THE EMPOWERMENT OF TANZANIAN WOMEN THROUGH JEWELLERY MANUFACTURE

Developing a coloured gemstone jewellery manufacturing enterprise that empowers Tanzanian women, and incorporates the values of traceability, transparency and fair trade.

The following report forms "Part A – Preliminary Study" in accordance with the engagement of Cerulean Corporate AB by the Geological Survey of Sweden (SGU) on July 11, 2014. The report has been prepared by Deborah Craig and Andrea Antonucci and submitted to the SGU on August 28, 2014; it provides desktop research on the coloured gemstone industry in the Southern Africa Development Community (SADC), with a focus on Tanzania, in support of the development of a self-sustaining women's jewellery manufacturing enterprise. The information included in the report is from existing reports from governments, companies and non-governmental organisations (NGOs) and other publically available sources; all amounts are in USD unless otherwise indicated.

SECTION ONE: Overview of the coloured gemstone industry (vs. diamond industry) within SADC

Our report will focus on coloured gemstones, and will exclude diamonds. The most economically important coloured gemstones are the corundum varieties ruby and sapphire, emeralds and in the African context, tanzanite; other gemstones of interest are aquamarine, tourmaline, garnet (including tsavorite), and amethyst.

Coloured Gemstone Mining vs. Diamond Mining

It is important to consider the differences between the diamond and coloured stone industries. Diamonds are mined from either volcanic bodies of kimberlite or similar rock, or from river and beach gravels where they have accumulated after erosion from primary source rocks. Diamonds are valuable regardless of quality or size. The majority of diamonds mined are not of gem quality, but can be used in a wide variety of industrial applications. Reliable resource estimates can be made from diamond deposits. Therefore diamonds are explored and mined on a much larger scale, and in a far more systematic, mechanized way than any other gem material, typically by large mining companies.

Most coloured gemstone deposits are small and are found in remote, inhospitable terrain; the deposits, whether in parent rock or in placers, are patchy and unpredictable, making reliable resource calculations difficult. As opposed to diamonds, not all coloured gemstones have properties that make them economically valuable; only stones of gem quality have economic value and are mined. This combination of factors makes large-scale and highly mechanised mining of such deposits uneconomic, and the majority of coloured gemstones (estimates range from 80 to 90%) are mined in low-cost, widely dispersed artisanal and small-scale mines. Gemstone deposits in parent rock or in consolidated gravels are mined by hard physical labour with picks and drills. Unconsolidated gravels are the most abundant and easiest deposits to mine; they are often found along dried-up riverbeds and up to 20 metres below surface. To access the gem gravels near the surface, open pits are dug; for those deeply buried, a shaft is dug, typically with horizontal tunnels or galleries.

Artisanal mining is the most rudimentary type of manual mining; small-scale mining is more organised and includes the use of machinery. Both artisanal and small scale mining are characterised by:

- lack of geological, gemmological and market knowledge
- a lack legal rights to the properties
- limited access to capital for development
- inefficient markets for products
- intensive labour for low rates of recovery
- sub-optimal health and safety conditions
- poor environmental practices, including the encroachment on protected areas
- in some cases, the use of child labour

However, artisanal and small-scale mining also performs an important economic function. There are an estimated 20 million artisanal and small-scale miners working

worldwide; they, in turn, provide support to an estimated 100 million people via family support and related economic activity, and hence have a significant economic impact. It is estimated that 100,000+ artisanal and small-scale miners work in coloured gemstone mining (UNICRI, 2013). It is important to engage with this sector and work toward legitimization and capacity building; unfortunately constructive engagement with artisanal and small-scale miners, while necessary, is sometimes seen as legitimizing an illegal activity.

Also, as opposed to diamonds, gemstones are mined in more than 50 countries; the multitude of sources means a multitude of geological, political, legal and economic contexts that shape local gemstone industries. The coloured gemstone industry is a strategic industry in many African and Asian countries. However, a closer look reveals that the production and processing of coloured gemstones comes with a range of serious economic (ex. unfair trade, smuggling), social (ex. health and safety issues, low and insecure income, child labour) and environmental (ex. deforestation, loss of biodiversity) issues. Initiatives to counteract these issues are gaining momentum, but the opacity of the supply chain presents problems.

Coloured Gemstone Production – Worldwide and Africa

Global Coloured Gemstone Production

Globally, the value of gemstone production excluding diamonds was estimated to be more than $2.5 billion in 2011 (USGS, 2012). Global demand for coloured gemstones focuses on cut sapphire, emerald, tanzanite and ruby. The global retail market value of coloured gemstone jewellery was estimated to be worth US$10 billion-15 billion in 2007. Rubies and sapphires were 35% of that total, tanzanite was 10-15% and emeralds were 10-12% (SOMO, 2010). To give a sense of scale of the coloured stone industry compared to the diamond industry, in 2012, rough diamond revenues were $14.8 billion, and retail sales of diamond jewellery were $72.1 billion (Bain&Co, 2013) – so the value of the diamond industry is approximately 7x greater in size.

Africa, key producing regions

The Neoproterozoic Mozambique Belt is a geological formation that extends through East Africa from Kenya to Tanzania, Mozambique and to the island of Madagascar; it is thought to host the world's richest unexploited deposits of coloured gemstones. Gem varieties that have been found there include sapphire, ruby, emerald, spinel, tanzanite, alexandrite, tourmaline, zircon, aquamarine, tsavorite, spessartite, rhodolite and demantoid garnet.

In their rough form, non-diamond gemstones represent only a fraction of the trade in mineral commodities produced and exported from African countries. Calculating the trade in coloured gemstones from Africa is extremely difficult. Estimates suggest that the majority of all trade in gemstones from African countries is undocumented, and takes place in the informal, unregulated or illicit economy outside of state control; in the case of Madagascar and Zambia, it is thought that the majority of the stones leave the country unofficially (SOMO, 2010). Furthermore there is a lack of reliable data, or the data is often merged together with the data for diamonds.

In lieu of reliable production data, and keeping in mind the large degree that stones are exported illegally, we can get some sense of importance from official export statistics. According to UN Comtrade data, as compiled by SOMO, the top five exporters of precious stones from Africa in 2007 were Tanzania, South Africa, Zambia, Madagascar and Kenya. These five countries together represent roughly 99% of total official African exports of coloured gemstones by value. It is important to note that the majority of South African exports are "re-exports", i.e. the stones have been imported and then re-exported, perhaps after being fashioned to some degree.

Table 1: Africa's five leading exporters of coloured gemstones in 2007 (in USD millions)	2007
Top African Exporters	
Tanzania	44,7
South Africa	44,6
Zambia	37,6
Madagascar	16,9
Kenya	5,5
Other African countries	2,2
Total Africa	151,5
source: SOMO, 2010, based on UN Comtrade	

The following are the important gemstones being produced by these top exporting countries:

Table 2: Top African producers and key gemstones

Tanzania	tanzanite (world's only producer), emerald, ruby, alexandrite, sapphire, spinel, garnet, chrysoberyl, tourmaline
South Africa	emerald and amethyst
Zambia	emerald (world's 3 largest producer), amethyst, tourmaline, aquamarine, citrine, and garnet
Madagascar	beryl,rose quartz, sapphire, tourmaline
Kenya	beryl, tsavorite garnet, sapphire

According to data from UN Comtrade, compiled by SOMO, Africa's top export partners are India, South Africa, the USA, China & Hong Kong and Thailand.

Table 3: Top 5 destination countries for African coloured gemstones in 2007 (in USD millions)	2007
Top African Export Partners	
India	75,5
South Africa	21,0
USA	13,2
China, Hong Kong	13,1
Thailand	8,6
Other partners	20,3
Total Africa	151,7
source: SOMO, 2010, based on UN Comtrade	

Each of Africa's top producers may have different trading relationships with the top export partners. For example, India remains the major destination for coloured gemstones from Kenya, South Africa and Zambia, while Madagascar's exports are largely destined for Thailand and Hong Kong. In order to keep more of the value added in-country, both Madagascar and Tanzania (refer Tanzania later in this report) have implemented export bans on rough material with limited success.

Fluctuations in the global market for coloured gemstones have a clear impact on African producers. Increased demand in the new consumer economies of China and India has important implications for the balance of trade and investment with African countries.

What does the mine to market chain look like for coloured gemstones?

The coloured gemstone industry – exploration, mining, processing, and distribution - is very fragmented and complex and opaque, with many individuals and small companies bound together in intricate trading relationships. A rough gemstone may be sold and resold many times between different layers of intermediaries and traders before it reaches the final consumer making it nearly impossible to trace a gemstone's trajectory from the mine to the end-user (Graduate Institute of Geneva, 2013). Unlike the diamond industry, there is no entity that controls more than 2% of the market, by volume or value of shipments (SOMO, 2010). The only two large integrated players of note in the industry are Gemfields Resources PLC which mines, processes and markets emeralds and rubies from Zambia, and TanzaniteOne Ltd., which mines, processes and markets tanzanite from Tanzania.

The mine to market chain involves the following steps:

<u>Step One - Mining</u>
The majority of coloured gemstones (80-90%) are mined by an estimated 100,000+ artisanal and small-scale miners in 50+ countries, working legally and illegally; the remaining production is from large vertically-integrated companies (10-20%). These ratios vary by gemstone and mining district.

<u>Step Two – Local trading</u>
Local (mine site) petty traders buy the rough material and sell to mineral brokers, who sell onward in larger trading centres to mineral/gemstone dealers who trade internationally. The majority of brokers and dealers, who may be local or foreign, are not licenced and their activities are undocumented and there is a great deal of secrecy surrounding their connections and activities; this is the least transparent aspect of the supply chain. Research indicates that the majority of gemstones produced by artisanal and small-scale miners in Africa are exported illegally. (SOMO, 2010)

Initiatives to institutionalise the trade in gemstones through state regulated trading or marketing systems have proven unsuccessful. For example, the government of Zambia has made several attempts since the 1980s to centralise and control the trade in gemstones. These efforts have been unsuccessful as artisanal and small-scale miners bypassed state trading agents and sold their best stones at higher prices to dealers operating illegally. (SOMO, 2010)

The mining of coloured gemstones by large companies is more formalised and there is a shortened supply chain. The company will have direct contracts with cutters and polishers, manufacturers and retailers, or alternatively, they have integrated these functions into their own business. The rough material is sold in packages at bourses and auctions, possibly to sightholders (authorized bulk purchasers of rough stones).

Step Three - Sorting

Mineral/gemstone dealers cleave, saw and sort the rough material and sell to cutting, polishing or jewellery manufacturing enterprises, or in the case of high value material, the rough is sold via bourses and auctions. The complexity of these networks and the number of actors involved - including business entrepreneurs from India, China, the US, Western Europe, and the Arab Emirates - mean that it is enormously difficult to gain a clear picture of the trade in rough, unprocessed gemstones.

Step Four – Cutting & Polishing

Lapidarians (people involved in the cutting and polishing of gemstones) commonly purchase consignments of coloured gemstones from mineral dealers. Workshops and factories cut & polish the rough material and sell further to gemstone wholesalers. The global gemstone cutting and polishing industry is dominated by the cutting hubs in Thailand and India, which are important to their respective economies.

The traditional cutting centre in Thailand was Chanthaburi, because of its proximity to a gemstone mining district, but the mines are now exhausted and production has moved to cheaper sites in Thailand, including Isan and Bangkok. The industry is dominated by small producers who work at home or in small workshops. The Thai industry has been under pressure because of the US import ban on rubies from Myanmar (Burma), the majority of which are cut in Thailand. There is also a lack of confidence in Thai product after the failure to disclose treatments to enhance the stones. In addition, cheaper labour costs can be found in India.

Jaipur, India, which has lower labour costs than Thailand, is also characterised by small, fragmented, and unorganised workers, although there has recently been increased investment in larger manufacturing facilities, in order to produce international quality output.

Other important cutting centres are Hong Kong, Colombo Sri Lanka (important for sapphires), Tuscon, Arizona and more recently the UAE (Dubai), with Germany's (Idar-Oberstein) once central role declining. In terms of geographical trade flows, stones from South America – unless they are cut locally – tend to be exported to Tucson for cutting, stones originating in Central Asia are cut in Jaipur, and rough stones from Africa are mostly sent to Bangkok.

Step Five – Wholesale of cut stones

Gemstone wholesalers sell cut and polished gemstones to jewellery manufacturers. Dealers and wholesalers of non-diamond gemstones advertise widely on the internet. Trade fairs and auctions for the gemstone industry attract producers, importers and exporters from around the world. Major annual events include AGTA GemFair Tuscon, Arizona, and InterGem held in Idar-Oberstein, Germany.

Step Six – Jewellery production
Jewellery manufacturers (often involving sub-contractors) produce finished pieces of jewellery, often against specific orders from jewellery brands and retailers, and sell onward to jewellery wholesalers or retailers. Higher value items/luxury jewellery tend to be manufactured 'closer', organizationally and geographically, to the jewellery retailer than large quantities of commercial jewellery products.

Step Seven – Jewellery wholesale
Jewellery wholesalers sell onward into the retail system.

Step Eight – Jewellery retail
Luxury and commercial jewellery retailers (independent, chain stores, online) sell onward to the final consumer.

SECTION TWO: Supply Chain Transparency & Sustainability

There has been growing interest from within the industry, and pressure from external parties, to increase traceability of coloured gemstones and the transparency of the coloured gemstone supply chain. This was, in part, a result of the Kimberley Process (KP) for diamonds, which requires transparency regarding the country of origin of rough diamonds, in an attempt to stem the trade in so called "conflict diamonds". Because of the different dynamics of the coloured gemstone industry, in particular the greater number of small-scale miners and producing countries, the KP process would be difficult to apply. But greater attention has now been drawn to the issues in supply chain transparency, and two initiatives follow:

The most promising initiative to date is the one formulated by the United Nations Interregional Crime and Justice Research Institute (UNICRI), Vienna international justice institute (VIJI), International Colored Gemstone Association (ICA). The goal is to establish a chain of custody mechanism focussing on traceability and origin certification, i.e. certifying where coloured gemstones come from and ensuring that they are ethically sourced; promoting socially and environmentally responsible practices; crime and fraud prevention; the authority and security of countries over their resources (increased royalties and taxes); branding opportunities for countries of origin; and value creation linked to ESG performance. This initiative is currently in the inception phase.

In addition, a working group called "Precious Stones Multi/Stakeholder Working Group (PSMSWG)" has been formed by industry, NGOs, and government representatives with the mandate to explore how to advance and coordinate responsible supply chains and sourcing in the jewellery sector. The working group was launched by numerous stakeholders at a meeting held at the Organisation for Economic Cooperation and Development (OECD) in Paris in April 2013. The group's members cover the entire value chain for precious stones. In a study commissioned by PSMSWG, conducted by the Graduate Institute of Geneva, the following were identified by the respondents as the most pressing problems in the coloured gemstone industry:

- Corruption
- Smuggling and fraud
- Working conditions and child labour
- Funding human rights abuses and violence

Problems on the ground

Artisanal mining engages very poor people who often have no other options to make a living; they may turn to mining at times of the year when cultivating the land is not possible. It is an unregulated activity, often illegal, in remote areas and the miners have very little knowledge in geology, gemmology, cutting, safety, international markets and pricing. Lack of proper equipment is standard. There are no guarantees for earning any money, often the miners only get paid if they find something. Child labour is common in some countries, including Tanzania, and fatal accidents occur. Work can take place in tunnels that go as deep as 300 meters and can collapse or be water filled. Children with small bodies enter narrow passages and might suffocate from the lack of oxygen. Inhalation of fine, crystalline silica dust, generated from breaking and crushing rock, can

result in silicosis. The use of explosives can lead to the inhalation of toxic air. Young girls become sex workers in the male-dominated, hierarchical environment of mining.

Since the main concern of artisanal miners is putting food on the table, there is no room for (or knowledge of) sustainability and environmental issues. Artisanal mining can destroy the land and pollute the water for centuries to come. Deforestation encourages flooding, which in turn increases the net area of standing water; this contributes to malaria and other mosquito-bearing diseases. Many artisanal mining sites are ad hoc and come and go in a very short period of time. The quick depletion of resources means that it is a nomadic activity that often leaves a scarred landscape behind as the miners move away in search of new findings. This limits the participation of women at mining sites as they are caretakers and less likely to leave the family.

Women are at the bottom of the hierarchy in this male-dominated industry and often do subordinate work. Large-scale mining operations rarely hire women which means they lack and seldom gain new experience, thus obstructing their involvement in small-scale mining. Almost no claim owners are women and it is more difficult for women to get loans for small-scale mining activities. Harassment and sexual abuse are common. "The inequality between men and women is great and women often work longer hours and with more dangerous tasks, for much less money than their male counterpart." (UBC, 2003)

The trading of gemstones is highly complex and often informal, involving a great number of actors such as miners, crushers, panners, sifters, rough dealers both at the mining site and in turn at gem centers, and cutters and dealers of the cut material. Mostly the deals are being done between familiar parties without any written papers, thus protecting sources.

Due to the scattered nature of the artisanal mining of coloured gemstones, and the political, geological, social and economic differences between the various countries, it is nearly impossible trying to implement universal regulations for artisanal and small-scale mining. The specific conditions of each country need to be considered instead.

Health problems for gemstone cutters include bad eyesight, back pain and silicosis, the so-called 'dust-lung disease', an incurable occupational ailment which afflicts workers through the inhalation of airborne crystalline silica dust, which progressively debilitates lung capacity.

Currently there are only a few known fair trade efforts on the market: FairTrade gold, www.rubyfair.com and TanzaniteOne in Tanzania, Columbia Gem House/"fair trade gems" in Malawi, and Gemfields in Zambia.

Why focus on women?

An estimated 70% of the world's 1.3 billion poor are women and girls (UNIFEM, 2000). On average, 30% of the world's artisanal miners are women, although this number varies by geographic region and is highest in Africa, where the number can reach 100% at certain mine sites. The number of women working in artisanal mining is increasing, due to increased rural poverty due to droughts, men leaving to seek employment at

large-scale mining sites or in urban areas; lack of other employment options; evolving gender roles wherein artisanal mining becomes acceptable for women; high fertility rates; and the need of women to support both their own families and those of relatives who have died from AIDS.

Women do labour-intensive work as panners and ore carriers (men tend to be the diggers); they also process the ore via washing, sieving, crushing and grinding (which can present a risk for silicosis). In gold mining women are often working with the amalgamation and amalgam decomposition of gold using mercury, often at their stoves, in their homes, posing a great risk to themselves and their families for mercury poisoning (in some cases, men are aware of the toxicity of mercury and consign women to this task). In addition to their direct input to mining activities, women also work at mine sites as cooks, shopkeepers and sex trade workers. Less commonly, women hold mining permits, are mine operators, dealers and traders and equipment owners. (UBC, 2003) In addition to silicosis and mercury poisoning, women are at risk due to poor physical conditions, such as ground failure, shaft collapses and machinery accidents; there are also incidences of violence towards women at mining camps – most often those camps that have been formed quickly due to a local discovery. "Living conditions for girls and women in these (mining) communities are usually on the boundary between poverty and misery" (Veiga, 1997 via UBC, 2003).

The participation of women in artisanal mining is greater than large-scale mining; they are also more involved in mining low-value industrial minerals than high-value precious metals. Of note however, women have a significant involvement in the gemstone mining sector in Tanzania. Usually, small-scale miners find it difficult to access loans from private finance institutions because of lack of trust and accountability in the sector. This especially applies for female miners. (MMSD, 2001)

Artisanal and small-scale mining is critically important for many poor communities, providing temporary or full-time work and offering potentially the only source of income. And evidence suggests that small-scale mining enterprises owned by women are generally better managed than those under male control. Artisanal mining has the potential to be an important catalyst for entrepreneurial activities, and the formation of strong, resilient communities, but progress will be severely limited until all stakeholders have the necessary tools to affect positive change and challenge existing inequities. Women can play a vital role in this transformation, in part, through the development of sustainable livelihoods. Providing women with access to information, credit, and training, combined with an amenable policy framework, are key steps to facilitating this change. (UBC, 2003) Factors that affect access to information include the availability of time, literacy, control over household media, access to written material, and the ability to travel (UCST, 1995). Connecting women with Non-Governmental Organizations (NGOs) and strengthening linkages between individuals or groups of women can markedly improve women's access to resources. Within a formal network or organization, women are better equipped to respond to negative impacts of artisanal mining and take advantage of opportunities in this sector (Wiego, 2002).

There have been government and NGO initiatives to encourage women to form co-operatives in order to educate members regarding their legal rights and safer and less laborious mining methods, and also increase member's suitability for credit. In addition,

efforts to develop the participation of women in value-added processes such as lapidary and jewellery making (as well as marketing, management and book-keeping) have been recognized as an important opportunity for women. Women's economic empowerment has been seen as key to poverty-alleviation as it has been established that women spend their income on improving the quality of life for their families, through education, food, and agriculture, whereas men are more inclined to spend their income on gambling, prostitution and alcohol.

Child labour

Child labour is an issue in the supply chain both at the artisanal mining level and at the Thai and Indian cutting and polishing hubs, where increased international demand for gemstones led to an increase in the employment of children less than 14 years old. Estimates from India in 1997 suggested that there were around 20,000 children among the 200,000 gem workers in Jaipur, and 10,000 children out of a workforce of 60,000 in Trichy, but recent, reliable data in not available (SOMO, 2010).

Challenges implementing fair trade principles (from interviews with Mike Angenent of The Jeweltree Foundation, Marc Choyt of Fair Jewellery Action, Eric Braunwart of Columbia Gem House)

Our three interviewees identified issues that can arise when establishing a transparent value chain based on the principles of fair trade:

1) Developing the capacity to implement standards and principles "on the ground"; finding the right local people who understand the scope and the efforts and the long term vision of what you are trying to accomplish; this requires education and funding;
2) Developing a consumer market that demands fair trade products;
3) It may be difficult to enter and change certain markets; for example import and export restrictions present difficulties; in the DRC, to obtain an export licence for diamonds can cost USD 250,000 per annum, and only about 10 companies have them; this makes it difficult for other actors to enter the market and make changes;
4) Often the host countries assume that they can add value by local polishing initiatives but in many cases it is far more interesting to just focus on the rough sales by tender/auction systems; local polishing is often heavy subsidized and creates jobs but rarely adds real value because of poor management; and
5) Strong individuals among the miners/partners can have a negative impact on a project because they try to run them for their own personal interest.

Eric Braunwart: I have been consulting on a large project in Madagascar, a small co-op project in Malawi, and then I have been very involved in the Nyala project in Malawi. I have also been approached by two miners in Mozambique and an emerald and silica mining project in South Africa. All are starving for funding. Most have very developed, competent people and marketing studies. The co-op projects are more "boots on the ground" village mining projects, but need a central coordinating, equipment and storage

structure. …. I do know it is an immense amount of work to put something like this together in Africa but, at least in some cases, they are pretty well developed.

Infrastructure: To illustrate, I will briefly mention a World Bank project I worked on to set up volume cutting in Madagascar. My initial report stated, "There are so many infrastructure problems here that I must first detail those or it is impossible to detail how to develop a cutting industry." The answer came back, "We have budgeted USD 40 million to set up cutting, it must be spent, and it must be spent on cutting." Well, my answer was, "I guess we can do that, but I will guarantee it will fail as an ongoing financial or business enterprise, if the infrastructure problems are not met first or at least are an integral part of the plan."

Business: The problem is, that without developing the business end at the same time, the project fails. No consumer needs gems and jewellery to live, so if the demand creation is not part of the development process then the likelihood of success is very small.
I must make sure that every penny results in the strong possibility of not just responsible production, but of actual product demand in the consuming world, so that the result is increased, sustainable income resulting in poverty alleviation.

Mike Angenent: Lots of the artisanal mining sites are ad hoc and come and go in a short period of time. The people working the fields are often looking to make an extra bit of money and are doing their work without any legal status whatsoever. Train and encourage some of the local buyers and formalize them so that they can step up as soon as a site is uncovered. Audit and approve certain buyers of gems who have a proven track record.

Marc Choyt: It is very difficult to be assured that the miners do not act as middlemen and try to buy additional gems to sell at a premium.

What do Swedish Jewellers say about sustainability issues?

Of the ten small companies contacted eight answered. All are interested in the ethical aspects of the business but have very little knowledge of the supply chain. A small majority puts ”fair trade” as the most important factor when buying gemstones, while the remaining group puts quality and price first. Coloured gemstones are not a commodity like gold and diamonds, and have no universal quality system. The mine to market chain varies greatly and coloured gemstones are often sold when both buyer and seller are present.

They are hesitant to buy loose gemstones through a webshop, due to quality issues and the previously mentioned fact that coloured gemstones lack a universal quality system (for example, there are many shades of green).

There was limited interest from the Swedish jewellers to have their jewellery made in Tanzania. There are two main categories of companies: smaller companies with one or two employees that usually don’t sell lines of jewellery. Rather they are craftsmen themselves, making one piece at a time. Some might be interested in helping to sell the Tanzanian jewellery though for solidarity reasons. The larger/luxury segment of the

jewellery business sell brands and high quality pieces so needs consistency in quality (regarding both material and cut) and quantity to satisfy their customers (and mass production to keep down prices).

All respondents but one were interested in finding ways to collaborate/exchange ideas with us, and visit the Project. All respondents believe it is an advantage being able to offer ethically sourced gems to their customers.

Vivien Johnston, Ethics Manager at The Gemmological Association of Great Britain and founder of Fifi Bijoux (an ethical jewellery company based in the UK) also believes that the ethical movement is driven by the small jeweller. The fashion industry has proven to be a good collaborator with the efforts of small ethical jewellers to advance supply chain transparency. The consumer demand for ”clean clothes” is an important ”force for change”; a similar demand for “clean jewellery” has not yet been seen in the jewellery segment.

Iduna and the two larger Swedish jewellery companies were contacted, but have not answered our questions. We believe that our questions were either uncomfortable for them, as they have not begun to address these issues, or they may have felt protective of revealing how they source their materials for competitive reasons.

SECTION 3: The Coloured Gemstone Industry in Tanzania

In addition to diamonds, Tanzania produces a variety of gemstones that include amethyst, aquamarine, cordierite, emerald, garnet (including tsavorite), ruby, sapphire, spinel, tanzanite (and other varieties of zoisite), tourmaline and zircon, for which production statistics follow. Other gemstones produced include chrysoberyl, chrysophase, moonstone, obsidian, opal, peridot, scapolite, topaz and turquoise.

Tanzania has one of the highest numbers of women working in artisanal mining in Africa; as of 2001 this number was 160,685, or 25% of all artisanal miners. Of note, gemstone mining is one of the most important sectors for women with more than half (74,296) working in that segment (Dreschler, 2001 via UBC, 2003). One women's organisation involved with women artisanal miners is the Tanzania Women Miners Association "TAWOMA". TAWOMA was established about 15 years ago, and includes women working in different capacities within the artisanal mining industry – for example, as miners, gem cutters, cooks, claim holders, brokers. The association currently has 400+ members.

Table 4 Tanzania: Coloured Gemstone Production in kilograms	2007	2008	2009	2010	2011	2012
Alexandrite	NA	15	1	---	---	---
Amethyst	270	200	150	160	160	160
Aquamarine	280	323	468	466	470	470
Emerald	NA	11	19	---	---	---
Garnet	5 900	4 400	8 448	9 934	10 000	10 000
Ruby	2 700	2 000	1 500	1 600	1 600	1 600
Sapphire	1 300	1 000	750	800	800	800
Tanzanite	NA	670	768	2 001	823	759
Tourmaline	NA	3 865	9 283	9 530	9 600	9 600

Other gemstones produced include chrysoprase, corderite (iolite), kyanite, moonstone, opal, peridot, quartz, spinel and zircon
These figures do not include smuggled artisanal production.
(source USGS, 2012 Minerals Yearbook, Tanzania)

Special role of tanzanite

Tanzanite, a blue/purple variety of zoisite, accounts for the majority of the value of domestic coloured gemstone mining. Tanzanite is extremely rare (1,000x rarer than diamond) and to date has been discovered at only one location in the world - the Merelani Hills of northern Tanzania, where mining began in 1967. In 1990 the Tanzanian government split the tanzanite mines into four sections: Blocks A, B, C and D. Blocks A and C were awarded to large operators, while Blocks B and D were reserved for the local miners. In 2005 the government renewed the lease of Block C mine to TanzaniteOne; a 2010 law required TanzaniteOne to cede 50% ownership of their mining licence to the Tanzanian State Mining Company (Stamico). Kilimanjaro Mines Ltd. and Tanzanite Africa Ltd. operate medium-scale mines in Block A and the Block D Extension, respectively.

Large-scale mining of tanzanite: TanzaniteOne

Richland Resources Ltd., via its subsidiary company TanzaniteOne, mines tanzanite in Block C. In 2012 the company completed a new lapidary factory at Merelani in response to the government's export restriction on rough stones larger than 1 gram (5 carats); the factory has sufficient capacity to process all the company's production. TanzaniteOne

has thus become a vertically integrated producer – mining, processing and branding its stones. In addition the company purchases rough material from local artisanal miners and traders, thereby controlling 35% of tanzanite production: 25% from its own operations, 10% from purchases. The company holds tanzanite sights six times per year, for six to eight handpicked businesses.

Artisanal mining of tanzanite

Thousands of people from all over Tanzania travel to the Merelani Hills each year to participate in the artisanal mining of tanzanite. The issues concerning the artisanal mining of gemstones are applicable to tanzanite mining as well; the miners use rudimentary equipment, lowering themselves by rope into shafts that can be 300 metres deep. Collapsing mines, floods and carbon monoxide suffocation (because of dynamite use) have caused hundreds of deaths in the past 20 years. As well, there is child labour on small or marginal deposits where the use of machinery is not viable; children are used to slip through small holes and tunnels; they also pan for stones, transport rubble, sort and crush stone and act as brokers. The work is unskilled and badly paid which encourages the recruitment of children. In recent years, artisanal tanzanite mining has declined. Sharp decreases in tanzanite prices resulting from the world economic crisis rendered most artisanal and small-scale mining operations sub-economic, and as of 2012 tanzanite production from artisanal mining had continued to decrease.

What is the legal and regulatory framework that governs the mining, and exporting of coloured gemstones in Tanzania?

The exploration, mining and export of coloured gemstones is governed by The Mining Act of 2010 (”the Act”) as follows:

Gemstone Prospecting Licences

Informal prospecting of gemstones is covered under Primary Mining Licences (below). With respect to the formal exploration of coloured gemstones, a ”gemstone prospecting licence” is granted for one year, renewable for an additional 3, then an additional 2, then another additional 2 for a feasibility study, given sufficient financial and technical capability, prescribed expenditures, and excludes kimberlitic diamonds.

Mining Licences

Under the Act, three types of mining licences pertaining to coloured gemstones can be granted:

- a ”primary mining licence” for artisanal and small scale operations, where the capital investment is less than US$100,000; primary mining licences are granted to Tanzanians only and gives the licence holder the right to prospect for and mine minerals for 7 years, and the licence is renewable. The licence holder may also sell any minerals recovered, subject to the payment of royalties.
- a ”mining licence” for medium scale operations is granted only to Tanzanian citizens, except in special cases, in which case the non-citizen cannot hold more than a 50% interest. The capital requirements are greater than US$100,000 and less than US$100,000,000.
- a ”special mining licence” for large scale operations, where the capital investment is greater than US$100,000,000. These may be held by non-Tanzanians on the condition that participation with the Tanzanian state is negotiated.

Trading

A Dealer Licence enables the holder to buy, sell and export the minerals specifically named in the licence. To obtain a dealer licence the applicant must be a Tanzanian citizen; non-Tanzanians can only hold a 25% share in a licence. The applicant must indicate a capacity to undertake lapidary. Dealer licences are valid for 12 months, and expire on June 30th; they are renewable if quarterly accounts have been submitted and minimum turnover requirements have been reached.

A Broker Licence enables the holder to buy gemstones from an authorized miner and sell to an authorized dealer, but does not allow the holder to export gemstones. Non-Tanzanians cannot hold broker licences; there is no requirement regarding lapidary. Broker licences are valid for 12 months and expire June 30th each year; the holder must keep accounts but there are no turnover requirements.

Royalties & Export

Only those persons holding a mining licence or a dealer licence can export gemstones, and only after the royalty or payment in lieu of royalty, respectively, has been paid and an export permit has been obtained. The royalty for mined gemstones is 5% of gross value and is 1% of gross value for cut & polished gems. The export of tanzanite requires a special export permit with an accompanying certificate of origin. Non-residents require a special export permit for minerals from the Commissioner of Minerals, although there are lower fees for tourists exporting minerals of a lower value.

Export Restrictions; Tanzania Gemological Center

As with other African countries, Tanzania is looking to capture more of the "value-added" from the gemstone supply chain, by encouraging, and in the case of tanzanite legislating (see below), miners and mining companies to cut & polish gemstones in-country, rather than export the rough for processing elsewhere. The African gemstone industry has been identified as a vital export sector and the IMF, the World Bank and the WTO advocate policy reforms that support the development of the sector, with the goal that will be a driver of development in rural Africa, and lead to the construction of roads, telecommunications and a social infrastructure such as schools and health clinics (SOMO, 2010).

Prior to 2010, 95% of rough tanzanite was exported to the cutting hub of Jaipur, India (Times of India, 2013). The Mining Act of 2010 brought into force the requirement of Licenced Dealers to undertake lapidary, as well as a ban on the export of all rough tanzanite larger than one gram (5 carats), in an effort to spur the development of local processing facilities, thereby increasing the contribution of tanzanite mining to Tanzania's economy. In addition, the Tanzanian government established a dedicated Export Processing Zone in Arusha that it plans to develop into a large mining (Moreland, the centre of tanzanite mining is close by), cutting, jewellery manufacturing, and trading hub. The ban faced immediate criticism from many dealers who claimed to have none of the equipment required for cutting and polishing the stones; the ban also caused consternation in Jaipur where approximately 30,000 workers had been engaged in the cutting and polishing of tanzanite (Times of India, 2013). However, 4 years later, statistics show that the majority of rough tanzanite still finds its way to India as 99.5%

of tanzanite output weighs less than one gram (allAfrica, 2014), and there is anecdotal evidence that the illegal smuggling of tanzanite has increased as a direct result of the ban.

The Government of Tanzania, with funds from the World Bank, has launched two projects with the goal of developing Arusha into a gemstone processing hub: The Arusha Gem Fair, and the Arusha Gemological Center.

Arusha Gem Fair

In October 2013, the first Arusha Gem Fair (AGF) was held in Arusha, Tanzania. The event was sponsored by the Ministry of Energy and Minerals (MEM) and the Tanzania Mineral Dealers Association (TAMIDA) with funds from the World Bank. The goal of the event was to bring together gemstone and mineral producers from across the SADC with local and international buyers, as well as other industry players and government leaders, using the show as a platform for driving programs and initiatives which support beneficiation and value addition back to the source. Exhibitors are required to showcase their work in the community, with a focus on empowering women (the AGF launched a Scholarship Fund that goes toward scholarships for women to be educated in the trades of cutting, carving, jewellery making and gemology; by October 2014, fifteen to twenty women from various regions in Tanzania will be attending the Tanzania Gemological Center (see below) under the scholarship program). The show also includes short courses, seminars and panels, keynote speakers and mine tours. The AGF will be held November 18-20th this year. During the show, there is a temporary lifting of the export ban on tanzanite. Although the organisers of the AGF maintain that there were 250 buyers in attendance, a confidential source maintains that there were "only about 10 serious buyers" as prices were set too high, and that the show suffered from poor marketing.

Tanzania Gemological Center

The Tanzania Gemological Center is managed by Mr Mussa Shanyangi, with input from Charles Carmona, a US gemmologist. According to Carmona, the remodelling of the 1,000 m^2 school is nearing completion and should be ready by October. Equipment has been ordered, and administration and processes have been created. Sufficient security and internet connectivity are available. There will be classes in gemology, with the goal of providing a 4 month program to 15 students, 3 times per year. The hope is that going forward the Center can provide gem identification and certification services. There will also be classes in carving, gemstone cutting, and basic jewellery making. Carmona was recently in Thailand, Sri Lanka and India meeting with potential "trainers for the Center's trainers". Carmona estimates that the first students will be ready 9 months from now, but he expressed his concern that " they will drop off a cliff", i.e. there will be insufficient jobs available to absorb them when they graduate.

Other Processing Facilities in Arusha

A US$300,000 gemstone processing factory is being developed as a joint venture between Diamonds International and Signature Gems of Arusha; 30 Tanzanian women will be trained, and the facility will house 24 high-tech gemstone cutting and polishing machines. The goal is to cut and polish one thousand carats of tanzanite gemstone a day; this output will be used internally for jewellery manufacturing by Diamonds International. (allAfrican, 2013). The TanzaniteOne Lapidary Facility is one of the

region's largest and most advanced onsite faceting and polishing facilities; 25 Tanzanians have been trained in precision gemstone cutting. (Richland Resources).

SECTION FOUR: Conclusions & Recommendations

Our recommendation is to develop a coloured gemstone jewellery manufacturing enterprise in Arusha that empowers Tanzanian women by teaching entrepreneurial skills, while incorporating the values of traceability, transparency and fair trade.

Why?

1. The Empowerment of Women

Women have had a role in the Tanzanian gemstone industry for many years, working at artisanal mining camps, and more recently being trained as gemstone cutters and jewellery manufacturers. And yet they remain the most marginalised of those working in the sector. In addition Tanzanian women have limited access to capital, or experience building small businesses. The SGU/SIDA have a unique opportunity to participate in real change for women.

Our project will adopt a gender-sensitive approach that gives particular emphasis to the role of women, in order to give women more influence in their households and their communities. We envision bringing together the women of TAWOMA, plus women gemstone cutters, stone setters, and mould makers (graduates from the World Bank-funded Tanzania Gemological Center) and providing the next step in their development: training in jewellery design, manufacture, marketing, website design, sales, and administration, so that the project can also work as a incubator for additional small business enterprises. The venture would also provide a platform for additional information on health & safety, fair trade, security, human rights and HIV/AIDS.

2. The Time is Right

The goals of the Tanzanian government are to create a regulatory and business environment in which more of the "value-added" of the coloured gemstone industry stays in-country, and to encourage the participation of women in mining, including their training in the fields of lapidary and jewellery manufacture. Our project would support both these goals. The first students will be graduating next summer from the Tanzania Gemological Centre. The establishment of a jewellery manufacturing co-operative in Arusha would fit perfectly as a next step in the development of these students, as well as contribute to the realization of Arusha as a hub for the Tanzanian coloured gemstone industry. Sweden and Tanzania have a long history of co-operation and we are optimistic our project would be well received. The time is right also in terms of the jewellery industry and the end consumer – both groups demanding more transparent value chains and respect for the rights of workers.

3. Transparency, Traceability and Fair Trade

The coloured gemstone industry is fragmented and complex and opaque, with well-documented labour and health and safety and legal issues along the supply chain. Our project would offer a high degree of traceability and transparency, while ensuring that the principles of fair trade are being respected. Ideally the gemstones will be sourced through TAWOMA, who advise that they know where the gemstones come from

(although working conditions may be sub-optimal). The rough material will be sorted and cut by women working through our co-operative in facilities with appropriate health and safety standards, and they will be paid a competitive salary. We believe that we can set an example of how the value-added along the chain from mine to produced jewellery can and should support those workers involved in its production. The jewellery business is beginning to change from within and needs partners from which to source ethical stones and jewellery.

4. **The Business Is Economically Viable**

Our original idea to sell cut gemstones online, but after doing our research we believe that all the "pieces of the puzzle" are there to complete the full value-added chain, and make higher margin finished jewellery pieces. The gemstones will be sourced, cut and fashioned locally, with relative low labour costs, making the product competitive compared to jewellery with a less transparent value chain, that may travel through many more middlemen. The jewellery would be marketed to the local tourist industry in Arusha and/or exported to America and Europe, ensuring a significant margin. We have had considerable interest already from jewellers in Sweden who would like to participate somehow in the Project.

5. **Support from Swedish Partners**

Initial discussions with Swedish jewellers indicate some willingness to support the Project, both by purchasing jewellery for re-sale and also in the form of a skills exchange. We envision jewellery design that is tailored to the broader market outside Africa and so design input from Swedish jewellers would be invaluable for making a more marketable product; potential partners could also include Swedish jewellery making and design schools. We also believe that those fashion labels that are engaging in the issue of sustainability, such as H&M, should be approached as potential partners. We also believe the Project could attract media interest, including documentary filmmakers, if this was of benefit.

What's Next?

The next step is to move from the desktop research of "Part A: Preliminary Study" to "Part B: Identification of Potential Partners", which involves collecting more information "on the ground" in Tanzania. At the end of Part B of the Project there should be sufficient information so that a decision can be made whether to prepare a formal Project plan to include costs, staffing needs, and the structure of the venture (for instance, should the enterprise be a co-operative, or a series of micro-financed small ventures?).

<u>Part B includes:</u>

Attendance at Trade Show, November 18-20 www.arushagemshow.com The Arusha Gem Fair provides an excellent opportunity to meet many of the industry actors together at one time.

<u>Potential Meetings in Arusha and Dar Es Salaam:</u>

- TAWOMA
- Tanzania Mineral Dealers Association (TAMIDA)
- Improved Life Quality for All
- Ministry of Energy and Minerals www.mem.go.tz
- MTL Consulting Company Ltd (MTL), Tina Mwasha. MTL is the Tanzanian partner in the 'Fairtrade Gold in East Africa' programme. www.mtlconsulting-tz.com
- SIDA, Tanzania
- Tanzania Gemological Center – Charles Carmona & Mussa Shanyangi
- Society for Women Empowerment Education and Training (SWEET) Africa Foundation, Rosemary Olive Mbone Enie, CEO/President/Founder
- Dana Shore, US-based gemologist, linked to miners
- Microfinance Institutions
- Peter Brown, partner of the online fair trade platform www.rubyfair.com

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