MINISTRY OF INDUSTRIALISATION,
TRADE AND SME DEVELOPMENT

Growth Strategy for the Namibian Jewellery Industry and Coloured Gemstone and Associated Value Chains

Gemstones and Jewellery Products

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FOREWORD

The Industry Growth Programme is part of the ongoing efforts to reinforce Namibia's economic growth, to reduce income inequality and to increase employment for its citizens. This Industry Growth Strategy forms part of the support to selected manufacturing industries envisaged by the Growth at Home strategy, which promotes Namibia's competitive advantages and opportunities. This is envisaged through the Special Industrialisation Programme whose aim is to provide targeted support for value chain analyses and feasibility studies.

It is through the implementation of this and other strategies that the Ministry of Industrialisation, Trade and SME Development, in close cooperation with other line ministries, will support local value addition, upgrading and economic diversification. The efforts will help to structurally transform Namibia's economy favouring the most productive and efficient economic activities, and local industries will be provided with improved market access at home and abroad.

The Industry Growth Programme is an important element of the war against poverty and a further step on Namibia's path towards becoming a highly competitive, industrialised nation with sustainable economic growth as depicted in Vision 2030. As such, this strategy's implementation through 2020 is geared towards strengthening forward and backward linkages within the Namibian economy as envisaged in the Harambee Prosperity Plan.

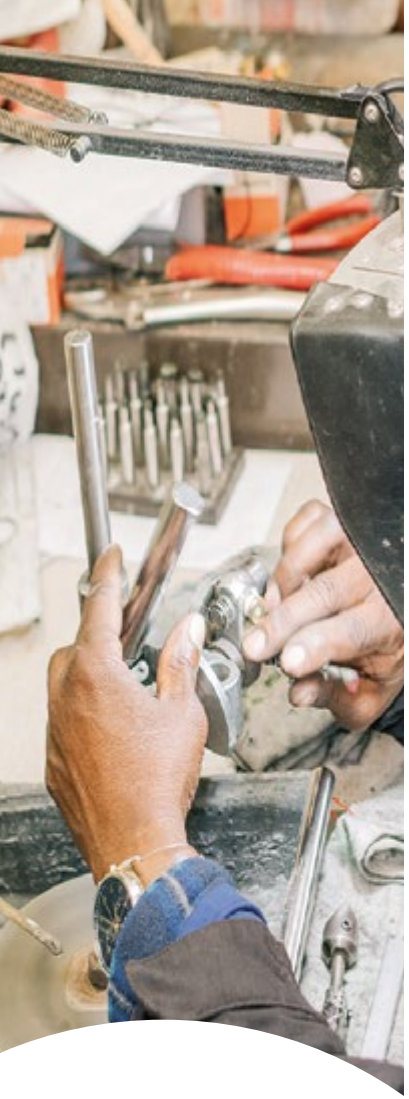
Jewellery and coloured gemstones are strategic industries that have, in agreement with the fourth National Development Plan, been selected for a more specific focus on its economic development. Key stakeholders from the business community and public administration who have a vested interest in the Namibian industry's prosperity for the benefit of all have engaged in extensive consultations and substantially contributed to this programme. They are now eager to implement interventions along the value chain effectively. Many of the suggestions and concerns raised by entrepreneurs and civil servants in extensive discussions have been distilled into this document. This interactive process has once more demonstrated that Namibians together can shape an enabling environment in which the manufacturing sector can thrive and the wellbeing of the Namibian people be advanced.

I am sure that the Industry Growth Strategies have the potential to remove challenges and accelerate economic development in the prioritised areas. The interventions planned for 2016 onwards will allow the targeted industries to prosper according to their inherent abilities. This strategy is a living document. As such, additional comments or remarks from stakeholders are welcome and can be addressed to the Ministry of Industrialisation, Trade and SME Development.

I am confident that, in the vein of the Harambee Prosperity Plan, all stakeholders involved will pull in the same direction in the upcoming implementation phase – as they have done in strategy building – for the advantage of a thriving Namibian economy that creates jobs, incomes and sustainable growth.

Hon. Immanuel Ngatjizeko
Minister of Industrialisation, Trade and SME Development

The Industry Growth Programme is an important element of the war against poverty and a further step on Namibia's path towards becoming a highly competitive, industrialised nation with sustainable economic growth as depicted in Vision 2030.



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ACRONYMS AND ABBREVIATIONS

DRC	Democratic Republic of Congo
EPL	Exclusive Prospecting Licence
ERSMA	Erongo Small Miners Association
GSN	Geological Survey of Namibia
HS	Harmonized Commodity Description and Coding System
ISIC	International Standard Industrial Classification
JASSONA	Jewellers Association of Namibia
KARSMA	//Kharas Small Miners Association
KGC	Keetmanshoop Gemstone Centre
KUNSMA	Kunene Small Miners Association
MCL	Mining Claim Licence
MET	Ministry of Environment and Tourism
MET	Ministry of Environment and Tourism
MITSMED	Ministry of Industrialisation, Trade and SME Development
ML	Mining Licence
MME	Ministry of Mines and Energy
NCCI	Namibia Chamber of Commerce and Industry
NEPL	Non- Exclusive Prospecting Licence
NGOs	Non-Governmental Organisations
NTF	Namibia Trade Forum
NUST	Namibia University of Science and Technology
PPD	Public Private Dialogue
RJC	Responsible Jewellery Council
RSA	Republic of South Africa
SME	Small and Medium Enterprise
SSM	Small Scale Miners
SSMA	Small Scale Miners Association
TBD	To Be Discussed
UN	United Nations
UNAM	University of Namibia
USD	United States Dollar
VC	Value Chain
VET	Vocational Education and Training

1. NAMIBIA'S JEWELLERY INDUSTRY AND THE COLOURED GEMSTONE VALUE CHAIN

1. NAMIBIA'S JEWELLERY INDUSTRY AND THE COLOURED GEMSTONE VALUE CHAIN

The government of the Republic of Namibia, through its Growth at Home Strategy, aims to develop industrial value-chain activities based on Namibian resources and raw materials. With its abundant resources in precious and semi-precious stones, Namibia is poised to have a significant competitive advantage in the development of a gemstone-based processing and manufacturing industry. However, like most other African countries, so far Namibia has been unable to develop an internationally competitive industry, either in the field of lapidary (the processing of semi-precious stones in a worked state through cutting and polishing) or the field of jewellery (the manufacturing of jewellery and other adornment products based on semi-precious stones) due to the fact that the value chain currently does not operate in a way that fosters value addition in Namibia. The main catalyst for growth in the jewellery industry is considering all the value chain segments as part of a production system, which needs to be improved at each and every stage to achieve sustainable industry growth.
The present industry growth strategy attempts to link all value-chain actors and functions as part of the system. This approach is based on system efficiencies rather than unit process optimisation. The proposed interventions are expected to have a significant impact on value addition and productivity, export and income levels.

1.1 Industry Definition

From a production point of view, according to ISIC, Rev. 4, economic activities related to the production of precious and semi-precious stones in the worked state (lapidary activities, mainly cutting and polishing of rough stones) and the manufacture of jewellery of precious and semi-precious stones fall together under Class 3211: "Manufacturing of jewellery and related articles". Thus, by international standards, the production of intermediate products (worked stones, mainly faceted stones and cabochons) and the production of consumer end products elaborated from gemstones, i.e. jewellery products and other adornment artefacts, are both considered manufacturing activities.

Most international production statistics, however, do not differentiate between semi-precious and precious stones, with the exception of diamond-related activities, which are usually categorised separately.
The term gemstone is widely used to refer to any piece of mineral or organic material (such as amber) used in the production of jewellery and other adornment products, displays or objects of art because it possesses beauty, durability and rarity. It should be pointed out, however, that among the more than 4,000 mineral species, only about 100 possess these attributes, and they alone are therefore considered to be gemstones, with silicates being the largest group in terms of chemical composition. Gemstones can be further subdivided into natural and synthetic gemstones, and the former sub-group can again be subdivided into diamond and coloured gemstones. Therefore, the expressions semi-precious stones and natural coloured gemstones can be considered synonyms.

Processing and manufacturing activities specifically related to semi-precious stones (or natural coloured gemstones) are at the core of the present industry growth strategy. Within the value-chain approach adopted during this process, the strategy will also address relevant aspects of primary production that, by ISIC, Rev. 4 standards, refer to Class 0899: Mining and quarrying n.e.c (which includes gemstones, quartz, mica, etc.) and take into account important aspects of trade with rough stones, worked stones,

jewellery and other adornment products (wholesale: ISIC Division 46 and retail: ISIC Division 47), given the fact that these upstream and downstream activities have a strong influence on the competitiveness of the transformation segment of the value chain.

From the product perspective, which is important for assessing an industry's contribution to cross-border trade, within the Harmonized System (HS) classification, trade with semi-precious and precious stones (again excluding diamonds) is classified under the 4-digit code 7103, which comprises both unworked stones (rough gems) and worked stones (cut and polished gemstones), but no jewellery articles (i.e. gems that are strung, mounted or set). Only at the 6-digit level is a further distinction made between rough and worked stones, with the code 710310 comprising precious stones (other than diamonds) and semi-precious stones, unworked or simply sawn or roughly shaped, while the code 710399 refers to worked gemstones.

Trade with end products made from semi-precious stones, i.e. jewellery and other adornment products from natural coloured gemstones, is more difficult to track, as HS codes related to jewellery and other adornment products, unlike the codes for rough and worked stones, also include products elaborated from diamonds. The 4-digit HS code 7113 comprises "Articles of jewellery and parts thereof", i.e. also jewellery products that do not contain gemstones; code 7116 comprises other adornment and home décor artefacts based on semi-precious stones, but also articles involving natural or cultured pearls, precious stones and even synthetic or reconstructed stones. Only at the 6-digit level does HS code 71162011 specifically refer to "necklaces, bracelets and other articles, wholly of natural precious or semi-precious stones, simply strung, without fasteners or other accessories", while code 71162080 contains "articles of precious or semi-precious stones n.e.s.", i.e. all other jewellery and adornment artefacts elaborated from one of the above-mentioned materials.

Thus the semi-precious stones (or coloured natural gemstones) value chain comprises all economic activities related to primary production (commercial and artisanal mining of rough stones), manufacturing of intermediate products (worked stones) and end products (jewellery and other adornment products), as well as trade in all kinds of semi-precious stone products of Namibian origin.

More specifically, the denomination Namibian jewellery industry only entails economic activities carried out in Namibia in the fields of lapidary (cutting and polishing of gemstones) and the manufacturing of jewellery and other adornment products that use rough or worked natural coloured gemstones as an essential input. This precision becomes necessary, because the jewellery industry would otherwise also include diamond- and precious-metal-related manufacturing activities carried out in the country.

In order to make precise the scope of the present analysis and strategy, an industry definition will be adopted that combines both perspectives (industry and value chain) and is in line with the international classifications of economic activities and products outlined above: Namibian jewellery industry and coloured gemstone value chain. This definition excludes all economic activities and products related to diamonds (as they are not a coloured gemstone). The exclusion of diamond-related activities, despite their economic importance, is justified by the different nature of the diamond value chain and its mode of operation in the Namibian and global contexts.

1.2 Global and Regional Industry Performance

On the international scale, increased consolidation in the value chain has seen the emergence of larger players who have integrated different segments of the value chain for coloured gemstones, from source to supply (Cross et al., 2010). There are, however, no dominant production or trading companies, and a literature study reveals that no single operating entity controls more than 2% of the market measured either in volume or the value of shipments (Lopez et al., 2007). Virtually all coloured gemstones are mined in low-cost, widely dispersed artisanal and small-scale mines in remote or inaccessible and mineral-rich parts of the non-industrialised world or the global south. Regions with major deposits of coloured gemstones are shown in Table 1.

Table 1: Regions and countries with major coloured gemstone deposits

Asia-Pacific	
Afghanistan	Aquamarine, beryl, emerald, kunzite, lapis lazuli, ruby and tourmaline
Australia	Beryl, opal and sapphire
Myanmar	Beryl, jade, ruby, sapphire and topaz
Sri Lanka	Beryl, ruby, sapphire and topaz
Central and South America	
Brazil	Agate, amethyst, beryl, ruby, sapphire, topaz and tourmaline
Colombia	Beryl, emerald and sapphire
Mexico	Agate, opal and topaz

Source: Cross et al., 2010

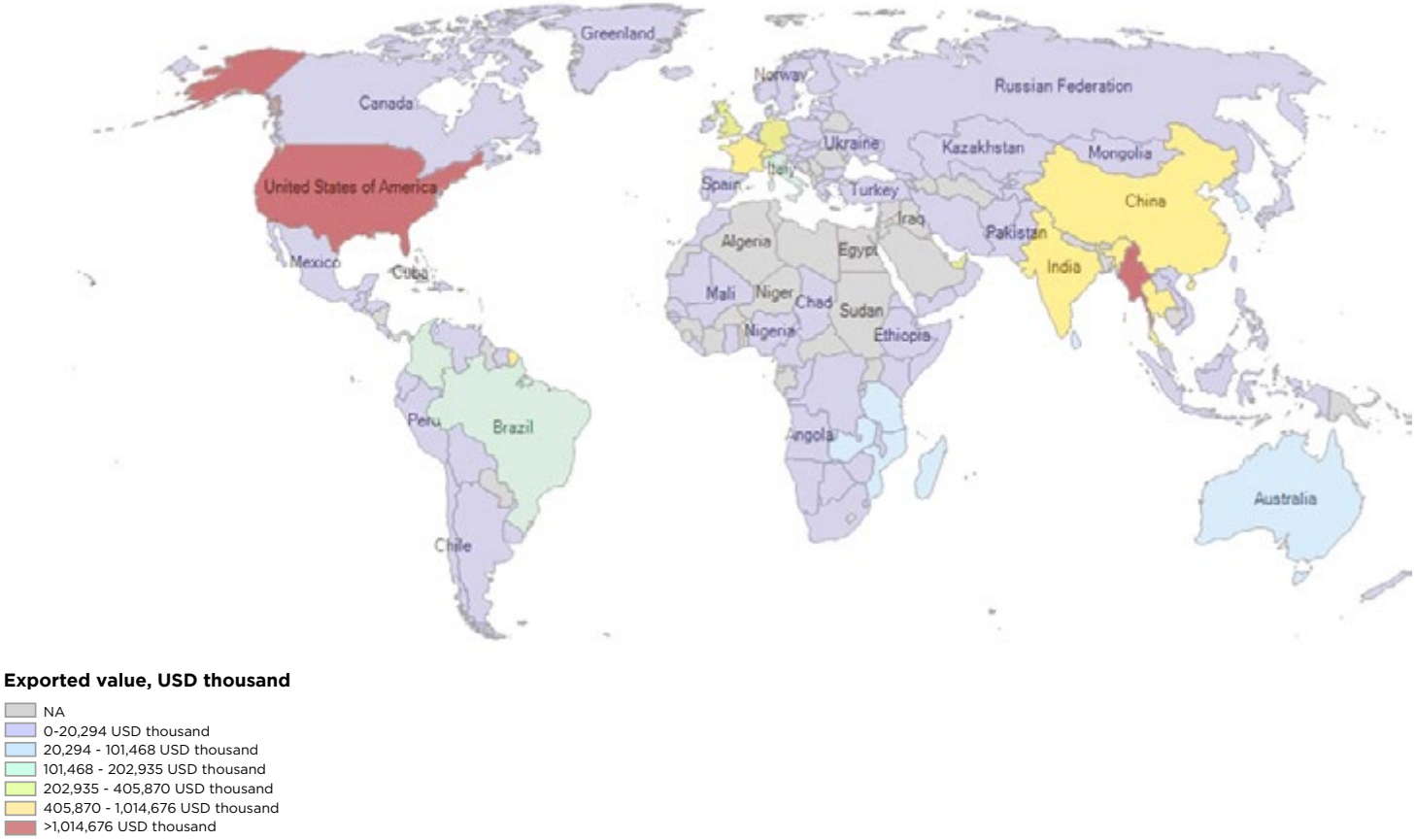


Figure 1: Current exporters of unworked and worked gemstones (2015, by value)
Source: ITC calculations based on UN Comtrade statistics

According to the latest UN Comtrade statistics (Figure 1), the three major exporters of unworked and worked semi-precious stones (not strung, mounted or set; excluding diamonds and jewellery products) are Myanmar, the United States and Thailand, Myanmar being the new global export champion (reported value of exports in 2015: USD 2.03 billion; share in global exports: 23%), followed by the US (USD 1.61 billion; 18.3%) and Thailand (1.03 billion; 11.7%). Total world exports in 2015 are reported at USD 8.8 billion, a 63% increase in only five years. The three above-mentioned countries together account for about half of the value of global exports. Other relevant exporters for rough and cut stones, with total export market shares ranging between 5 and 10%, are Switzerland (9.1%), India (5.4%) and China (5.1%).

Data on imports reveal that, with the possible exception of Myanmar (where only mirror data are available), the major exporters of unworked and worked stones are also the major importers. This reflects the fact that, once mined, rough gems eventually end up in one of the world's leading cutting and polishing centres for coloured gemstones. This group conforms to China, which accounted for more than 40% of global gemstone imports (import value: USD 4.36 billion), followed by the USA (USD 1.81 billion; 16.8%), India (USD 1.59 billion; 14.7%), Switzerland (USD 880 million; 8.1%) and Thailand (USD 375 million; 3.5%). So lapidary is predominantly carried out in Asia (Myanmar, Thailand, China and India), but also in the USA and Switzerland, with raw stones that are sourced, both legally and illegally, in the deposit-rich areas of the world outlined above.

The price of gemstones is mainly determined by their colour, clarity and cut. Table 2 gives an indication of the prices of some of the cut coloured gemstones (in USD, 2007 and 2012). Several forces drove the price hike despite the global financial crisis: Along with the continuous demand from big, fast-growing emerging economies like China and India, another reason was economic insecurity itself. Like gold, gemstones are seen by many buyers as a tangible store of value in turbulent times.

Table 2: Price index for coloured gemstones (US wholesale prices in USD per carat in 2012)

Gemstone	Price in USD		Major source countries
	2007	2012	
Amethyst	15	25	Brazil, Bolivia, Zambia, Madagascar and Russia
Blue sapphire	1,375	1,900	Australia, Thailand, Sri Lanka, Myanmar, India
Blue topaz	10	10	Brazil, Nigeria, Australia, Myanmar, Mexico, Namibia
Emerald	4,000	4,400	Colombia, Zambia, Brazil, Pakistan, Zimbabwe
Green tourmaline	60	70	Brazil, Afghanistan, Myanmar, India, Kenya, Madagascar
Pink tourmaline	125	170	Brazil, Afghanistan, Myanmar, India, Kenya, Madagascar
Rhodolite garnet	30	45	Sri Lanka, India, East Africa
Ruby	2,000	2,600	Thailand, Myanmar, Cambodia, Sri Lanka, Kenya
Tanzanite	450	375	Tanzania

Source: U.S. Geological Survey Minerals Yearbook 2012

Exporting Countries in 2015

Product: 7116 Articles of Natural or Cultured Pearls, Precious/Semi Precious Stones

Figure 2: Current exporters of gemstone end products (2015, by value)
Source: ITC calculations based on UN Comtrade statistics

Figure 2 shows global exports of end products made from semi-precious stones, i.e. jewellery and other adornment products; it is based on HS code 7116 which, as outlined above, also includes articles of natural or cultured pearls, precious stones and synthetic or reconstructed stones. China remains the major exporter of end products, though its share in world exports has been declining in recent years (from 43.4% of global exports in 2011 to 23.5% in 2015). A similar trend can be observed for the USA, which currently ranks third in world exports but has also declined from 29.2% in 2011 to 19.7% in 2015. On the other side, the United Arab Emirates (ranking second) and Myanmar (ranking fourth) are characterised by their rapidly growing participation in global jewellery exports. The remaining gemstone jewellery exporting countries that make up the current top 10 are Hong Kong, Switzerland, Taiwan, Japan, Germany and France, although the latter countries are also characterised by stagnant or declining world market shares. The emerging markets like China and India, which are traditional jewellery centres of consumption, are expected to develop as the largest consumption markets for both traditional and branded jewellery.

Gemstone Production in Africa

For 2015, significant exports of rough and worked coloured gemstones are only reported from Mozambique (USD 99.3 million), Zambia (USD 59.7 million), Tanzania (USD 53.5 million), Madagascar (USD 25.1 million) and Ethiopia (USD 15.9 million) (Table 3). These five countries together represent roughly 88% of official African exports of coloured gemstones by value when calculated over a five-year period (2011–2015) (Figure 3).

Calculating the real volume and value of production and trade in African coloured gemstones is extremely difficult. Estimates suggest that the majority of production and trade is undocumented and takes place in the informal, unregulated or even illicit economy beyond state control and official statistics. For example, by 2001, Madagascar's annual coloured gemstone production was estimated to be worth USD 400 million. Given the officially recorded 2001 exports were only USD 9.4 million, it seems most of the country's stones were being exported illegally. Similarly, a majority of Zambia's gemstones likely leave the country unofficially (Cross et al., 2010).

Table 3: African exports of worked and unworked gemstones, 2011–2015 (by value, in USD thousand)

Country	2011	2012	2013	2014	2015
Mozambique	660	465	1,096	80,392	99,335
Zambia	47,450	49,471	68,810	95,803	59,718
Tanzania	35,017	41,206	68,186	38,164	53,536
Madagascar	27,958	24,973	21,886	25,226	25,114
Ethiopia	7,621	9,569	11,370	18,943	15,916
Africa (aggregation)	132,264	137,051	187,278	280,186	289,757

Source: SOMO based on UN Comtrade (in USD thousands)

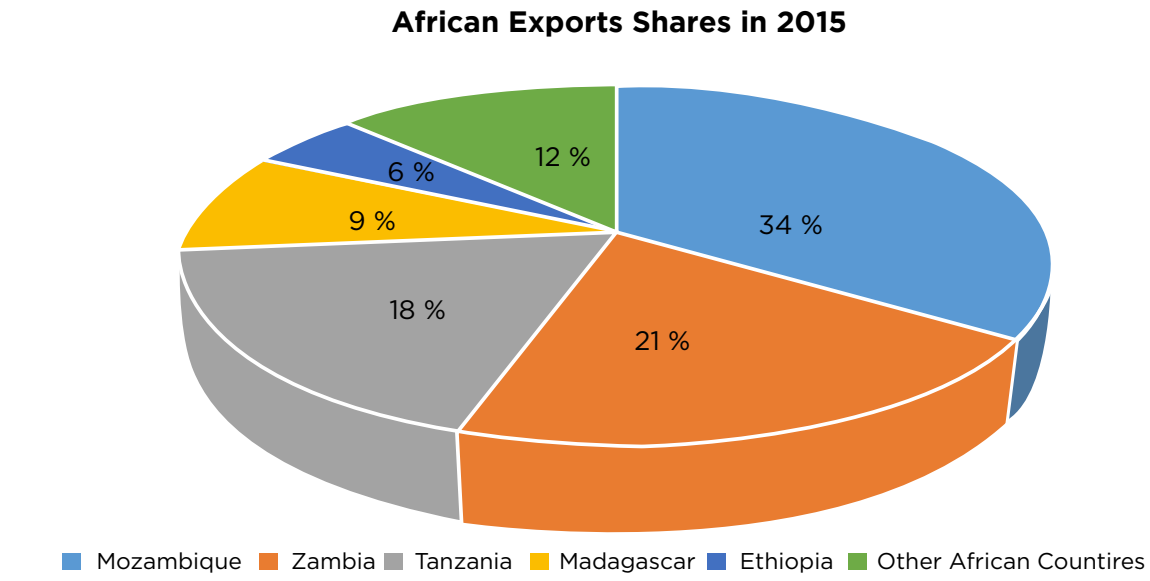


Figure 3: Participation of Africa's five leading exporters of worked and unworked gemstones in total regional exports (2015, by value)
Source: SOMO based on calculations from UN Comtrade statistics

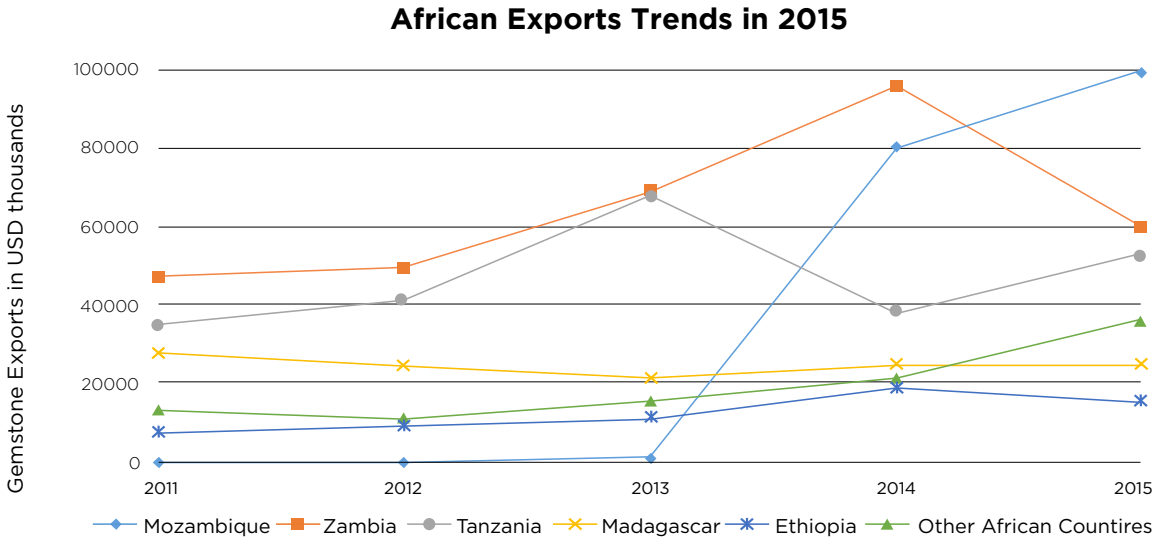


Figure 4 Worked/unworked gemstone export trends (2011–2015, by value)
Source: UN Comtrade statistics

Figure 4 shows the variability in trade of African unworked and worked gemstones. Most likely due to persistent reporting problems, it can be seen that officially recorded gemstone export activities remain volatile, although the available data suggest that regional exports have experienced significant growth in recent years.

Table 4: Comparison of exports of world's gemstone end products with exports from Africa (2015, by value)

Exporters	Value (in USD thousands)				
	2011	2012	2013	2014	2015
World	1,919,323	1,665,035	2,240,027	2,560,690	2,667,980
Mauritius	232	51	6	2	10,004
Kenya	40	-	55	724	788
Zambia	277	447	145	457	415
South Africa	354	5,243	745	4,042	411
DRC	120	146	156	191	229
African export share of world exports	0.07%	0.36%	0.06%	0.23%	0.47%

Source: UN Comtrade statistics

As shown in Figure 2 and further detailed in Table 4, the entire African continent accounted for less than 0.5% of the total value of global exports of gemstone jewellery and adornment articles in 2015, though there are many non-reporting countries in the region for this product category. The only major jewellery-exporting country in the region is Mauritius, ranking 18th in worldwide exports and accounting for more than 80% of the value of finished gemstone product exports from Africa in 2015.

Although Mauritius could be considered the regional benchmarking country in terms of its jewellery industry, it is also evident from the table that these exports fluctuate strongly (registered exports from Mauritius were negligible in the years 2012–14). Despite the finding that officially registered gemstone jewellery and adornment article exports from the region have increased in recent years from an extremely low level, as has the region's overall share in global exports of gemstone products, inconsistency in reporting remains a major concern regarding production and trade of manufactured end products.

1.3 Industry Background and Evolution in Namibia

Namibia has been well known for a century for its semi-precious stones, the most famous being tourmaline, with the beryl varieties (aquamarine, heliodor and morganite) and topaz also of major significance. Tourmaline remains to this day an important semi-precious commodity, along with amethyst, rose quartz and smoky quartz. The small-scale production of dioptase, chrysocolla and pyrophyllite is also noteworthy.

The gemstone value chain in Namibia started as a by-product of other mining operations. In most cases,

tin mining was the starting point, as tourmaline was often found as an associated material. Beryl was mined for its beryllium content, which was of strategic importance during World Wars I and II; during the same period, aquamarine was discovered as well.

Most of the Namibian semi-precious stones are recovered from late pan-African pegmatites, though amethyst is currently produced from a deposit hosted by Damaran marbles. From the early days of the industry, production has always been irregularly controlled and reported, so the cumulative production figures may not be accurate. Moreover, gemstone mining in Namibia is traditionally considered a small-scale mining activity, and as such its development is generally not well documented.

1.4 Characterisation of Value-Chain Actors and Their Functions

The types of actors and relationships among stakeholders in the semi-precious stone value chain differ from those in the diamond value chain. Unlike the latter, the coloured gemstone value chain remains highly fragmented at all levels, from exploration and mining to processing, manufacturing, distribution and retail. The value chain is composed of the following basic segments, with direct and indirect stakeholders whose characteristics, core functions and activities can be described in the following ways:

Primary Production (Prospecting and Mining of Rough Gems)

Whereas diamond mining is controlled by a few major mining companies, the coloured stone deposits are predominantly worked by independent, small-scale miners, though there is also a small group of larger mechanised mining operations in the primary production segment.

A non-exclusive prospecting licence (NEPL) is given to people who have reached the age of majority or companies registered in Namibia. Full contact details and a police clearance or conduct certificate must be part of the application documentation. The application is made to the Commissioner of Mines, the issuing authority. The commissioner may attach any conditions that are relevant and necessary to the licence, which is issued for a period of 12 calendar months and is non-transferrable and non-renewable. The purpose of this licence is to allow the holder to conduct non-exclusive prospection of minerals as specified in the application only. This is most suitable for small-scale miners, and it is their preferred choice. However, under this licence, sales of minerals are not permitted; the authority directs the miner to register a claim licence first. Production figures are mandatory, and they are to be kept for three years after the licence expires.

A mining claim licence (MCL) is intended for Namibian small-scale operators, and it has some exclusive rights attached. Getting this licence involves "pegging", which simply implies registering an area containing the deposit with surveyed boundary details at the Commissioner's Office for a specific mineral or minerals. The erection of pegs (or beacons) at the corners of this area gives rise to the name of the process and the licence itself. Miners peg areas where they have located suitable deposits during their NEPL activities. Pegging a claim is only allowed for individuals who hold a valid NEPL and are Namibian citizens. Alternatively, companies with a provision in their registration stating that only Namibians or wholly Namibian-owned companies are allowed to own a stake in the company may peg a claim. The licence holder then has the right to mine and dispose of (including by selling) such minerals within this claim's boundary, i.e. the licence holders are permitted to transact their products, unlike NEPL holders. A pegged claim licence is then registered with the commissioner, with full contact details and a conduct certificate provided as requirements. The particulars of a mineral or mineral group being mined must be submitted, as well as an environmental contract from the MET. The MCL holder is then required to keep proper records for at least three years of unit mining operations, unit mine costs and expenses incurred during

the course of mining. The MCL is valid for an initial period of three years and is renewable for subsequent two-year periods. No individual or company may own more than ten claims without the written permission of the Minister of Mines and Energy.

An application for an Exclusive Prospecting Licence (EPL) may be made by a natural person, a company or an accredited agent on behalf of a client. The application is to be accompanied by full details of a work programme and prospecting operations to be undertaken, and specifying the minerals to be explored is mandatory. It is easily confused with the Mining Licence (ML) by speculators. Any company or any citizen of Namibia who has attained a majority age may apply for an EPL. The application is made to the Minister who is the issuing authority and it should be noted that there is no nationality restrictions on this application. It is generally intended for commercial entities although individuals may apply for it. An EPL is valid for a period of no more than three years and subsequently two years upon renewal. It may not be renewed for more than two occasions. The technical requirements for this licence are advanced, so it is not suited for small-scale operators. Levels of competencies, environmental controls and reporting processes are such that only commercial entities can satisfy them.

A Mining Licence (ML) can be a consequence of an EPL or a direct acquisition of an existing deposit as a business asset. The requirements are similar to those of an EPL and as such they are not suited to small operators either. Obligations and responsibilities are beyond the skills level of those suitable for MCL hence it excludes small-scale miners from venturing into a mining licence. The costs are also prohibitive.

Table 5: List of mining licences and exclusive prospecting licences

Status	Commodity	Company	Region/ district
Granted	Semi-precious stones	Purity Manganese (Pty) Ltd	Otjoz-Okahandja
Granted	Semi-precious stones	Purity Manganese (Pty) Ltd	Otjoz-Okahandja
Granted	Semi-precious stones	Purity Manganese (Pty) Ltd	Otjoz-Okahandja
Granted	Semi-precious stones	Hoanib Exploration (Pty) Ltd	Kunene-Outjo
Granted	Semi-precious stones	Kleynhans Johannes Adolf	Otjoz-Grootfontein
Granted	Semi-precious stones	Manger Mining (Pty) Ltd	Erongo-Karibib
Granted	Semi-precious stones	Four Mining Company (Pty) Ltd	//Kharas-Luderitz
Granted	Semi-precious stones	Four Mining Company (Pty) Ltd	//Kharas-Luderitz
Granted	Semi-precious stones	Small miners of Uis	Erongo-Omaruru
Granted	Semi-precious stones	Small miners of Uis	Erongo-Omaruru
Granted	Semi-precious stones	Igneous Mining Projects (Pty) Ltd	Kunene-Opuwo
Pending	Semi-precious stones	Hoanib Exploration (Pty) Ltd	Erongo-Karibib
Pending	Semi-precious stones	Hiskia Karihangana	//Kharas-Karasburg
Granted	Semi-precious stones	Eventure Stratergic Consulting Namibia (Pty) Ltd	Khomas-Windhoek
X*	Blue Lace Agate	Ysterputz Mine	//Kharas-Grunau
X*	Demantoid	Green Dragon Mine	Erongo
X*	Rose Quartz	White House Lodge	//Kharas
X*	Dioptase	Omaue Mine	Kunene region

Source: MME database; "X" indicates that the type of licence could not be ascertained from the Ministry of Mines and Energy database.

Based on their type of licence, scale of operations and kind of equipment, the following three types of value-chain actors can be identified in the primary production segment:

- **Informal, unregistered entrepreneurs:** A significant proportion of all natural coloured gemstones is recovered intermittently by artisanal small-scale miners and prospectors. Small-scale mining, as a sub-sector of the mining sector, provides a livelihood to quite a number of people and their dependents, thereby alleviating poverty. According to MME estimates from 2012, countrywide, about 5,000 informal small-scale miners are involved in the mining of coloured gemstones.
  It is further estimated that there are about 2,000 small-scale miners in the Erongo Region alone, operating in cooperatives of about 10 members each. These cooperatives can be found mining semi-precious stones at Omatjette, Uis, Okombahe, Omaruru, Tsubusis, Otjimbingwe, Usakos and Walvis Bay. In the //Kharas Region, rose and smoky quartz, amethyst, agate and tourmaline are regularly produced in relatively large amounts by small-scale miners, while chrysocolla, dioptase and pyrophyllite are quarried more intermittently and on a smaller scale. Most of these operators are intermittent and would be difficult to assess.

- **Formally registered small-scale enterprises:** These are operating with non-exclusive prospecting licences (NEPL) and mining claim licences (MCL). The number of NEPLs specifically for coloured gemstones is difficult to verify, as the register does not specify the type of stone the licence holder is exploring for. Most of the formally registered small-scale miners have NEPLs. The percentages of active claims from regions with semi-precious stones are shown in Figure 3. The Ministry of Mines and Energy records for 2015 show that there are 744 semi-precious stone-mining claims spread across seven regions. Of these claims, 396 are active, 261 are expired, 76 are pending renewal and 11 are inactive (MME 2015).

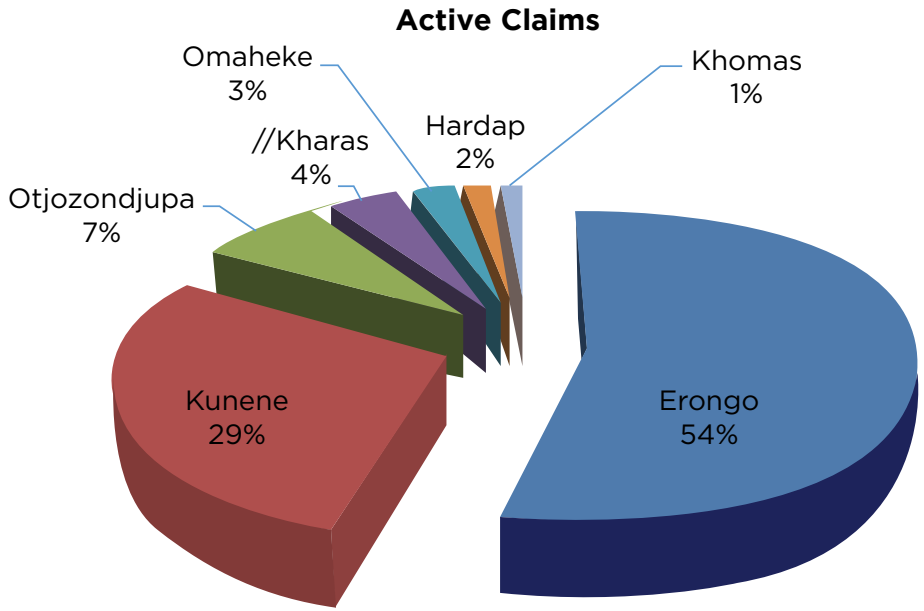


Figure 3: Regional distribution of active claims for semi-precious stones
Source: MME database 2015

- **Formally registered mechanised operations:** These are companies with modern mining technology and a bigger capacity, including the use of excavators and blasting methods. They operate using exclusive prospecting licences (EPL) and mining licences (ML). These formal enterprises are required by law to submit production reports to the Mining Commissioner at the Ministry of Mines and Energy, indicating their production volumes and values. However, these records are not available or documented. Fluctuations in production output maybe a result of underreporting and/or the lack of communication between the companies and the MME. The formally registered enterprises are listed in Table 6.

Table 6: List of formal registered mechanised operations

Region	Company	Product
//Kharas	White House Guest Farm	Rose quartz
Erongo	Green Dragon Mine	Demantoid
//Kharas	Ysterputz Mine	Blue lace agate

Source: NUST 2015

The White House Guest Farm operates a rose quartz quarry. The lodge is the administrative centre for the rose quartz production business. Production is well organised and regular, although it was suspended for a time due to depressed prices and demand. The business also runs a small jewellery operation, producing various items using imported stone products (including rose quartz) from South Africa. In terms of mining, it is a one-product operation; they produce only rose and sometimes strawberry quartz.

The Green Dragon Mine is currently the biggest and only commercial mine for demantoid garnets in the world. Located in central Namibia, the mining area extends over more than 100,000 hectares, producing one of the most precious and valuable coloured stones. The Green Dragon Mine is an open pit mine. Mining is conducted with earthmoving equipment in combination with conveyer belts, crushing plants and sorting facilities.

Agate is mined on a commercial scale at the Ysterputz Farm deposit by the formally registered Ysterputz Mine southwest of Karasburg, where light blue, greyish-blue and white agate have been worked since 1964. The material is marketed as blue lace agate through Cape Town. Mining is open pit, using a front-end loader and three bakkies.

A sizeable sodalite deposit is found in Kunene region (Kaokoveld area). Most of the deep-blue material is contained in dykes of semi-precious stone quality, although a lower-grade stone has also been utilised for ornamental purposes and as interior facing material.

Omaue Mine has copper sulfide mineralisation in quartz veins within limestones of the Otavi group. It has a well-developed oxidation zone with secondary copper minerals - world famous for dioptase specimens. Both dioptase and chrysocolla are produced at the open pit Omaue Mine in the northwest. Although dioptase is too soft to be facetted, single crystals and clusters can be used in jewellery manufacturing.

Trade with Rough Gemstones

It was found in interviews that substantial quantities of rough gemstones are leaving Namibia; however, it is impossible to establish exact annual quantities. Given the current reporting practices, a perusal of the Mining Office records of exported materials will no doubt reveal that

only a small quantity was produced and exported and all of it was of low quality. However, this contrasts with the amount and quality of Namibian material offered on the world market; the number of brand-new vehicles and mining equipment in Karibib and its environs also tells a different story. From the interviews conducted during the research phase, it is estimated that as much 80–90% of the total output of semi-precious stones leave Namibia as rough gems to be further processed elsewhere, while a small percentage are even finding their way back to Namibia, cut and/or polished to international standards, as an input for local jewellery-manufacturing activities. South Africa, China, the United States of America, Germany and Sweden are the main markets for Namibia's rough coloured gemstones. Value chain actors engaged in mining face less competition, as geological settings determine what is found at the mine and what is sellable. However, the local lapidary, manufacturing and trading businesses are competing with well-established networks and entrepreneurs from South Africa and beyond.

In this segment of the value chain, the following three types of actors were identified:

- **Direct sales by miners:** Both informal and registered small-scale miners sell a proportion of their raw stones directly, mainly in the open market, to local end customers and tourists. Only to a very limited extent do miners sell their stones directly to local gemstone processors and jewellery manufacturers. Volumes and values of directly marketed rough gemstones are difficult to estimate, since presently no one is submitting production or sales reports. Another form of "direct sales" which is common throughout the country is trade in kind; equipment suppliers receive a substantial portion of the mined output as payment for hiring out the mining equipment. Among some of the well-equipped and funded mines, owners are foreign nationals and/or sell their products directly to foreign corporate buyers and customers, including online (see for example the website of the Green Dragon Mine: http://www.demantoid.co).
- **Unregistered informal traders and retailers:** Small-scale miners often sell their rough stones informally to international traders. Dealers from India, Thailand and China have maintained a presence in Namibia, and they purchase much of the rough, uncut gem output. Most of the small-scale miners have well-established business linkages with foreign gemstone traders, who usually have good access to foreign markets. Miners contact traders to come and buy the stones once they are mined. This arrangement offers foreign buyers privileged access to prime-quality rough gems over their local competitors, as they tend to offer higher prices than local traders due to the favourable exchange rate, which puts the foreign traders at an advantage. Furthermore, the foreign traders offer cash on the spot, whereas local support markets take time to pay for deliveries. The foreign traders are not coordinated in their business dealings, however. Namibian industry stakeholders consider this raw material trade scenario to leave largely sub-standard rough stones available for local processing. In some cases, local informal traders resell the stones they purchase from small-scale miners to foreign traders. Aside from this informal trade, informal retail of rough coloured gemstones such as tourmaline, quartz, topaz and tantalite and crystal specimens occurs at various open-market locations throughout Namibia – along roadsides, at a specially erected market at the T-junction off the Henties Bay–Usakos road, outside the Swakopmund Aquarium, on Independence Avenue in Windhoek, etc. As mentioned, some of the small-scale miners or their family members are directly engaged in informal retail at these locations.
- **Local formal traders and retailers:** About 20 local retailers are operating in Namibia who market rough gemstones, mainly as collectors' pieces (crystals and specimens). While there are a few local retail businesses specialising in rough gems and minerals, such as Windhoek-based House of Gems (www.namrocks.com), which combines in-store and online sales of Namibian specimens to the international mineral community, most retail establishments offer a broader range

of products consisting of rough and worked gems, manufactured jewellery, adornments and home décor products. Only a small percentage of formal businesses perform an intermediary or wholesale function, i.e. supplying other local processors and jewellers with raw material; in both the formal and informal rough stone trade and retail segment, tourists are an important customer segment, including retail establishments such as the Kristall Galerie in Swakopmund. In recent years, there has been a rising trend towards online sales of rough (and worked) gemstones via websites operated by local retailers and traders, for example www.erongominerals.com and www.namibiangemstones.com.

Lapidary and Trade with Worked Gemstones

Lapidary refers to the first-stage processing or working of rough gemstones, mainly cutting and polishing. As mentioned earlier, according to estimates by industry stakeholders and experts, only 10–20% of all the coloured gemstones mined in Namibia are currently processed in the country, while prime-quality rough gems tend to leave the country unprocessed. In the processing segment of the value chain, the following actors were identified:

- **Informal individual cutters and polishers:** This group of artisans has limited business organisation, equipment and skills, but there are many operators. Their products are traded informally in open markets like the Henties Bay Junction gemstone market outside Usakos, Windhoek's Independence Avenue carpark, Swakopmund (Aquarium carpark), etc. Trading is by on-the-spot price agreement with the buyer, who is usually a tourist.

- **Formally registered individual cutters and polishers:** People in this category are artisans who have received formal training and education in cutting and polishing. Some may hold certificates in basic cutting and polishing from either the Karibib or the Keetmanshoop gemstone-training centres. This group also includes artisans formally employed at local jewellery businesses, which sometimes combine lapidary with jewellery-manufacturing skills.

- **Formal lapidary SMEs:** Though there are two vertically integrated companies that combine lapidary and mining (Southern Gems and Desert Gems), vertical integration of lapidary and jewellery manufacturing is more common. Most of the jewellers who do lapidary run their own local retail shops at strategic locations where they sell both worked gemstones and final products to local and international customers. For example, Gold Ideas runs a shop in Sam Nujoma Avenue in Klein Windhoek, where tourists and locals frequent restaurants. Both jewellers and formal SMEs specialising in lapidary prefer to source most of their raw materials from outside Namibia, where they have built strong business relationships based on mutual trust and quality service with commercial rough stone suppliers. Their material is sourced primarily from South Africa, as they have problems accessing locally mined prime-quality rough gems.

Table 7 lists the major formally registered gemstone cutters and polishers in Namibia, including businesses that combine mining, lapidary and jewellery manufacturing activities.

Table 7: Major Formal Gemstone Cutters and Polishers / Lapidary SME in Namibia (and vertically integrated companies)

Company	Location	Degree of Vertical Integration			
		Primary production	Lapidary	Manufacturing	Wholesale & Retail
Adrian and Meyer	Windhoek			X	X
African Art Jewellers	Swakopmund			X	X
African Kirikara Art	Windhoek			X	X
Canto Goldschmiede Atelier	Windhoek			X	X
Creative Silver	Windhoek			X	X
GoldIdeas	Windhoek		X	X	X
Golden Art	Windhoek		X	X	X
H Knop Jeweller – Goldsmith	Windhoek			X	X
Heidi's Goldschmiede	Swakopmund			X	X
Henckert Tourist Center	Karibib		X	X	X
House of Gems	Windhoek		X	X	X
Kristall Galerie	Swakopmund	X	X	X	X
Desert Gems	Swakopmund	X	X	X	X
Southern Gems	Keetmanshoop	X	X	X	X
Namibia Gemstones	Outjo	X	X	X	X

Source: NUST Field Survey Analysis

Manufacturing and Trade of Jewellery and Home Décor Artefacts

Jewellery manufacturing is the most prominent and commercially relevant form of local value addition to cut and polished semi-precious stones of Namibian (and foreign) origin, by means of setting the stones such that they form an original piece of craftsmanship. Leading jewellery manufacturers use both in-house and external designers to create their unique product designs. Windhoek, Swakopmund, Karibib and Keetmanshoop are Namibia's major local jewellery-manufacturing hubs, while minor jewellery-manufacturing activities are located in Grünau, Karasburg and Outjo. Manufacturing of home décor and adornment artefacts is less relevant in commercial terms, but some of the jewellery manufacturers also perform it.

Within the jewellery- and adornment-manufacturing segment of the value chain, there are different types of businesses, i.e. in terms of their levels of specialisation and

vertical integration, formality, technology use, innovation capacities, range of customers and target markets. As already mentioned, vertical integration of lapidary and jewellery manufacturing is quite common, given the limited overall size of the industrial segment of the value chain compared to primary production. Two examples of vertically integrated jewellery and adornment-product manufacturers:

- Desert Gems is a small, family-owned company with a retail shop located in the Swakopmund town centre. The company has been active in the industry since 1984 and is active today throughout the entire natural coloured gemstone value chain. The company owners have active claims in mining, but they source most of their various stones from Namibian small-scale miners and traders. These stones are then transformed into a wide range of processed and manufactured products, i.e. specimen stones, tumbled stones, jewellery and adornment articles, etc. Thus, their product range reflects the various stages of value addition.

- Gold Ideas sources cut and polished stones from Namibia and abroad and sets them in fine jewellery that is designed and manufactured in house. The company does not cut and polish stones as part of its main business. Gold Ideas works with any stones found in Namibia that come in satisfactory quality, including aquamarine, tourmaline, different types of garnet and quartz. According to the owner, , the type of stone does not limit the work of a goldsmith; most stones found in Namibia can be turned into fine jewellery if the jeweller keeps an open mind towards design. About 85% of the Gold Ideas customer base is local, according to its owner.

While some local manufacturing businesses are also involved in lapidary and even mining activities, it is more common to find businesses that combine jewellery manufacturing and retail, as most Namibian jewellers market their products through their own retail outlets, targeting both tourists and local customers. Only some of the jewellery manufacturers also export their products, and only to a limited extent. This type of manufacturer is exemplified by Adrian & Mayer, where a professional team has gained a reputation for outstanding quality and an unmatched individual exclusivity in designs and skill.

Indirect Industry and Value Chain Stakeholders

The following are important indirect stakeholders as performers of essential industry and value-chain support and regulatory functions:

- Through its Small-Scale Miners Division, the Ministry of Mines and Energy (MME) assists small miners to conduct their business legally by issuing mining claims and non-exclusive prospecting licences (NEPL). They offer help with excavation safety and environmental compliance as well. The division also has input in the Equipment Aid Scheme through the Ministry of Industrialisation, Trade and SME Development.

- The Ministry of Environment and Tourism (MET) checks the environmental compliance of projects according to stipulated regulations under environmental law. It issues environmental clearance certificates to prospective miners during the licencing process. The ministry also issues environmental certificates to claim licence applicants.

- The Ministry of Industrialisation, Trade and SME Development (MITSMED) is responsible for developing and managing Namibia's economic regulatory regime, on the basis of which the country's domestic and external economic relations are conducted. This ministry is also responsible for promoting the growth and development of the economy through formulating and implementing appropriate policies to attract investment, increase trade and develop and expand the country's industrial base. Through MITSMED, the government of Namibia has invested in the infrastructure of gemstone centres in the //Kharas, Erongo and Kunene regions. Support for equipment procurement

(Equipment Aid Scheme) for SSM and for cutters and polishers has also been among the government's interventions in the value chain.

- The membership base of the Namibia Chamber of Commerce and Industry (NCCI) comprises companies across all economic sectors, including large, prominent companies and hundreds of SMEs. As a fully independent private-sector body, the NCCI identifies issues affecting the business environment and advocates for speedy resolutions. Benefits for NCCI members include networking opportunities (through NCCI events), listing on the NCCI membership directories, receiving regular information on trade and investment opportunities as well as referrals for services and trade enquiries, opportunities to participate in business missions (organised or received by the NCCI and its partners), and participation in NCCI demand-driven training programs.

- Cooperatives and associations provide fora for knowledge sharing, canvassing for support, assistance with applications for financial support, coordination of training programmes and cost-effective consultancy services required by their members. The associations of primary producers are largely territorial due to the geographical expanse of the country. For example, the Erongo Small Miners Association (ERSMA) represents those based in the Erongo Region, while the //Kharas Small Miners Association (KARSMA) represents those in the //Kharas and Hardap regions. Other associations include the Kunene Small Miners Association (KUNSMA), WELWITSCHIA and SOSMAN. The following table provides an overview of the representative bodies (associations and cooperatives) of the small-scale miners in the different regions and their main products.

Table 8: Representative bodies of small-scale miners

Region	Association or cooperative	Main products (facet, cabochon and specimen grade)
//Kharas	KARSMA /SOSMAN	Amethyst, garnet, topaz, agate, clear quartz, rose quartz, haematoid quartz, sceptre quartz
Erongo	ERSMA, Neuschwaben, Xobosxob	Black tourmaline, phantom quartz, smoky quartz, rose quartz, aquamarine, beryl, ilmenite, fluorite jeremejevite, feldspar, schorl, topaz, demantoid, phenakite, boltwoodite
Kunene	KUNSMA	Chrysocolla, dioptase, beryl, orange garnet, sodalite, tourmaline, malachite, spessartine, shattuckite

Source: NUST (2015)

- In the manufacturing segment of the value chain, the Jewellers Association of Namibia (JASSONA) represents jewellers' interests countrywide. As mentioned, many of the jewellers are vertically integrated and also actively involved in lapidary and retail of intermediate and final products, a few of them even in primary production. JASSONA promotes formal education and skill development for jewellery production, valuation, trading, etc., including opportunities for skill transfer via on-site training and apprenticeships. The 19 current JASSONA member businesses are listed in the following table.

Table 9: List of JASSONA members and their locations

Company Name	Location
Adrian & Meyer Jewellers	Windhoek
A. Böck Manufacture Africana cc	Windhoek
African Art Jewellers	Swakopmund
African Kirikara Art	Windhoek
Canto Goldschmiede Atelier	Windhoek
Creative Silver	Windhoek
Desert Gems	Swakopmund
Gold Ideas	Windhoek
Golden Art	Windhoek
H Knop Jeweller – Goldsmith	Windhoek
Heidi's Goldschmiede	Swakopmund
Henckert Tourist Centre	Karibib
House of Gems	Windhoek
Imke Engelhard Design cc	Swakopmund
Kristall Galerie	Swakopmund
Namibia Gemstones	Outjo
Pangolin Trading	Windhoek
Rolf Schmidt Goldschmiede	Swakopmund
Salomon Goldschmied	Swakopmund

Source: NUST (2015)

Of the existing producer associations along the value chain, JASSONA is the best organised and operates the most effectively; it is followed by ERSMA, which has received financial support from several donors in the past.

- Namibia University of Science and Technology (NUST) provides training in gemmology skills through the Keetmanshoop Gemstone Centre (KGC) and is in the process of developing an advanced gemmology course at its main campus in Windhoek. Namdeb provides in-house training on some of the relevant industry skills, and the University of Namibia (UNAM) also offers some elective advanced courses in gemmology. There are centres for vocational training facilitated by the Ministry of Industrialisation, Trade and SME Development in Karibib and Keetmanshoop.

- Financial institutions provide financial services based on viable business plans to SSM, processors and jewellers. To some extent, the institutions also provide mentorship to their clients on how to run their businesses. Prominent institutions making finances available to value-chain stakeholders are the SME Bank and the Development Bank of Namibia; commercial banking institutions also provide financial support.

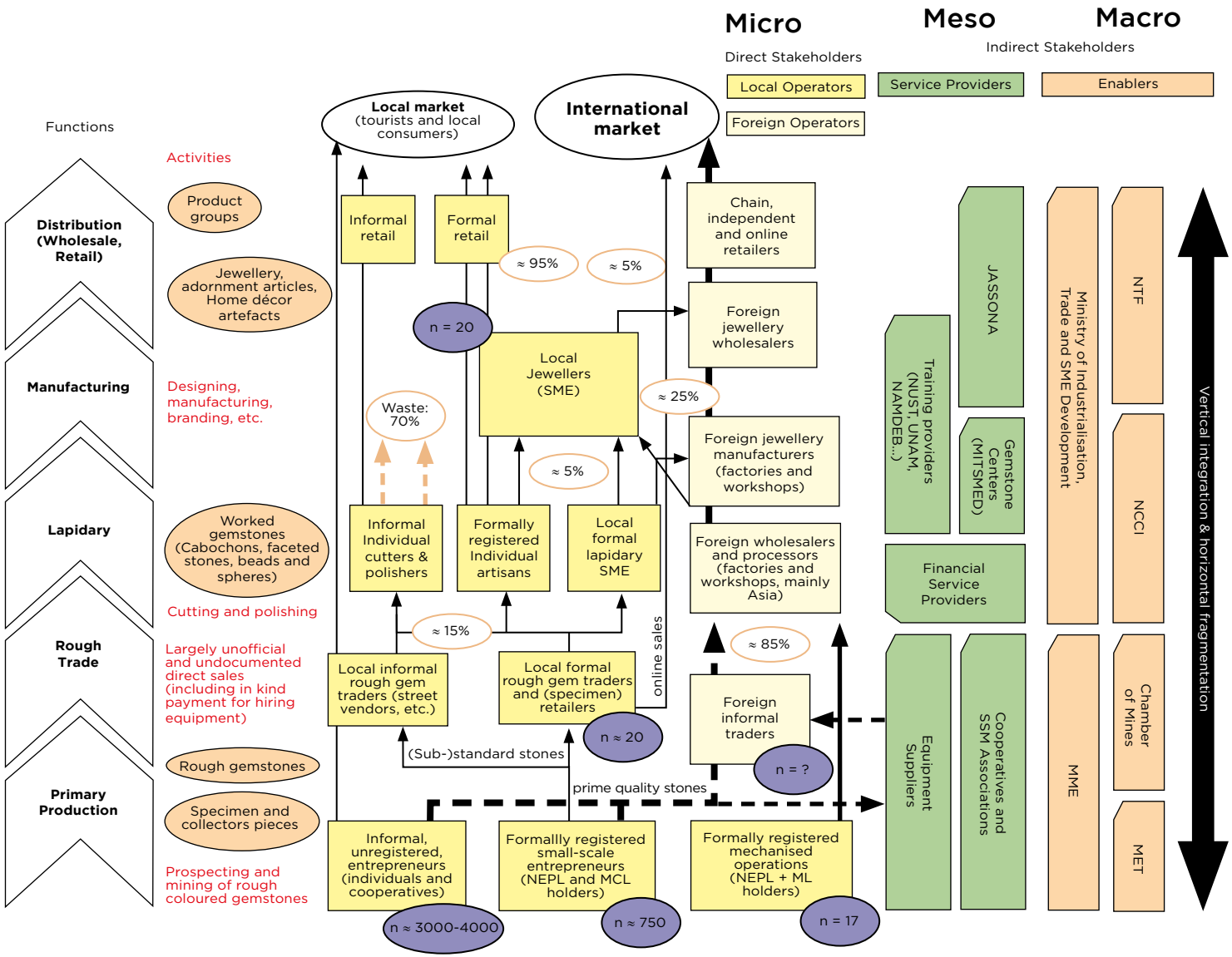


Figure 4: Value Chain Map Gemstone
Source: GIZ ProCOM, based on information by NUST 2015

1.5 Classification of Namibian Products

In general, within the value chain for natural coloured gemstones, there are three basic product types related to the chain segments described above:

- Primary products: rough gemstones and collector pieces (crystals and specimens)
- Intermediate/lapidary products: worked gemstones (cabochons, faceted stones, beads and spheres)
- Final manufacturing products: jewellery and other adornment/home décor articles

Primary Products: Rough Gemstones and Collector Pieces

A variety of gem-quality semi-precious stones are currently mined in Namibia. Rose and smoky quartz, amethyst, agate and tourmaline are regularly produced in relatively large volumes, while chrysocolla, dioptase and pyrophyllite are quarried more intermittently and on a smaller scale. An even wider range of natural coloured gemstones, including aquamarine, heliodor, morganite, topaz and gem-quality sodalite have been mined in significant quantities in the past; there are also numerous unmined deposits, but they are of low quality.

In Namibia, from 2006 to 2014, blue lace agate had the highest reported export volume, followed by sodalite, amazonite and quartz.

Rose quartz occurs and is mined in the vicinity of Rössing at the Hoffnungsstrahl and Roselis deposits, as well as at the Bella Rosa and Mickberg mines in the Karasburg district, where a light pink to deep rose quartz is obtained. Smoky quartz occurs in similar rock structures, but the only gem-quality material currently produced is from the Otjua deposit in the Karibib district.

Jasper deposits have been worked intermittently, mainly by small-scale miners, including mostly yellowish-brown material to the northwest of Rössing and near the old Khan copper mine.

The production of tourmaline fluctuates considerably from year to year; it averaged some 960 kg annually during 1987–91 but 100 kg in 2013–14. The largest output is from a deposit at Usakos, where most of the stones are green and bluish green. Other deposits are mined on a smaller scale, with a number of known occurrences containing gem-quality material. Blue- to emerald green and occasionally pink tourmalines are quarried at Otjua in the Karibib district and at Omapujo near Arandis.

Heliodor is a gem variety of beryl, with a golden-yellow or light yellow-green colour. Yellower versions can look very much like olivine, and it is very similar to chrysoberyl and some yellow-green tourmalines. Heliodor is found in association with aquamarine, and a yellowish-green variety is mined at Klein Spitzkoppe near Rössing on the Otavi railway line, east of Swakopmund, and also between Ai-Ais and Gaibes on the Fish River.

The Green Dragon Mine is currently the only commercial mine for demantoid garnets in the world. It is located in central Namibia and produces one of the most precious and valuable coloured stones. Namibian demantoid comes in shades ranging from yellow green to bluish green.

There are basically two categories of collector pieces: crystals and specimens. After sorting from mining, the stones are cleaned in order to enhance their appearance, since these types of products are mainly for display purposes in homes, workstations or museums.

Lapidary Products: Worked Gemstones (Cabochons, Faceted Stones, Beads and Spheres)

One of the simplest lapidary forms is the cabochon, a stone that is smoothly rounded and polished on top, is flattish and is either flat or slightly rounded on the bottom (which may be either polished or sanded). This form of cutting is

often used for opaque or translucent stones, but it is also frequently used for transparent materials with too many inclusions to yield a good faceted stone. Colouration and patterning provide the major interest in such stones. Cabochon cutting or cabbing is often performed by simply holding the stone in the fingers, but it is more commonly done by dopping the stone (i.e. attaching it with adhesive wax or glue) to a wooden or metal dopstick. This facilitates twirling the stone to form smooth curves and avoid creating flat areas during grinding, sanding and polishing. A typical cabbing machine holds several wheels representing a progressive series of diamond or silicon carbide grit, turned by a common arbor and motor, and a water supply that provides a coolant and lubricant to wash away debris and keep the stone from overheating as it is ground and sanded on progressively finer wheels.

Visual evidence at selling points suggests that much of the material found on the local market is cabochon. An estimate by numbers would be unrealistic and purely speculative, as there are no proper records to support this type of extrapolation. However, there are rare incidences of products of facet grade being on sale or display. By volume, cabochons sustain the business in most lapidary enterprises. It was also found in the discussions that the export of cabochons is not as significant as that of faceted stones.

Faceting is most often done on transparent stones. A faceting machine usually employs a motor that turns a lap, a water supply, an adjustable handpiece with index gears and a protractor, and an adjustable mast or platform to hold the handpiece assembly. Most commercially available gem-cutting machines use a mast, but a few use a platform. Flat facets are cut and polished over the entire surface of the stone, usually in a highly symmetrical pattern. The stone is dopped (usually with adhesive wax, epoxy or cyanoacrylate glue) on a metal dopstick, which is then inserted into a handpiece that allows precise control of positioning. The cutting angle is adjusted vertically via a protractor and rotationally via an index gear. The facets are then ground, sanded and polished on a rotating lap, while water or another liquid acts as a coolant and lubricant. When one side (top or bottom) of the stone is finished, a jig is used to transfer the stone to a dopstick on the opposing side.

Spheres are initially sawed into cubes or dodecahedrons and then ground to shape between two pipes or rotating concave cutters, allowing the stone to rotate freely in any direction to form a perfect spherical shape. As with other lapidary processes, gradually finer grades of abrasives are used to grind, sand and polish the stone. While beads may be faceted, they are more commonly cut and polished as small spheres and then drilled to allow stringing. Bead mills are used to grind and sand large quantities of beads simultaneously. They typically employ a grooved lap and a flat lap, between which the beads are rolled and worn to shape. After shaping and sanding, beads are usually polished by tumbling.

Final Products/Jewellery and Home Décor Artefacts

Numerous gemstone products can be classified under the product group jewellery. In jewellery manufacturing, natural coloured gemstones are usually combined with other materials. The value of the jewellery depends on the quality of the stones embedded in the item and of the other materials used. Some of the products that can be made during this phase are: engagement and dress rings, earrings, chains, crosses, crowns, pendants, wedding bands, cufflinks, bangles and watches.

In both intarsia and mosaic work, small bits of different coloured stones are fitted together and the top cut and polished to present a picture or other interesting pattern. Strictly speaking, a mosaic is constructed on top of a flat base made of another material (usually stone), while an intarsia (also known as a Florentine mosaic or pietre dure) is set flush into the surface of the base material. The finest intarsias and mosaics have traditionally been of Italian origin, but intarsia has enjoyed something of a renaissance in recent years with the fine work of artists such as Jim Kaufmann and Nicolai Medvedev.

Cameos and intaglios are similar to one another in that both are usually portraits carved in stone or seashells. They differ in that cameos are raised portraits, while intaglios are carved down into the surface of the material. Both typically take advantage of different-coloured layers of material. The finest cameos and intaglios have traditionally come from Italy (usually shell) and Germany (usually agate).

Rough coloured gemstones can be carved into an array of different products for display, for kitchen and office use and for landscaping decoration. These are very niche products and can be labelled for the purpose of this strategy as the product group home décor artefacts or adornment products.

Gemstones can be carved, like other materials, into almost any form, limited only by the talent of the sculptor. This is done with a variety of diamond-impregnated steel bits, saws and grindstones.

In an inlay, a gemstone is cut to fit and glued into a hollow recess in another material (metal, wood or other stone) and then the top ground down and polished flush with the surrounding material. Stones most commonly used for inlay are strongly coloured and opaque, like black onyx, lapis lazuli, turquoise and tiger's eye.

1.6 Local Industry Performance

Since official data on annual gemstone production and trade volumes are not available for many African countries, it is difficult to undertake regional comparisons and benchmarking analyses. Africa's participation in the value of world exports of rough and worked semi-precious stones is currently reported at only 3.1% (2015). At the same time, the value of regional exports has been constantly growing in recent years (from USD 132 million in 2011 to USD 288 million in 2015). It is difficult to say how much of this is owed to increased overall production, how much to higher prices and how much to improved reporting practices in some of the countries.

In quantitative terms, Namibia ranks sixth on the list of regional exporters, although with just 442 tonnes in 2014, export volumes have been much lower than those of Madagascar (19,214 tonnes), Mozambique (7,119 tonnes), Tanzania (estimated at 1,496 tonnes) or Zambia (estimated at 1,139 tonnes). If industry stakeholders and experts were correct when they estimated that officially registered quantities represented only 20 to 30% of real production, export quantities for Namibia would in fact have been similar to those of Tanzania and Zambia. In the absence of reliable data, however, it is difficult to adequately assess and monitor the performance of the Namibian jewellery industry and coloured gemstones value chain.

Figure 5 captures gemstone export volumes from Namibia from 2007 to 2014 (HS code 7103, which includes both rough and worked stones). A comparison between the internationally reported export volumes (UN Comtrade) and production figures from the MME (Table 10) reveals a data mismatch, as for some years reported gemstone export volumes are significantly higher than reported production volumes. This is yet another indicator of the reporting problems faced in Namibian gemstone production, which are due to the high degree of informality in the mining segment of the value chain. Given the scope of informal trade with rough stones, along with undeclared and under-declared exports, the following figures should be taken as merely indicative.

Table 10: Officially reported production data for coloured gemstones

	2006	2007	2008	2009	2010	2011	2012	2013	2014
Blue Chalcerdony (kg)	21,808	6,650	15,200	-	29, 697	-	13,600	48,500	6,000
Amazonite (kg)	1,090	35	10	-	-	-	-	-	1,500
Blue Lace Agate (kg)	172,060	145,090	154,700	153, 550	108,000	122,020	116,720	17,440	145,560
Quartz (kg)	17,216	4,091	31,351	29,297	21,662	2,100	78,006	98,350	225,286
Pietersite (kg)							400	572	-
Amethyst (kg)							5,800	2,222	-
Tormaline (kg)							5	43	165
Garnet (kg)							1	205,000	-
Andradite (kg)							46	800	13
Sodalite (kg)							240,000	6,349	152,500

Source: DSSM/MME 2015

Neither the official volumes nor the corresponding values of rough and worked gemstone exports are consistent: Volume-wise, between 2007 and 2014, UN Comtrade export figures fluctuated between more than 600 tonnes per annum (2008) and less than 200 tonnes (2013), with an average export volume of 270 tonnes per year (Figure 5). Similarly, export values fluctuated between USD 652,000 (2008) and USD 289,000 (2013) (Figure 6).

Interestingly, when HS 7103 is further disaggregated into rough and worked gemstones, it turns out that annual export revenues from worked gemstones (HS 710399) have been increasing disproportionately in recent years (Figure 7), from less than USD 100,000 in 2010 to almost USD 400,000 in 2014. Regarding volumes, available figures indicate that the export of finished gemstones increased from 63 tonnes to 166 tonnes in the same period, indicating an increase in unit value. These trends can be interpreted in terms of increased value addition happening in Namibia in the lapidary segment of the value chain. Nonetheless, it should be remembered that these export figures are still far below those of other African countries, with Namibia ranking only 10th among the regional exporters of worked gemstones.

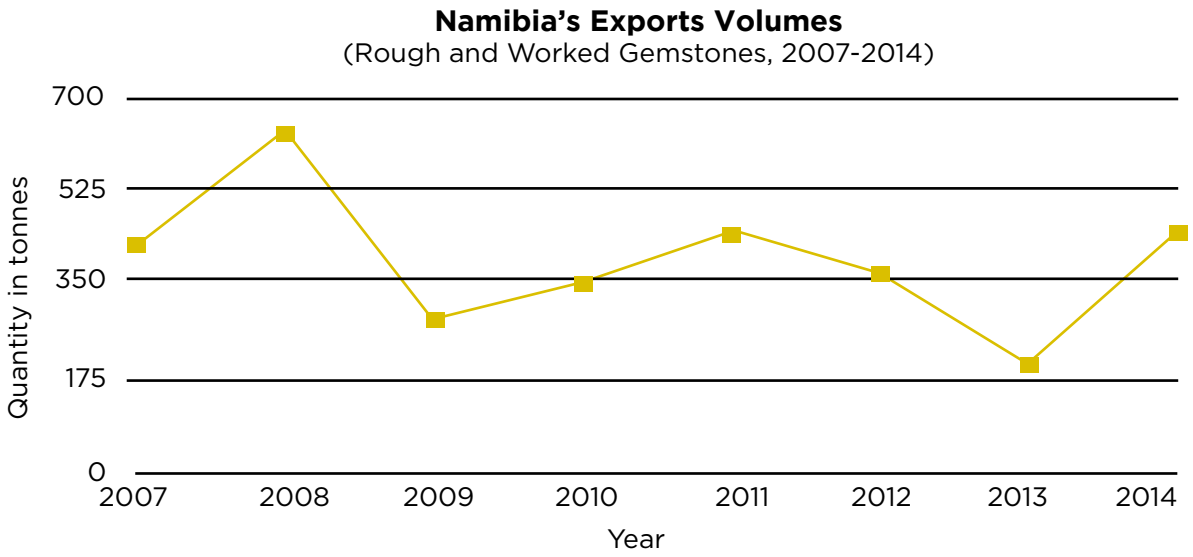


Figure 5: Volume of coloured gemstone exports (rough and worked) from Namibia
Source: UN Comtrade

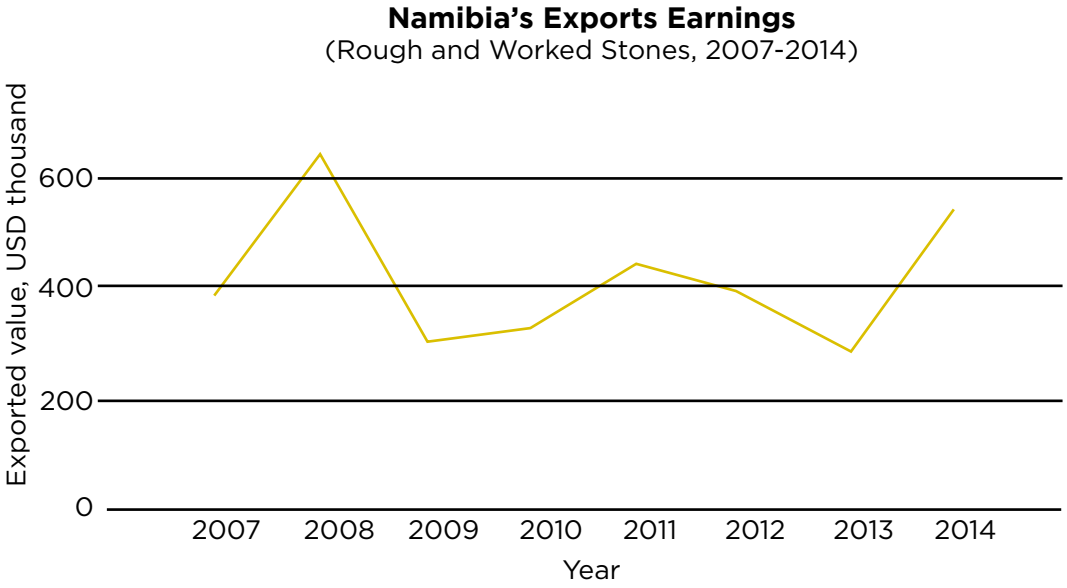


Figure 6: Namibian coloured gemstone export earnings (from rough and worked stones)
Source: Intracen, based on UN Comtrade statistics

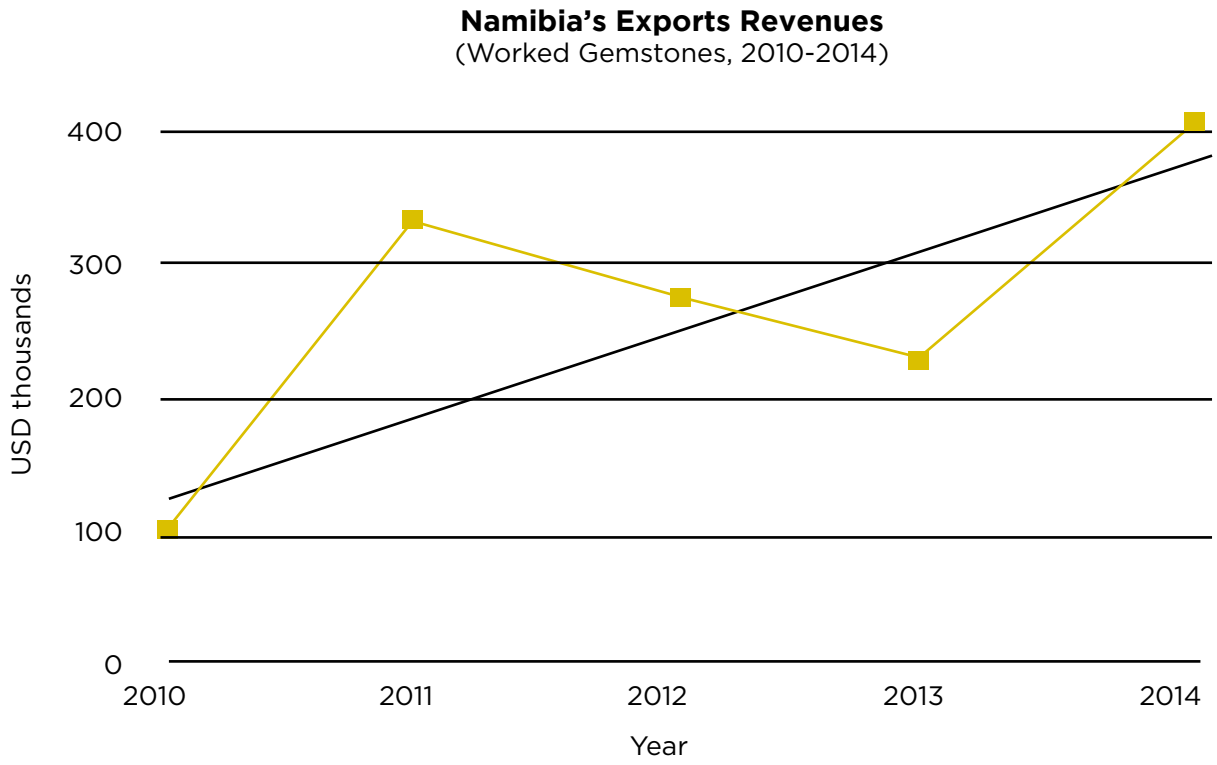


Figure 7: Export revenues from worked gemstones in Namibia, 2010–2014
Source: Intracen, based on UN Comtrade Statistics

1.7 Global and Regional Demand for Products of the Industry

In terms of trade partners, data on volumes of exported rough and worked stones clearly position South Africa as the dominant debtor country regarding rough stones. Of the total export quantity reported for 2014 (442 tonnes), 89% (392 tonnes) were taken to the RSA, 6% to Germany (27 tonnes), 4% (19 tonnes) to the USA and the remaining 1% to Angola, Hong Kong and Mauritius. Value-wise, though, the lead position of the RSA is less pronounced, as it accounted for only about one third of the total value of exports, due to a much lower average unit value (value/tonne) than for the exports to the other countries. The fact that Mauritania ranks third on the list of most important trade partners by value after Mauritius again shows that official data on gemstone exports should be taken with caution (it can be assumed that exports declared as going to Mauritania actually went to Mauritius). Even when official trade records for Namibian rough stones identify one dominant trade partner, it can be speculated that a significant share is re-exported from South Africa for further processing in other countries, such as Mauritius, Hong Kong and the USA. This hypothesis is underlined by the fact that Namibia's principal trade partner for worked coloured gemstones is Mauritius rather than South Africa (USD 174,000 vs. USD 65,000 in 2014; USD 230,000 when reported values for Mauritius and Mauritania are summed).

Concerning **trade with end products (jewellery and adornment articles)**, available data suggest that the industry's export activities have been even less consistent over time. Figures on exports of jewellery and other adornment articles are rather discouraging in terms of value addition. Apparently there are fewer established business linkages and distribution channels at the international level for these product groups. Like for rough stones, South Africa is by far the most important trading partner for product group HS 7113 (Articles of jewellery and parts thereof), but exports have been fluctuating steeply in recent years (Figure 8). Whereas for 2013, total exports to the RSA came to USD 1.5 million, in 2014, reported earnings from jewellery exports to the neighbouring country were only USD 72,000. Jewellery exports to other countries have been generally low and even more erratic in the past. An analysis of the HS code 7116 product group, which basically entails trade in gemstone-based home décor and adornment products, yields overall low and erratic values. It can therefore be concluded that trade in **manufactured end products is still largely focused on domestic retail sales to tourists and local customers.**

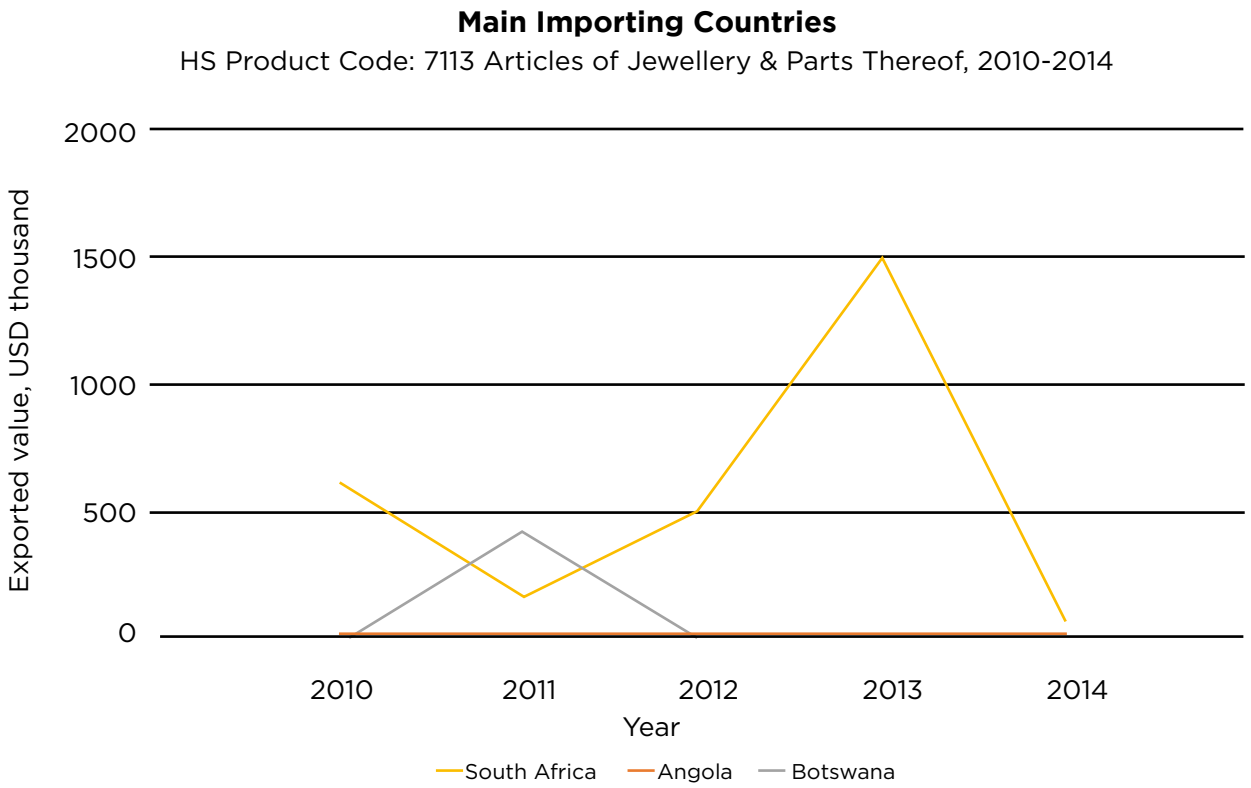


Figure 8: Exports of jewellery products from Namibia (in USD thousands, by value)
Source: Intracen, based on UN Comtrade Statistics

2. IDENTIFIED OPPORTUNITIES FOR AND CONSTRAINTS TO INDUSTRY GROWTH

2. IDENTIFIED OPPORTUNITIES FOR AND CONSTRAINTS TO INDUSTRY GROWTH

This chapter describes the identified constraints to and opportunities at micro, meso and macro level for the Namibian jewellery industry and coloured gemstone value chain according to the following analytical framework:

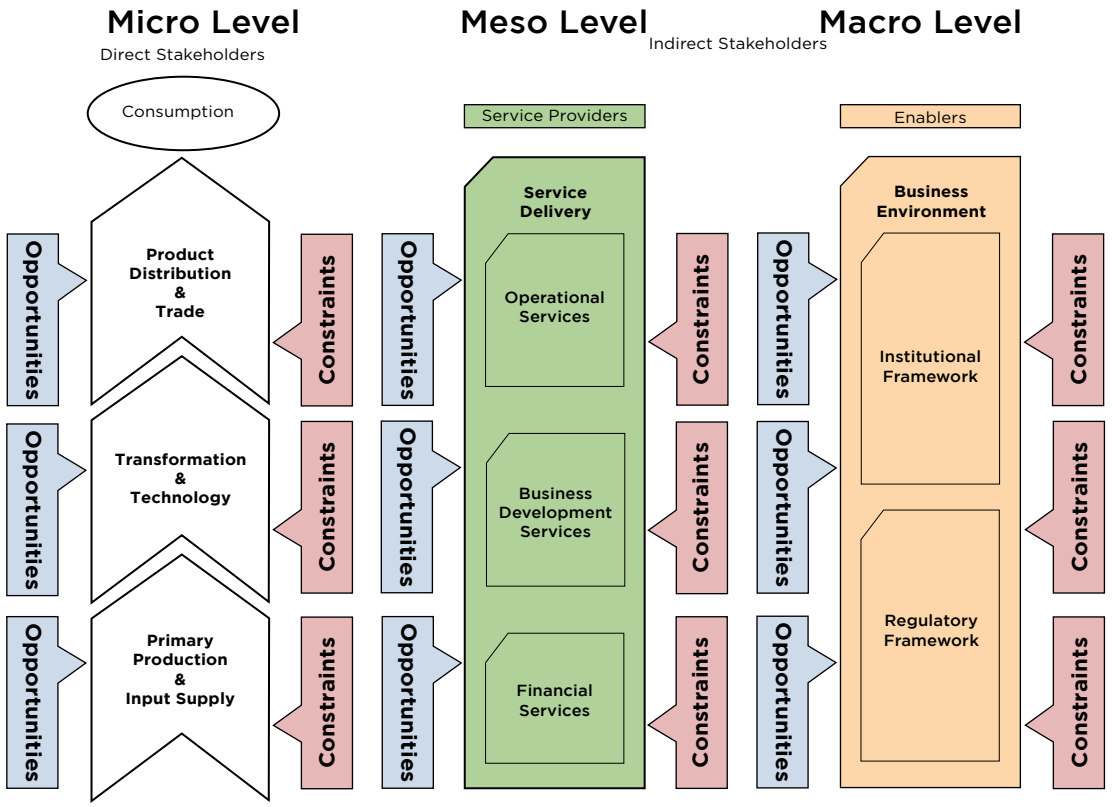


Figure 9: Analytical framework developed to identify opportunities and constraints
Source: GIZ ProCOM

2.1 Primary Production and Input Supply

Currently, insufficient factual information about semi-precious stone resources is available. Without this information about baseline geological data and resource availability, it is very difficult to devise and implement appropriate technologies or to formulate policies for industry growth. Moreover, all manufacturers look for consistency in both quality and availability for their products. This will only be possible with complete knowledge of available gemstone resources in the region. The Geological Survey of Namibia (GSN) is one of the oldest geological survey divisions in Africa and is capable of mapping raw-material resources through the Earth Data Namibia database. It facilitates the search for and the assessment of mineral resources, geological engineering and land-use planning through sustainable development, with due regard to the environment.

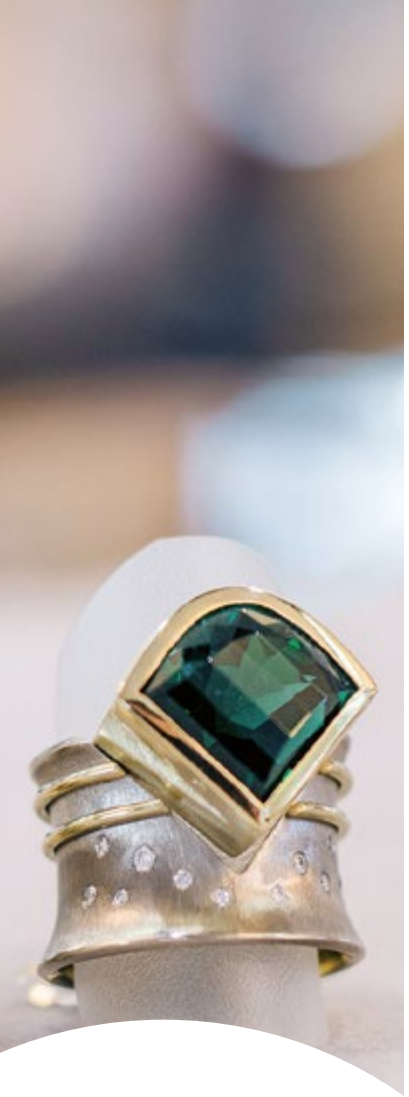
Gemstone resources across the country have not been fully explored; there is therefore the possibility of finding new gemstone deposits hidden in unexplored sites. Moreover, expanding production through familiarity with deposits will naturally lead to an increase in profitability.

Semi-precious stone exploration in Namibia is facing numerous challenges from areas such as technology, finance, legislation and skill capacity. Currently, exploration uses basic and very unreliable methods of discovering deposits. Visual prospecting is primarily used to prove mineralisation, with little sub-earth exploration. This not only poses great geological risks, but it also jeopardises the feasibility of the projects. Many explorers and miners waste their resources (financial, technical, manpower, etc.) on unfeasible sites due to poor exploration methods.

The mining technology and processes are rudimentary, resulting in significant waste at the extraction stage. Indiscriminate blasting damages the gemstone crystals and mineral specimens, reducing their value. Most mining practices are artisanal, employing handheld equipment like electric or pneumatic hammers, pick axes, compressors, hand shovels and crowbars.
Environmental damage is another consequence of inappropriate mining methods. Gemstone miners dig pits to excavate the gemstones, causing the mining area severe degradation. Inactive pits are not reclaimed, and excavated materials are not transported from the area but remain piled up near the mine pits, posing a danger to animals and to the miners themselves. Moreover, these pits are a potential acid mine drainage source during the rainy season, as the water reacts with the minerals in the waste rock and eventually leads to the contamination of ground and surface water.

In many countries across the world, including Namibia, measures for the prevention of mining accidents and other fatalities in small-scale gemstone mining do not exist. Health problems such as dust causing silicosis and noise causing tinnitus are evident in small-scale mining areas in Namibia. There are also many cases of physical injury within the mines due to rock falls and mine collapses. Digging in the fierce Namibian heat with basic hand tools is hard and often unsafe, particularly in locations such as the Erongo Mountains, where miners work at great heights without safety equipment. The locations are usually also very isolated, with no sanitation and only imported water supplies.

An estimated 80–90% of the rough gems mined in Namibia are exported without any industrial value addition. In most cases, miners sell their stones below market value due to a lack of formal trade mechanisms or formalised supplier–buyer relationships between small miners and local processing facilities, but also due to a general lack of knowledge of the real value of the stones. Miners are not usually in much of a bargaining position either, as they are in need of money at the time of making contact with any buyer. Despite the fact that some of the miners



have been trained in cutting and polishing, the absence of formal, transparent stone-marketing mechanisms and buyer relationships still remains a major detriment that has not yet been addressed.

As mentioned, the prevalence of informal stone-trading arrangements favours rough stone exports, which leads to an insufficient supply of quality gemstones for local processing and jewellery manufacturing and therefore is a central constraint to the further development of the Namibian jewellery industry.

Formalising both primary production and trade of raw material should be strongly incentivised, as it may eventually cut down the illicit flow away from Namibia and promote industry growth by making more medium- and high-quality stones available for local processing and manufacturing value addition. Namibia lacks internationally accredited gemstone centres to provide reliable valuation and certification services for gemstones. MME staff members are being trained in the valuation of gemstones. These staff members could assist or train small-scale miners to evaluate their gemstones. Furthermore, there are plans to set up a regional valuation and exchange centre, which could play a lead role in promoting fairness in the trade of rough stones. The exchange centre could host regular (e.g. quarterly) gemstone auctions for raw (and possibly also worked) stones and serve as a formal trade link between buyers and sellers, giving local and foreign buyers an equitable chance to access previously valuated medium- and high-quality gems. If properly designed and effectively addressing working capital constraints and cash needs, this trade mechanism could immensely benefit small-scale miners by ensuring them demand-based, real-market prices for their output. It would further help to improve documentation on production and trade volumes and values, which is currently lacking due to the prevailing practices of non- and under-reporting.

High dependency on imported inputs in jewellery manufacturing constrains the making of unique and competitively priced products. Whereas rough and worked gemstones for local manufacturing activities are at least partly sourced in Namibia, Namibian jewellers and adornment-product manufacturers source other required production inputs, namely gold, silver and diamonds, from abroad; getting hold of these inputs is a challenge in Namibia owing to regulations which do not favour local sourcing of high-value commodities. Since locally produced high-value inputs cannot be easily accessed, the manufacturers resort to imports. In times when the Namibian dollar has decreasing purchasing power against the US dollar (and forex in general), the lack of local sourcing options has a detrimental effect on the manufacturers' production costs and competitiveness.

2.2 Transformation and Technology

Gemstone processing, i.e. cutting and polishing, faces critical skill and technological challenges in Namibia. Medium- and high-value stones tend to be processed in countries that have skill and cost advantages. There is a significant competitiveness gap in both cost and quality with Asia, where most cutting and polishing is currently carried out. The productivity levels of local cutters and polishers are below those of Asian competitors, and product quality does not match international standards. Most cut and polished stones are exported for reworking abroad.

The majority of local processors and manufacturers cannot sustain their business operations by adding value to local semi-precious stones alone. Blending local and imported stones is the prevalent business strategy of local jewellery manufacturers. The proliferation of synthetic and artificial stones and end products exerts further price pressures on local processors and manufacturers. Limited design capabilities, combined with a lack of modern manufacturing technologies and techniques, prevent the manufacturing segment of the value chain from realising its full potential.

Nonetheless, lapidary should be considered a promising focus for increased industrial value addition in

Namibia, as the price difference between rough and worked semi-precious stones can be 1:100 and more. There are on-going skill-development initiatives at two of the three gemstone centres (Keetmanshoop and Karibib). Support to the introduction of highly efficient and fully automated gemstone cutting and polishing machinery should be considered as a means for reducing waste, enhancing productivity and improving the quality of lapidary.

Moreover, long-term business linkages between local processors and manufacturers should be deliberately built up and pursued, especially closer cooperation between cutters and designers of high-end products.

The limited skilled workforce in jewellery design is another major constraint on the industry. There are no skill-training institutes for jewellery manufacturers, goldsmiths or silversmiths operating in Namibia. Although local manufacturing companies develop skills through in-house training on the job, it is always a challenge for them to retain skilled talent, since qualified employees eventually start their own businesses, even when there are only limited offers in the field of entrepreneurship skill development.

Setting up a manufacturing business requires a massive capital outlay, if the company is to be competitive in local, regional and even international markets. Buying and setting up industrial equipment is very expensive. This is a serious challenge and will require all value chain stakeholders to build closer relationships in order to jointly develop a competitive advantage for the value chain as a whole. The present scenario provides a good platform for establishing more synergies between processors and manufacturers, as well as between local industry players and small-scale miners.

Namibia has the potential to manufacture both traditional and modern jewellery products, and there is also great potential for diversifying the industry's product and service range, e.g. sculpture, ornamentation, restoration and repairs. Namibian jewellery manufacturers are capable of providing customised pieces, thereby growing their presence in this profitable market segment.

2.3 Product Distribution and Trade

Local market demand, i.e. foreign visitors and local clients looking for customised design cuts, currently sustains a limited number of Namibian lapidary and jewellery-manufacturing businesses. Little active effort has been made so far to develop export markets for Namibian value-added intermediate and end products, which are barely known outside the country. Electronic sales channels are not widely used in the industry, which limits the international marketing of (semi-) finished gemstone products.

The image of "genuine Namibian gemstones and jewellery" has to be improved. Since Namibia has some high-quality semi-precious stones, there is potential for developing a Namibian brand to support both local and international marketing and promotion efforts.

On the one hand, the supply of synthetic stones and jewellery is increasing, which highlights the need to effectively differentiate products made of genuine gemstones. On the other hand, a branding initiative should not only emphasise the intrinsic qualities and uniqueness of genuine Namibian gemstone products but also be built on sustainable production practices along the value chain. This would serve as a marketing and branding device for intermediate and end products made in Namibia and also as a concrete way to overcome some of the identified key constraints to sustainable growth, especially in the primary production segment. With gemstones as with other products, discerning consumers are becoming increasingly aware of the manifold environmental and social (including health) challenges associated with artisanal or small-scale production. This trend started some decades ago with food products but in recent years has become more widespread for high-profile consumer products, including jewellery. As unsustainable

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small-scale mining practices and unfair trade conditions have been receiving increased public attention in recent years through critical press and media coverage, initial efforts have arisen in the field of sustainably sourced and fairly traded metal, jewellery and stone products. The Responsible Jewellery Council (RJC) is a non-profit standard-setting and certification organisation, currently with 700 member companies spanning the jewellery value chain from mine to retail. Through its Code of Practices and chain-of-custody certification for precious metals, the RJC promotes an international standard for responsible business practices for diamonds, gold and platinum group metals, addressing human and labour rights, environmental impact, sustainable mining practices and other critical issues in the jewellery value chain.

Whereas the RJC initiative supports improvements in medium- and large-scale mining operations, since its start in 2011 the certification process for Fairtrade gold has operated only via SSM associations in order to engage directly with small-scale mining, which in the case of gold accounts for only 15% of global production but provides jobs and income to about 90% of the labour force in the global gold-mining industry. Like small-scale gemstone mining in Namibia, artisanal gold mining is carried out in many countries by disadvantaged social groups seeking a higher income to escape from poverty, but they mine under hazardous working conditions that pose severe risks to their health and to the environment around the mine, and then do not receive an adequate price for the gold they unearth. Fairtrade-certified gold comes from artisanal and small-scale mining organisations in Peru, Uganda, Kenya and Tanzania that meet the Fairtrade standard for gold and precious metals in terms of responsible mining and trading, and small-scale miners receive a Fairtrade minimum price and a premium to support social, environmental and economic development in their communities. Gold jewellery stamped with the Fairtrade mark offers an ethical alternative to conscious consumers and international market access and a fair price to small-scale miners, which allows them to tackle their most pressing development needs. Fairtrade certification mandates use of protective gear and health and safety training for all SSM operations, which must also use safe and responsible practices for management of toxic chemicals in gold recovery. Since its launch, Fairtrade gold and jewellery has received so much interest from media and policy makers that consumer demand (and demand within the jewellery industry) far outweighs the current size of the Fairtrade gold market. It is thus a good example of the huge potential benefits to all value-chain stakeholders of jointly implementing social and environmental standards, when these standards effectively inspire confidence in consumers and retailers that the offered products not only are of the highest quality but also contribute to poverty eradication and sustainable development processes in the country of origin. However, with natural coloured gemstones, product branding in combination with sustainability certification would require joint efforts between stakeholders from the different value-chain segments (small-scale miners, mechanised mining operations, local processors, designers and jewellery manufacturers) as well as support agencies. Since Namibia is internationally acclaimed for its good mining governance, collaborating with internationally recognised organisations in this field could provide an interesting opportunity to grow Namibia's lapidary and jewellery industry.

Linking the gemstone value chain closer to tourism is another opportunity to be further explored, as sales to foreign visitors through local retail outlets are already an important distribution channel for jewellery and other products. For example, a pilot project on sustainable gemstone mining, lapidary and jewellery manufacturing could include a tourism component allowing interested visitors to learn about Namibian coloured gemstones and to witness the benefits of sustainable supply chains.

Furthermore, there is an opportunity to establish better access to international markets by changing legislation to make it easier for gemstone processors and manufacturers to export their products or by supporting their participation in international exchanges and trade fairs.

The latter would provide valuable business contacts and benchmarking information to industry stakeholders and keep them updated on international design and price trends.

2.4 Service Delivery

There are no local, regional or even third-level institutions educating gemmologists and providing relevant gemmological research and innovation services. Vocational training opportunities in the value chain are limited, there is no investment in research and product development, and linkages between training institutes and the industry are weak.

A practical assessment of training needs for miners, processors, jewellers, traders and the other critical actors across the semi-precious stone value chain must be conducted.

There is urgent need to improve the Namibian capacity for value-chain-based development planning through research, education and international networking. If this capacity is built, Namibia can be developed as an innovation, research and education hub for applied gemmological sciences, contributing to the local, regional and continental self-sustainability and benefitting the gemstone industry.

The government of Namibia has invested in the infrastructure of gemstone centres in the !
//Kharas, Erongo and Kunene regions. The operations of the Keetmanshoop Gemstone Centre have been reviewed, and a new institutional structure is currently being drafted. The Karibib centre has been running its basic training services with government support for some years now, and industry stakeholders believe its capacity and quality of services may deserve attention. Specific attention should also be given to future collaboration and further synergies between the centre and the regional SSM organisation ERSMA. The Opuwo Centre is not operational presently; neither was the Keetmanshoop Centre until 2011, when it was reviewed in collaboration with Nordic partners, the government and Namibia University of Science and Technology. The centres could form a strong basis from which to build future extension offices providing one-stop-shop services in all matters related to small-scale mining, gemstone valuation, trading, etc. and addressing the environmental and entrepreneurial needs of small-scale miners.

Support for equipment procurement (Equipment Aid Scheme) for SSM and cutters and polishers has been a prominent part of government intervention in the value chain. The European Commission has been financially and technically supporting Erongo Region SSM operations and their trading facilities; it has also provided tools, but they are presently facing operational and economic sustainability challenges. The Finnish embassy supported ERSMA in its institutional capacity-building endeavours during 2013–2014.

Additionally, access to finance or the lack thereof has a ripple effect on small-scale gemstone mining. The high capital outlay required before the production of semi-precious stones can start is a barrier to formal gemstone mining. Most of the time, miners do not have the starting capital to acquire the tools they need, nor do they have access to credit from formal financial institutions to finance their operational requirements. Investors avoid the small-scale mining business, as it is considered risky. It is therefore very difficult to attract more investments while information on existing gemstone resources is unavailable.

2.5 Business environment

Mining regulatory systems guarantee security of tenure to mineral rights owners. Mineral rights are transferable and can be mortgaged by both small- and large-scale mineral rights holders. However, non-exclusive prospecting licences (NEPL) and mining claim licences (MCL) specifically for gemstone mining are difficult to acquire. Obtaining a mining claim license is a tedi-

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ous, centralised and time-consuming process involving different government agencies and technical requirements (pegging the claim, obtaining an environmental contract, etc.) which make it difficult for SSM operations to acquire one.

NEPLs specifically for the gemstone sector are difficult to quantify, as the NEPL register does not specify the stone being sought. Only EPL and ML holders are required by law to submit production reports to the MME indicating volumes and values. Currently, there are only about 17 formally registered stone-mining enterprises that submit production reports to the MME.

Thus, the high level of informality within this heavily fragmented value chain (at the mining, trading and even processing levels) has been contributing to a generalised lack of reliable data on real industry performance and overall relevance for the Namibian economy – which has in turn limited the attention that the industry and value chain receives from policy makers. More income for the government could be realised through improved reporting mechanisms and coordination between government ministries and agencies. For example, local gemstone buyers cannot compete on equal terms with foreign buyers due to taxation skewed in favour of foreign buyers; foreign buyers only pay a 2% export permit tax over the value declared by the exporter. Due to expertise and control constraints, there is a strong incentive for under-declaration. In terms of costs, skewed taxation leaves local buyers at a disadvantage and allows foreign buyers to raise their price offers to the miners, ultimately at the expense of local processing and manufacturing.

Although various government agencies and donors have implemented measures to improve productivity levels at different stages of the VC, they are piecemeal and uncoordinated and therefore do not have meaningful success. Despite external support, support services offered by SSM associations to SSM operators have limited effect in the fields of mining rights, technology and equipment, and marketing. Small-scale miners fear interference and distrust outsiders; as a result, they tend to withhold information.

At the same time, there seems to be a general trend towards formalisation and consolidation in the industry, including a trend towards vertical (backward and forward) integration within the value chain. Building stronger long-term relationships between miners and local processors and manufacturers is possible through existing SSM associations and JASSONA.

3. INDUSTRY GROWTH STRATEGY

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3.1 Vision of Industry Stakeholders:

"By 2020, Namibia's jewellery industry will have increased its contribution to manufacturing employment and achieved significant production and export growth by means of effective support to formal trade of rough stones, worked gemstones and high-profile end products and additional services to enhance the productivity and sustainability of production activities along the coloured gemstones value chain."

The long-term vision for the local industry is for it to become a relevant player and role model in Southern Africa for the successful inclusion of small-scale miners and the effective promotion of increased local value addition to coloured gemstones; by promoting disclosure, transparency, education and certification, the industry will build up trustful relationships among value-chain stakeholders and inspire buyer confidence. Based on a positive image, the excellent reputation of genuine Namibian gemstone products and the adoption of sustainable production practices, the industry will be able to supply a growing range of quality products to discerning local, regional and international buyers.

3.2 Industry Growth Indicators and Targets:

- Increase the total production value of worked stones, jewellery and adornment products by at least 20% per year between 2017 and 2020
  (Base 2016: TBD; Target 2020: TBD; Data source: MITSMED and JASSONA, processor and manufacturer survey to be conducted);
- Grow the export value of rough and worked stones (HS 7103) and of jewellery and other adornment products (HS 7113 and HS 7116) by at least 25% per year between 2017 and 2020
  (Base 2012; 2014: USD 1.07 million (USD 545,000 (2014; HS 7103); USD 518,000 (2012; HS 7113); USD 6,000 (2014; HS 7116); Target 2017-2020: + 25% p.a.; Data source: NSA and Intracen / UN Comtrade);
- Grow total employment in lapidary and manufacturing by 20% by the year 2020 compared to 2016
  (Base 2016: TBD; Target 2020: TBD; Data source: MITSMED and JASSONA, processor and manufacturer survey to be conducted).

3.3 Strategic Objectives, Indicators and Proposed Interventions

The stakeholders identified 5 intervention areas:

Intervention Area 1: Primary Production and Input Supply	**Intervention Area 2:** Transformation and Technology	**Intervention Area 3:** Product Distribution and Trade	**Intervention Area 4:** Service Delivery	**Intervention Area 5:** Business Environment

Intervention Area 1: Primary production and Input Trade

Strategic Objective 1:

"Ensure sufficient supply of raw gemstones for local processing and manufacturing activities by improving exploration and mining practices and making trade mechanisms regarding rough gemstones more equitable, efficient and transparent."

Indicators and Targets:

- Increase knowledge of gemstone resources in Namibia by completing gemstone exploration and resource estimation for at least 10% of the area in Namibia by 2020;
- Increase the percentage of primary producers (entrepreneurs and enterprises) that apply good exploration and mining practices to at least 25% by 2020;
- Increase the volume/value of rough gemstones being valuated and traded via formalised mechanisms to at least 500 tonnes or USD 500,000 by 2020.

Proposed Interventions:

Int. Num.	Intervention	Key Activities	Proposed Champion(s)
1.1	**Mapping of gemstone deposits and dissemination of information**	• Conduct geological survey to identify new deposits • Map existing gemstone varieties and their resources across the country • Hire professionals to train Namibians to collect and process the resource information to maximise its usability • Ensure the dissemination of gemstone resource information in terms of maps, newsletters, etc.	GSN, MME and academic institutions
1.2	**Support for the adoption of good exploration and mining practices**	• Develop guidelines for choosing appropriate techniques for mining gemstone deposits • Train/educate the miners in the latest mining and exploration methods	GSN, SSMA and academic institutions
1.3	**Design and implementation of independent and transparent valuation and trading mechanisms for rough stones**	• Conduct feasibility study to establish regional valuation and trading centre(s) • Create independent, regional gemstone valuation services • Establish regional gemstone trading hubs	MITSMED and MME

Intervention Area 2: Transformation and Technology

Strategic Objective 2:

"Increase the efficiency and competitiveness of the local jewellery industry by supporting process and product innovations in line with detected market opportunities."

Indicators and Targets:

- Upgrade the equipment of at least 20% of local companies involved in gemstone processing and product manufacturing by 2020;
- Reduce waste during the processing and manufacturing stages to below 15% by 2020;
- Develop at least five product or process innovations in the industry by 2020;
- Increase the total production volume and value of intermediate products (worked stones) and end products (jewellery and other adornment articles) by at least 10% per year between 2017 and 2020.

Proposed Interventions:

Int. Num.	Intervention	Key Activities	Proposed Champion(s)
2.1	**Introduction of new and improved processing and manufacturing technologies/equipment**	• Upgrade existing technology at the stone centres for cutting and polishing and jewellery manufacturing • Support company investment in state-of-the-art technology for cutting and polishing, jewellery manufacturing and fabrication of ornamental products through grants or purchases • Work with equipment suppliers to provide equipment for training	MITSMED and industry companies
2.2	**Support to efficiency in cutting and polishing and jewellery manufacturing**	• Provide training to cutters, polishers and end-product manufacturers focused on waste reduction and optimisation of input use	MITSMED and JASSONA
2.3	**Support to product and process innovations in the Namibian jewellery industry**	• Identify the product mix to be pursued in processing (e.g. eggs, spheres, cabochons and faceted stones) and manufacturing (ornamental and jewellery products) according to demand trends and market opportunities • Support high-quality technical assistance and training offers in product design and innovation • Implement an industry-specific incentive scheme/support facility for applied product and process research and knowledge and technology transfer relevant to local innovation • Organise a (biannual) national innovation contest and innovation-focused conferences and exhibitions	MITSMED and JASSONA

Intervention Area 3: Product Distribution and Trade

Strategic Objective 3:

"Stimulate the demand for Namibian naturally coloured gemstone products in targeted local and foreign market segments through quality and sustainability management (i.e. certification) combined with product differentiation and promotion (i.e. branding) efforts."

Indicators and Targets:

- Institutionalise at least four new industry-wide marketing and promotion tools by 2020;
- Increase sales of raw, intermediate and final products that are marketed under quality and sustainability certifications by at least 50% per year between 2018 and 2020;
- Increase additional sales of intermediate and end products directly attributable to branding and promotion efforts by at least 25% per year between 2017 and 2020.

Proposed Interventions:

Int. Num.	Intervention	Key Activities	Proposed Champion(s)
3.1	**Development of a marketing and promotion strategy for Namibian gemstone products**	• Conduct a market survey to ascertain the size and properties of the local, regional and international markets for a range of intermediate and end products, including buyer requirements, customer preferences and relevant market trends • Develop a marketing and promotion strategy for prioritised products and market segments • Support the implementation of additional marketing and promotion tools outlined in the strategy (e.g. online sales platforms)	JASSONA
3.2	**Support to implementation of quality and sustainability certifications in the natural coloured gemstones VC**	• Conduct a benchmarking study to identify best practices in the field of quality and sustainability management and certifications for jewellery products, including practical recommendations for their application in the Namibian coloured gemstones VC • Design and implement a pilot project according to identified best practices and recommendations • Support the implementation of the pilot project through investments in quality infrastructure (e.g. testing facilities, laboratories), training activities and equipment, and auditing and certification processes for Namibian associations and companies, according to the requirements of the standards to be adopted	MITSMED, JASSONA
3.3	**Joint branding and promotion initiative**	• Develop an insignia brand for intermediate and end products made in Namibia (“Namib gems”), including promotion tools and activities • Support the elaboration of selected promotion materials related to the insignia brand (e.g. documentary, ads, (social) media campaigns, etc.) • Support participation of processors and manufacturers in regional and international trade fairs • Showcase Namibian jewellery and adornment products at hotels, lodges and guesthouses and make other promotion efforts in the tourist market segment	JASSONA and MITSMED

Intervention Area 4: Service Delivery

Strategic Objective 4:

"Support the development of a competitive and sustainable value chain by investing in education, training and empowerment of stakeholders and improving their access to essential operational and financial support services."

Indicators and Targets:

- Grow the share of value-chain stakeholders that have benefitted from advanced education, training, extensions and technical assistance programmes in each of the value-chain segments (primary production, processing, manufacturing and trade) to 50% by 2020;
- Offer at least one new operational service per year (2017–2020) to value-chain stakeholders to support production and trade functions essential for the industry's competitiveness (e.g. valuation service, auctioning or gemstone exchange service, testing and certification service, etc.);
- Grow the share of entrepreneurs and enterprises in the industrial segment of the VC (processing and manufacturing) that have accessed grants and loans for financing investments in infrastructure, equipment and technology to at least 25% by 2020.

Proposed Interventions:

Int. Num.	Intervention	Key Activities	Proposed Champion(s)
4.1	**Design and implementation of need-based training and advisory services**	• Conduct a training-needs assessment among Namibian stakeholders in the different VC segments and an appraisal of the advanced education, training (including VET) and advisory services currently available • Design new offers according to the assessment's findings (training contents, proposal on impact monitoring) and identify suitable service providers and modes of delivery • Implement new training, advanced education, extension and advisory service offers in fields like gemmology, jewellery and adornment design, prospection and exploration, extracting techniques, SHEQ, etc., in collaboration with academic institutions and other partners (NGOs, donors, etc.) • Monitor the impact of new programmes on client businesses and make adjustments if necessary	MITSMED
4.2	**Design and implementation of new operational services and service platforms**	• Prioritise operational service constraints together with industry stakeholders and identify sustainable solutions • Conduct brief feasibility, benchmarking and design studies on prioritised services (project profiles) • Support the service platform during pilot phase (e.g. establish a capacity enhancement centre to offer operational and extension services such as mining equipment, exploration, testing and laboratory equipment, valuation and short business appreciation courses; upgrade existing gemstone centres; launch gemstone laboratory or gemstone valuation service) • Monitor the impact of new operational services on client businesses and make adjustments if necessary	MITSMED, MME, ASSM and JASSONA
4.3	**Investment support programme**	• Conduct an assessment of investment constraints in the different VC segments (financial gap analysis) • Review current financial investment support schemes (loans and grants) • Discuss options for closing financing gaps in the VC with financial service providers and public support institutions • Implement the identified options and monitor their impact on investment in infrastructure, technology and equipment	MITSMED and MME

Intervention Area 5: Business Environment

Strategic Objective 5:

"Create an enabling environment for the growth of local processing and manufacturing activities and improve value-chain governance through better stakeholder coordination and cooperation."

Indicators and Targets:

- With stakeholder participation, review and subsequently simplify, streamline or decentralise at least one licencing, documentation or clearance procedure or other regulation in the value chain per year between 2017 and 2020;
- Grow the share of cooperatives and associations in the value chain that have received organisational (legal, strategic and/or operational) support and have been actively involved in the implementation of the industry growth strategy (at the strategy-steering or project execution level) to at least 80%;
- Increase the share of value-chain stakeholders that confirm in the annual public meetings that the industry growth strategy has been efficiently steered and operational plans have been effectively implemented to 80% of interviewed stakeholders by 2020.

Proposed Interventions:

Int. Num.	Intervention	Key Activities	Proposed Champion(s)
5.1	**Industry-wide PPD on regulatory framework conditions and administrative simplification initiatives**	• Organise regular (half-yearly) PPD meetings to discuss regulatory bottlenecks in the industry and VC (identifying problems and proposing solutions) • Simplify documentation and clearance procedures and publish export procedures and documentation to encourage compliance • Develop simplified and streamlined procedures for issuing mining licences and decentralise licence processing (pegging claims; environmental contract) • Review import/export duties to remove anomalies hindering industry growth	NTF (with MITSMED and MME); private-sector associations
5.2	**Support to private-sector associations and cooperatives**	• Appraise organisational weaknesses of associations and cooperatives in the value chain, with their participation • Formulate tailor-made organisational development plans • Provide ongoing advisory, mentoring and training for implementation and monitoring of organisational development plans	MITSMED and MME
5.3	**Support to setup and functioning of strategy steering committee and project-specific work groups**	• Establish a steering committee to ensure operational planning and follow up on strategy implementation process • Continuously support the implementation of operational plans (prioritised interventions) by industry growth facilitator	MITSMED

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