosperity for the country?

In autumn 2016, Andrea Antonucci FGA and I travelled to Malawi to visit the Chimwadzulu Hill sapphire and ruby mine and meet with members of the local gemstone community. We began in Blantyre with John Chikokoto (1), the president of the Gemstone Association of Malawi (GAM). GAM was re-energised in 2015 with funding from the World Bank's 'Mining Governance and Growth Support Project'.

Mr Chikokoto brought ruby and tourmaline crystals to show us (2). GAM members are mining sapphire,

ruby, aquamarine, rhodolite, zircon and blue agate. There is even a rumour that kimberlite has been discovered near the Mozambique border, but much of what we hear is merely speculation. The bulk of rough material is immediately exported out of Malawi, often illegally. Unlike Tanzania, Zambia and Mozambique, Malawi does not have a value-addition strategy, which would ensure more gemstones were processed in-country. He tells us if the gemstone industry is to grow, develop and provide long lasting economic benefits, his

members need skills training at all stages of the value chain — mining, valuation, lapidary and marketing.

These sentiments are echoed by Hellen Chasowa, regional chairperson south for Malawi's Women in Mining Association (MAWIMA). GAM has around 2,000 members, of whom approximately 800 are women and also members of MAWIMA. Attracted to gemstone mining and dealing as an alternative to subsistence agriculture, which occupies most Malawians, MAWIMA's members would also like to add value to the stones they are mining to increase their incomes and develop sustainable livelihoods. They are seeking project sponsorship for a tumbling machine and a drill, to make beads and create jewellery for Malawi's burgeoning tourist trade.

Two companies, Nyala Mines Ltd and Columbia Gem House are working hand-in-hand to bring Malawi's gemstones to the attention of the world market. Nyala Mines Ltd mines sapphire and ruby at Chimwadzulu Hill, and has created a fully-integrated, transparent supply chain extending from mine to retailer with its cutting, marketing and sales partner, Columbia Gem House.



2: Ruby, from a new discovery at Makanjira, glow in the afternoon sunshine. Photo credit Deborah Craig.

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They would like the Nyala brand to equal quality, trust (disclosure of treatments) and social responsibility. The last is of critical importance when engaging with the economically disadvantaged communities close to the mine. Nyala works together with community leaders to understand how best to provide local support. To date, Nyala has built new school blocks (3), constructed boreholes for wells and upgraded the local health clinic.

Chimwadzulu Hill (4) is an eluvial corundum deposit discovered in 1958 about 145 miles south of Lilongwe, Malawi's capital. The heavy minerals have been eroded by in-situ weathering and scattered down the sides of the hill, like sprinkles on top of an ice cream cone. The presence of both chromium and iron mean that corundum is found here in a rainbow of colours: pale green, blue and yellow sapphires (5), but rubies and padparadscha sapphires are also found here.



3: A warm welcome at the Kandoma school. Photo credit Andrea Antonucci.

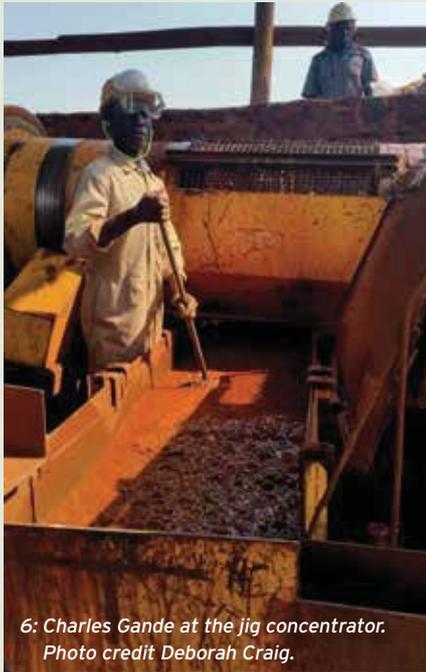


4: View from Chimwadzulu Hill. Photo credit Deborah Craig.



5: A beautiful 4.71 ct blue sapphire from the deposit, now in the Smithsonian Gem Gallery. Photo courtesy of Columbia Gem House.

Mining at Chimwadzulu Hill



6: Charles Gande at the jig concentrator.
Photo credit Deborah Craig.

The Chimwadzulu Hill operation begins with front-end loaders excavating the corundum-bearing ore within a 2 km mining area. The ore is then fed into the diesel-powered processing plant with water pumped from the local river. A trammel screen separates and discards larger pieces of rock. The smaller pieces of rock and water continue their onward journey to a jig concentrator, which shakes back and forth. This separates out the heavy minerals, which fall into a collection tray (6). When full, the collection tray is removed and its contents are deposited onto a sorting

table (7), where the experienced sorters identify corundum by its extraordinary lustre (8). Thus begins the complex sorting and grading of the corundum to maximise the value obtained.

The first step is 'first sorting' or 'mine sorting' the corundum into 'industrial' and 'gem quality' at the mine site. The majority of the corundum is heavily included and used as industrial corundum, although some of this material can be used for heat treatment testing, lapidary training or depending on the colour, inexpensive beads. The less included gem-quality material is separated by clarity into two colour categories: 'red/pink' or 'other'. As most of the larger pieces of rough will be broken down, size is not that important.

The gem quality material is shipped to Columbia Gem House, where it is washed with hydrofluoric acid and submitted to 'second sorting' by colour and specific types of inclusions. For each batch of poor colour rough that will be heat treated, an optimal process is developed. Only one level of traditional heat treatment is used and no elements are added. Clarity enhancement is typically unnecessary, because when the corundum formed at Chimwadzulu Hill, the titanium never formed rutile. Gemstones in a range of 16 different colours, with up to three clarity grades, can ultimately be obtained.

The untreated and treated rough is then sent to a sample cutter in China, who balances beauty of the stone with weight retention, always mindful of market demand. Nyala brand sapphires and rubies are marketed by Columbia Gem House in the USA, Canada and Europe, where the stones are valued not only for their attractiveness, but for their ethical pedigree — an increasingly important consideration for consumers.

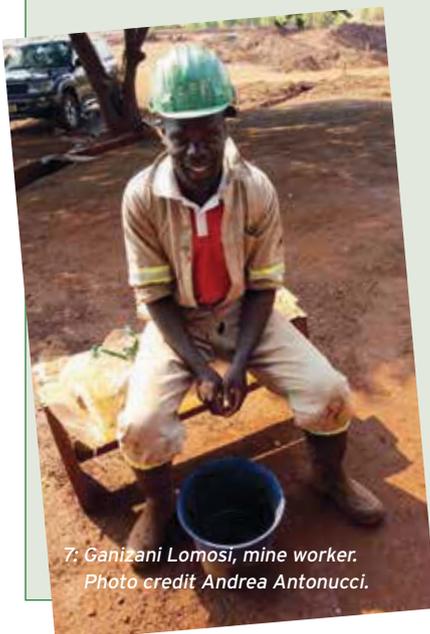
Over the years, the government, as well as various investors, have mined the deposit with varying degrees of success. In 2008, Nyala Mines Ltd acquired Chimwadzulu Hill, but the financial crisis, combined with rampant theft and high operating costs forced the mine to close. In 2013, Malawian national Abdul Mahomed acquired 80% of Nyala Mines Ltd bringing new life to the mine. Columbia Gem House, which had partnered with previous owners, reaffirmed their commitment to cut and market the stones.

Chimwadzulu Hill is primarily a low-grade (in terms of carats per tonne) sapphire deposit; the rubies and padparadschas are a welcome bonus. The key to ensuring the mine's profitability is to increase the volume of ore excavated and processed, thereby bringing down the mine's operating cost per tonne. The current plant processes 30 tonnes of ore per day. Mr Mahomed would like to increase production significantly to 1,000 tonnes of ore per day. The new plant and equipment has been ordered and an environmental impact assessment has been filed, pending government approval. An increase in production will also hasten the removal of the overlying secondary deposits, hopefully exposing the primary source of corundum that Mr Mahomed believes lies below.

It is time for Malawian gemstones to take their rightful place among the most beautiful gemstones in the world, while providing economic opportunity to Malawians. For this to happen, it is critical that the Malawian government implements value-addition strategies that ensure more rough material stays in-country to be cut and fashioned. There will be challenges, but small steps in skills training and market development can be taken at the local

level, through associations such as GAM and MAWIMA, supported by Malawian and international partners. Nyala and Columbia Gem House have shown that operating in an ethical manner creates important benefits for local communities, as well as making good business sense. ■

Deborah Craig would like to acknowledge the financial contribution of the Swedish Gemmological Society who helped make the trip possible.



7: Ganizani Lomosi, mine worker.
Photo credit Andrea Antonucci.



8: Corundum, identifiable by its lustre.
Photo credit Deborah Craig.