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STATUS OF SEMI- PRECIOUS STONES INDUSTRY IN RWANDA

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1. Introduction and context

This study forms part of the return-to-work programme after the Development Minerals workshop held in Maputo in April 2017 jointly organized by African Union and UNDP. Each participant was requested to design a project that he will carry out when he/she returns in his/her country. For this particular case, gemstones were chosen to be the focus of the study in Rwanda. Note that development minerals include four categories summarized as follows:

- Construction materials which include gravel, sand, clay, limestone, aggregates (crushed granites, etc).
- Industrial minerals which include gypsum, potash, salt, graphite, ceramics, bentonite, etc.
- Dimension stones including marble, granite, slate, sandstone, etc.
- Semi-precious stones including agate, amethyst, citrine, beryl, garnet, tourmaline, opal, etc.

This research purposely targeted on identification of all kinds of gemstones found in the area of survey for further gemstone projects and their promotion. Some conditions like surface rain/running water and longtime archaic mining system have been reported as contributing in obstructing/destroying completely some mine sites such that it can take long time to reach the veins.

2. Overview of the gem industry in Rwanda

Rwanda sits on the system of rock types known in the scientific circles as the Kibaran belt rocks. This belt is well known by geologists to be rich in minerals especially Cassiterite (Sn), Wolframite (W), Tantalite (Ta), Niobium (Nb), Gold (Au), and others. These minerals are largely associated with rocks called granites which occur in all the regions throughout all the country. Among key minerals currently being mined and traded in Rwanda, Cassiterite, Wolframite, Tantalite and Gold are well known by Rwandans and many investors are now exploring, exploiting and trading them. However, Rwanda possesses additional potential in minerals including Amblygonite, Beryl, Tourmaline, Topaz, Garnet, Amethyst, Opal, Agate and Sapphires. And other minerals could be found if proper exploration is carried out. As results of different meetings attended by high authorities of Rwanda, internationally known companies are coming in to exploit the huge potential in available minerals. One of the known companies to invest in precious stones is Sapphire Miners Cyangugu Ltd (SMC) from Thailand whose mother company is specialized in transforming gemstones products into end products.

3. Operators in Rwanda

Around 20 companies are trading gemstones in Rwanda exporting ten types of gemstones. However the number of individuals and companies/associations mining gems is not known because they often operate outside of the law. This raises an interest to conduct deeper research into mining and trading dynamics so that accurate data can be reported out. This shows the need to conduct deeper research to fully understand Rwanda's potential in this sector, as well as the current organization and estimated production of the gemstone sector. This study could potentially attract more investors.

Table 1: List of known companies exporting semi-precious stones in Rwanda

No	Company name
1	Pacogem Business Ltd
2	Socoura Gems Ltd
3	Hydro Africa Ltd
4	Faso Gems Ltd
5	Maya Gems Ltd
6	Africa Gemstones Ltd
7	Kaba Mohamed Ltd
8	Africa General Trading Ltd
9	Madina Gems Ltd
10	Family Gems Ltd
11	Fix Company Ltd
12	Kosmo Impex Ltd
13	African Company of Trade and Industry Ltd
14	Kerilee Minerals Investment Rwanda Ltd
15	Hibro Africa Gemstones International Ltd
16	DB Gems Ltd
17	Ets K. P. Ltd
18	Saxmark Ltd
19	J. R. Gems Expo Ltd

Source: Ministry of Natural Resources

Table 2: Official Gemstones exports by types - 2016

No	Types of gemstones	Quantity in kg	Average price in \$	Amount in \$
1	Spodumene	21,000.00	0.35	7,350.00
2	Tourmaline	4,629.30	40	185,172.00
3	Amethyst	1,733.35	50	86,667.50
4	Topaz	1,119.00	20	22,380.00
5	Sapphire	12.77	200	2,554.00
6	Quartz	261.28	4	1,045.12
7	Aquamarine	90.20	30	2,706.00
8	Amblygonite	10.00	49.6	496.00
9	Apatite	1.30	39.95	51.94
10	Beryl	28,857.20	0.4	11,542.88

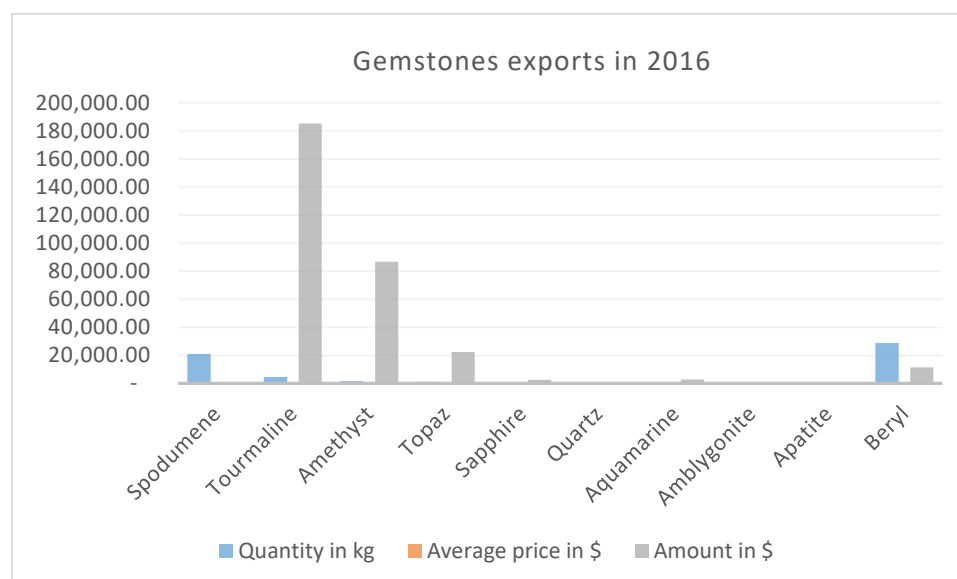
Source: Ministry of Natural Resources

Table 3: Cumulative official exports in three past years

	2014	2015	2016
Exports in kg	5,958,850	6,708,261	6,572,417
Value in \$ US	8,110,694	31,275,751	80,057,524

Source: Ministry of Natural Resources

Figure 1: Gemstones exports done in 2016

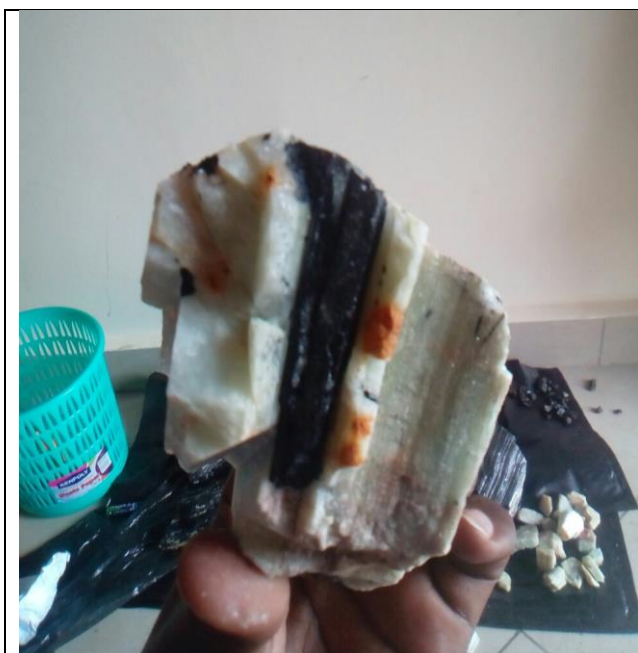


The above charts indicate that tourmaline was the gemstone type generating the most income for the country with more than \$185,000 followed by amethyst with \$86,000; topaz with \$22,000 and beryl with \$11,000 in 2016. More investigation will be required to know the reason of this sequence so that the market can be understood better; for example, are tourmalines simply traded within official channels more than others (such as sapphire), are Rwandan tourmalines particularly high value compared to other gems (due to their color, clarity, or other internal qualities), or are they simply mined more frequently?

Gemstones value for the Rwandan economy has not been properly estimated and valued; the larger mining community have been mainly interested by only 3Ts minerals including Tin, Tantalite and Tungsten ("3Ts"). This will require more sensitization about the importance of the minerals in the economy of the country but also in the livelihoods of diggers or mining companies or associations involved. This stated, raised awareness could also lead to greater everyday security concerns for those who mine or trade gems as increased sensitization could lead to increased threat of robbery.

4. Importance of the semi-precious stones in Rwanda

The mining sector plays an important role in the country's economic development, based on its position in generating revenues from exports. Some associations settle in place to cut and polish semi-precious



Rwandan tourmalines range from greens dark greens (almost appearing black)

stones in Rwanda. These are used in jewelry and other adornments like necklaces, rings, bangles, bracelets, fashion accessories, decoration of different items. For the moment, there is no data available on individuals, companies or associations involved in jewelry making/ production.

Gemstone mining, processing and selling is a relatively new industry with very few Rwandan specialists and establishments involved in its promotion. The Government of Rwanda intends to promote Gemstone extraction through establishment of value addition processes.

5. Available exploration data

From the study done by BRGM “Bureau de Recherches Geologiques et Minières” in 1987, different occurrences on semi-precious stones were identified in the country. This seems to be the only one report on these minerals. The report needs to be further updated. According to the information collected from the Ministry of Natural Resources, another detailed airborne survey is being carried out by the Government. This study would be the response on the update of the mineral map of Rwanda and therefore the optimization of the gemstones occurrences.

Table 4: Occurrences of semi-precious stones by BRGM (as of 1987)

No	Name of the place	Type of mineral	Coordinates		District	Sector
			X	Y		
1	Sebeya	Beryl	29°17'00"	01°42'00"	Rubavu	Nyamyumba
2	Kitsimbi	Beryl	29°15'00"	01°43'00"	Rubavu	Nyamyumba
3	Busoro	Beryl	29°14'00"	01°46'00"	Rubavu	Nyamyumba
4	Burusha	Beryl	29°18'00"	01°45'00"	Rubavu	Nyamyumba
5	Kindoyi	Beryl	29°21'00"	01°51'00"	Rutsiro	Kayove
6	Rukanka	Beryl	29°24'00"	01°59'00"	Karongi	Mabanza
7	Kiruri	Beryl	29°24'00"	02°00'00"	Karongi	
8	Masongati	Beryl	29°24'00"	01°48'00"	Rubavu	Kanama
9	Nyamukongoro	Topaz	29°29'00"	01°39'00"	Rubavu	Nkuli
10	Gihira	Topaz	29°32'00"	01°42'00"	Rubavu	Karago
11	Buranga	Beryl	29°39'00"	01°55'00"	Rubavu	Kibirira
12	Rongi 1	Amblygonite	29°40'00"	01°56'00"	Rubavu	Kibirira
13	Ruvugu	Beryl	29°41'00"	01°54'00"	Muhanga	Nyakabanda
14	Remera	Beryl	29°41'00"	01°54'00"	Muhanga	Nyakabanda

15	Rusesamvuze	Beryl	29°39'00"	01°55'00"	Rubavu	Kibirira
16	Kavumu	Beryl	29°37'00"	01°56'00"	Rubavu	Kibirira
17	Gakumba	Beryl	29°37'00"	01°56'00"	Rubavu	Kibirira
18	Kazirabageni	Amethyst	29°37'00"	01°58'00"	Rubavu	Kibirira
19	Nyabitare	Beryl	29°39'00"	02°02'00"	Muhanga	Bulinga
20	Gatare	Beryl	29°39'00"	02°05'00"	Muhanga	Mushubati
21	Remera	Beryl	29°39'00"	02°00'00"	Muhanga	Mushubati
22	Bukina	Beryl	29°44'00"	02°06'00"	Muhanga	Mushubati
23	Kiryango	Beryl	29°39'00"	02°07'00"	Muhanga	Mushubati
24	Muyunzwe	Amethyst	29°40'00"	02°11'00"	Muhanga	Masango
25	Muhoza	Beryl	29°39'00"	02°14'00"	Muhanga	Masango
26	Kamiranzovu	Tourmaline	29°09'00"	02°28'00"	Nyamasheke	Kagano
27	Mwogo river 7	Sapphire	29°04'00"	02°27'00"	Nyamasheke	Kagano
28	Matyazo	Topaz	29°04'00"	02°29'00"	Nyamasheke	Karengera
29	Karamba	Amethyst	29°07'00"	02°28'00"	Nyamasheke	Kagano
30	Katasoma	Monazite	29°29'00"	02°24'00"	Nyamagabe	Musebeya
31	Punga	Monazite	29°27'00"	02°24'00"	Nyamagabe	Musebeya
32	Burangora	Monazite	29°25'00"	02°24'00"	Nyamagabe	Musebeya
33	Karundura	Monazite	29°18'00"	02°23'00"	Nyamasheke	Kirambo
34	Bukindu	Monazite	29°35'00"	01°48'00"	Rubavu	Satinsyi
35	Hindiro	Monazite	29°37'00"	01°48'00"	Rubavu	Satinsyi
36	Baza	Topaz	29°35'00"	01°42'00"	Rubavu	Giciye
37	Uwinyana	Zircon, Topaz	29°28'00"	02°46'00"	Nyamagabe	Nshili
38	Shororo	Monazite	29°31'00"	02°44'00"	Nyamagabe	Nshili
39	Akavuguto	Monazite, Garnet, Zircon	29°38'00"	02°39'00"	Nyamagabe	Mubuga
40	Akagezi	Monazite	29°39'00"	02°39'00"	Huye	Nyakizu
41	Akagogo	Monazite	29°39'00"	02°39'00"	Huye	Nyakizu
42	Agasumo	Monazite	29°36'08"	02°40'01"	Huye	Nyakizu
43	Kawamba	Monazite	29°58'00"	02°21'00"	Muhanga	Nyabikenke
44	Rusiga	Monazite	29°59'00"	02°20'00"	Kigali	Shyorongi
45	Biniga	Monazite	29°55'00"	02°19'00"	Kigali	Mbogo
46	Gisozi	Monazite	29°53'00"	02°16'00"	Kigali	Rushashi
47	Kibingo	Monazite	29°47'00"	02°11'00"	Musanze	Nyarutovu
48	Kiruta	Monazite	29°41'00"	02°09'00"	Musanze	Nyarutovu

Source: BRGM report, Plan Mineral, 1987

6. Findings from field visits

Three field visits were carried out to companies mining and trading gems in Rwanda.

a. Fix Company Ltd

A meeting was organized with the representative for Fix Company Ltd, Mr. Faustin Murigo on 7 June 2017. With one year of experience in trading gems in Rwanda, Fix Company has a trading license issued by the Ministry of Commerce. The company's main focus is amethyst. The company is buying gemstones (amethyst, sapphire) from the population carrying out mining in the lands of local people. Faustin confirmed that there is a lot of potential in the country and people are coming from China and India to buy the materials themselves.

The government is only facilitating in the issuance of the trading license and the certificate of origin during exports. However no any other financial support from the government.

During the discussion with the company the following challenges were mentioned: the lack of a stable market and the lack of value added – minerals are sold rough, with a lower value associated to them. Moreover, the miners have poor washing systems and rudimentary tools, limited finances and skills where the country lacks gemologists specialized in cutting and polishing. Rwanda is not a prestigious or well-known gemstone country and therefore its stones are not as highly valued on the international market.

b. Rwanda Mining Africa Central (RMAC) Ltd

The company was visited on 8 June 2017 in Ngororero district, Kavumu sector, Tetero cell where they are mining amethyst. The company has exploration license for four years which is expiring this month. They are preparing their exploration report which will be submitted to the Ministry of Natural Resources so that they can get their exploitation license. The license covers 3T minerals but also amethyst.

The owner, who is passionate for gemstones, Mr. Francois Ntabwoba, has a long experience in the sector, as he started working on gemstones since 1997 in Nyamasheke district, located in the south west of Rwanda. He commented that: 'At that time we were selling the amethyst in Nairobi at \$US 200 per kg'. He has machines to cut and polish gems at his home which can help him to improve the value of his stones. These machines were operated by Indians who are specialized in stone cutting and polishing. However the processing was stopped due to the multiple thefts by those Indians who were employed.

Mr. Francois has been always selling his gems to buyers from Germany, Canada and Brazil between 1998 and 2004. At that time Mr. Francois and other colleagues were illegally mining sapphire, tourmaline, aquamarine and beryl from the south western part of the country. After that period he worked with other companies like Ets Mbanzabugabo Ltd, Copexmi Ltd before he opened his own businesses and applied for the license.

Currently Mr. Francois needs investment for mining and reach additional amethyst deposits. He has an exploration plan which gives him more confidence that he will reach higher quality deposits of amethyst shortly. He has a gemologist who will help him using the cutting and polishing equipment but also to train locals. He is able to make necklaces and other products for local sales and sales to tourists. The necessary

equipment can cost around \$US 25,000. However some of them can be made locally importing few parts. He states that the market/demand is high in the region but also worldwide.

They are not benefiting any support from the government.

The vein his company is mining is very long and; according to the exploration done in the country, it goes from North West to South West crossing Burundi and DRC through Congo Nile Crete. This vein needs more exploration studies but can be of good resource for the country.



Photo 1: The owner of the site (second) and amethyst crystals from the tunnel

c. Mining Powerful Ltd

The company visited on 09 June 2017, operates in Ruhango district, Kinihira sector, Rukina cell since 2008. The testimony by an older man met on site, Mr. Didace Mulindankaka, 68 years old and who worked in that quarry in 1982; indicates that the mining of amethyst started in 1982 by white miners. At that time Mr. Didace and his coworkers were working for Mr. Dayel from Belgium but exporting gems to Germany. During that time they were using jackhammers and explosives through protected tunnels of around 120m

long and he could be paid Rwf 650 (less than \$US 1) per day. Mr. Didace thinks that amethyst has more value nowadays than before.

During the visit, it was found that the vein is worked by 6 people after the work done by an excavator machine which had opened the tunnel to more easily access the amethyst vein. It seemed that they are lacking proper equipment to mine the gems but also lack some organization and mining techniques. Blue amethysts seemed to be damaged even though they are of good quality. Around 50 miners can be present in the quarry when the market is good.

Following issues were raised among the challenges by miners met on ground:

- Lack of the life insurance which can help them in case of accident;
- Lack of salary due to the lack of markets which discourages miners who leave the mine for other income-generating jobs;
- Lack of good exploitation techniques;
- Carelessness by the owner.

Looking at the mine area, the vein has a lot of potential. It is 2 meters thick and extends more than 5 km from east to west. Miners say that they know the quality of the materials but do not know how they are traded. Piles of amethysts were found on place covered by grasses to fight against sun which can deteriorate the colors and their quality. A truck is used to transport the stones when there are enough. Miners are paid Rwf 200,000 (~\$US 240) per truck of 7 tonnes of amethysts. The expropriation (payment to landowners) is done before opening a new place. *Miners confirmed that they know where to find stones and the quality of gems they need.* This mine seems to be promising in terms of resources and the quality of gems.



Photo 2: Miners and the trend of the amethyst vein at Rukina site



Photo 3: Amethyst crystals at Rukina site

7. Way forward and recommendations

Operators involved in the business lack equipment for cutting and polishing the semi-precious stones. Raising this need towards different donors and the government should be of high priority in terms of promoting domestic beneficiation.

Added value to minerals is needed; the minerals are sold without ever working on them which gives low price to the miners and this can't improve their livelihoods. To overcome this challenge, following two objectives on capacity development can be set:

- *Capacity development for companies*

They have limited knowledge in their profession. Therefore capacity building is highly needed to upgrade their skills so that the work can be better organized in the mining methods and profitable overall. This will need to hire specialists including mining engineers, cutting specialists, and gemmologists who can conduct trainings in mining/processing technologies, basic and international-level cutting and polishing skills, and gem evaluation, respectively. In Rwanda, gemstone miners are not skilled to understand the processes of gemstone sorting, grading, sorting, cutting or polishing, valuation and marketing and consequently losing considerable value in their material by not finding reliable, consistent markets. The Government intends to support this sub sector to realise its full potential and contribute to the national income basket. This will ultimately lead to evolvement of value addition industries in gemstones.

- *Capacity development for the Ministry*

The project will focus on helping the government side in better knowing and supporting the strategic development sector, and how the business should be organized so that they mostly benefit from it. This sector falls under the government vision to diversify its mining sector beyond 3T minerals. The next phases of the project shall deal with the quality and quantity of gemstones. The government decision makers could provide gemstone laboratory and related useful materials and way to keep and document the found rough and treated gemstone samples, organize a training academy for cutting & polishing expertise in Rwanda, and lead efforts to market and brand Rwandan gemstones internationally as this leads to greater awareness and prices for stones.

8. Proposed plan and budget

The initial work is far to be completed due to budget constraints. In order to accurately report on the available resources and help the country in the promotion of gemstones, following main activities can be proposed for the next steps. The required budget and related activities which can contribute to the promotion of the industry are summarized in the table below.

Table 5: Simplified budgeted activities and timeline

Activity	Year 1	Year 2	Year 3	Estimated budget (\$US)
Mapping and essential profiling of mining sites				20,000
Mapping and profiling of associations/cooperatives/individuals/companies involved in gemstones				15,000
Meeting with Rwandan stakeholders in gemstones, government (for coordination)				5,000

Developing and designing training materials (utilizing international talent if necessary to build off specialized gem expertise)				100,000
Setting up one pilot processing equipment and training center (includes building rent, student equipment, center business plan, equipment maintenance budget, pilot loan program fund)				100,000
Training of associations/cooperatives/individuals/companies (includes travel to mine sites, material distribution, trainers' costs)				100,000
Training of gems cutters, traders				100,000
Exposure visit to Arusha Gem Show for 10 individuals for marketing learning				35,000
Coordination of government-led marketing plan (budget for marketing should come from government allocations)				
Hire mining engineer to train on the exploitation techniques				50,000
Hire a gemologist to train locals				50,000
Ongoing facilitation, focused meetings, follow up visits				10,000
Evaluation of first training class (determine if key indicators (increased production, beneficiation, sales) have been achieved)				10,000
Total				595,000