

SUMMARIZED REPORT ON MINERALS IN UGANDA

Introduction

This research indicates minerals which include metallic ores, industrial minerals and non-metallic minerals. It also includes Potential mineral type of mineral, its occurrence/location, its mining history if any, the current activities and the size of the reserves. The available skills, the map of the mineral occurrences (Appendix I), the objectives of the Mineral Policy of Uganda, the use of the Mining Act as well as a list of references consulted.

1.1 Minerals of Uganda

- According to MEMD (2003), in 1960s to 1970 Uganda mineral exports contributed 30% of foreign exchange
- Political and economic instability in the 1970s led to the decline up to 1% of (GDP)
- Uganda Government undertook investment with the French Government (1989-1990) and the United Nations Development Programme, UNDP (1992-1996), leading to mineral appraisal and more discovery and process for instance cobalt in Kasese, gold at Tira in Busia, tungsten/wolfram at Nyamuliro in Kabale, tantalite at Wampewo in Wakiso, gold near Kyakidu in Mubende and vermiculite at Namekhara in Mbale.

The objectives of the Mineral Policy 2001,

- Ensure mineral resources contribute to overall development of the country.
- Stimulate sector development by promoting private sector participation.
- Minimize and mitigate the adverse social and environment impacts of mineral exploitation.
- Develop local capacity for mineral development and management.
- Regularize and improve artisanal and small scale mining.
- Remove restrictive practices on women participation and protect children against mining hazards.
- Encourage value addition and mineral trade.

Government obligation

1. Under the policy framework, Government shall carry out geological, geochemical and geophysical surveys of the entire country at various scales; process, analyses and interpret the geoscientific data; archive, package and disseminate the data to potential users through print

and electronic media; oblige private operators in the sector to provide acquired geoscientific data at appropriate stage of exploration for enhancing the National Geoscientific Data Bank; and avail mineral prospects to investors.

2. To encourage artisanal and small-scale miners to form associations and other organizations in order to improve capacity to produce and market their mineral commodities through light-handed regulations, awareness campaigns and maintenance of continuous dialogue with miners.
3. To put in place an investor-friendly and competitive legal and fiscal framework, with well-defined parameters for the sector this will enhance investment in the mineral sector.

Note: These are other related Acts like; The Mining Act, 2003 and The Mining Regulations, 2004, The Land Act 1998 and 2010, The Land Regulations Act 2004, Registration of Titles Act 2000, The National Environment Act 2003, Contracts Act 2000, and The Arbitration and Conciliation Act 2000.

Keynotes in the Mining Act, 2003:

- Ownership of minerals is vested in the Government.
- Mineral licenses/rights include: Prospecting License, Exploration License, Retention License, Mining Lease, Location License, Mineral Dealers License, and Goldsmith License.
- Mineral Agreements may be executed for large-scale projects.
- Separation of powers: Administration of the Act *vis a vi* Arbitration of disputes.
- Royalties on gross value: Precious stones (5%), precious and base metals (3%), industrial minerals (quantity-based).
- Revenues from royalties shared by: Government, local governments and land owner (80%:17%:3%).
- Operations to comply with National Environment Management Act.
- Settlement of disputes: may appeal against any administrative decision.
- Minister to intervene prior to complainant proceeding to courts of Law.
- International arbitration or sole expert.

Note: The Mining Regulations was to operationalize the Mining Act. They contain procedures/application forms for acquiring various licenses. Applications for these licenses are made to the Commissioner, GSMD and in some instances through the Office of Chief Administrative Officer at the district.

Energy Resources (Fuels)

The energy resources currently being explored in Uganda are petroleum and geothermal energy. Production of oil and gas is expected soon and the development of geothermal energy is still in its infancy.

MINERAL OCCURRENCES IN UGANDA

This section describes the major minerals that were mined in the past and/or are being mined at present or are known to occur in various parts of the country.

SUMMARIZED MAJOR MINERAL IN UGANDA

Type	Minerals	Description	Location	Discovered	Estimated Amounts
Metallic	Beryl	Occurs in Acid with biscuit, off-white, yellow in tint and brown color White, semi-transparent.	Mbarara, Ntungamo (Kazumu), Bushenyi (Mutaka), Kanungu (Bulema and Ishasha) and Rukungiri districts. Also occurs at Mbale Estate in Mubende, Lunya in Mukono and some indications in Karamoja	Late 1930s and 1950s	By 1960s, beryl accounted for 10% of world production. Currently, reserves in are estimated at 100, 000 tons
	Bismuth	Bismuth is found in Uganda as bismutite ($\text{Bi}_2\text{O}_3 \cdot \text{CO}_2 \cdot \text{H}_2\text{O}$) which is not a common ore. It is highly oxidized ferruginous veins and bodies together with small amounts of native bismuth, gold, wolframite/tungsten and other minerals	Rwanzu and Kitwa in Kisoro, Kitahulira in Kabale, and Muramba in Kanungu district	First exported 1948 to 1960.	Only the Rwanzu deposit has been mined in the past. The mineral was recovered mainly by hand picking and panning and 48.1 tons were exported from 1948-1960. However, the reserves are not known.
	Columbite-Tantalite	Recovered as a by-product of beryl.	Kakanena, Nyanga, Rwakirenzi, Nyabushenyi, Rwenkanga and Dwata in		Reserves of pyrochlore-bearing soils in the three valleys at

	(Niobium-Tantalum)	<p>Columbite and tantalite constitute an isomorphous columbite</p> <p>Tantalite is the chief ore of tantalum and occurs with columbite in pegmatites. Microlite (up to 70% Ta₂O₅ and 4% U₃O₈)</p>	<p>Ntungamo, Jemubi and Kabira in Bushenyi, Bulema in Kanungu and Kihimbi in Kisoro district with up to 83% Ta₂O₅ and 70% Nb₂O₅. Others are Ngoma-Kazumo in the west, Wampewo (bismutotantalite) in Wakiso and Lunya in Mukono district. at Sukulu in Tororo, Bukusu in Manafwa, as well as Napak and Toror in Karamoja. Sukulu is the most important and pyrochlore occurs in residual soils resulting from the erosion of the carbonatite.</p>		<p>Sukulu are 202 million tons of which 130 million tons average 0.2% Nb₂O₅. Concentration is complicated by its fine size with up to 45% less than 10 microns.</p>
	Copper-cobalt	<p>Apart from cobalt, the ore is also associated with nickel and gold and sometimes kaolin.</p> <p>The thickness of the ore is variable and averages roughly 6m (20 ft) although in the split ore bodies of the northern deposit the total mineralized zone is often more than twice this width</p>	<p>Kilembe, in Kasese Bobong, Lokapelieth and Loyolo in Karamoja region, and Kampono and Kitaka in Mbarara district and in Buhweju.</p>	1956	<p>Between 1957 and 1979 a total of 16.29 million tons of ore averaging 1.95% Cu and 0.18% Co were mined and treated to 217,000 tons of blister copper which was exported.</p> <p>By 2003, 5.5 million tons of the cobalt tailings at an average grade 0.114% Co were left.</p>
	Gold		<p>Found in Buhweju and Mashonga in Buhweju district, Kyamuhunga in Bushenyi district (Buhweju goldfield), Kabale, Kisoro and Kanungu districts (Kigezi goldfield), Tira and Amonikakine in Busia district (Busia-Bugiri gold field), Kamalenge in Mubende district</p>	1931 Was also First reported in gravels of River Kalere near Kaabong in	<p>Between 1931 and 2001 were around 6.5 tons of which the largest came from Buhweju followed by Tira.</p>

		(Mubende-Kiboga gold field) and many localities in Karamoja region (Karamoja goldfield).	1960	
Lead-Zinc ores	Galena (lead with minor zinc and gold)	Kitomi forest at Kampono, Kanyambogo and Kitaka in Mbarara district with Kitaka having the largest reserve. Mubende, Mukono, Ntungamo, Kabale, Kanungu and Rukungiri districts Nyabushenyi (Ntungamo) and Mbale estate (Mubende)	1947	Totaled only 750 tons from 1947 to 1960 but the reserves are unknown.
Lithium	Mainly amblygonite and Zinnwaldite but minor amounts. These minerals are of petalite and lepidolite	Kabale		1949-1969 was only 777 tons.
Tin (cassiterite)	Mainly of quartz-mica-cassiterite vein type in shales and sandstones of K-A System. The individual veins are thin (rarely more than a metre wide) and irregular. At Kikagati and Ndaniankoko pale grey masses are mixed with darker varieties. Bright red resinous cassiterite and black wood tin occur at Kaina with some commonly having various shades of brown.	Rwaminyinya (Kisoro) and Kitezo (Mbarara) The largest deposit was Mwerasandu (Ntungamo) and substantial production also came from Kikagati (Isingiro). Other producers were Rwaminyinya, Burama ridge (Kabale/Ntungamo border), Ndaniyankoko (Isingiro), Kaina and Nyinamaherere (Ntungamo). Over one million tons are found at Kikagati and Mwerasandu alone.	1927	Uganda's tin concentrate production from 1927 to 2001 totaled about 13000 tons.

	Tungsten (wolframite/scheelite)	They occur as vein swarms in graphitic horizons in the phyllitic rocks of K-A System closely associated with granitoid intrusions. Tungsten occurs mainly as ferberite frequently as reinite pseudomorphs after scheelite.	Found in Several places in south west Uganda and in Mubende. Nyamuliro (Bjordal Mine), Kirwa, Ruhija, Mutolere, Rwamanyinya and Bahati in Kabale and Kisoro districts		1935 to 2001 has totaled over 5000 tons.
Industrial minerals and non-metallic minerals	Sand	Coarse, clay-free sands are usually available in river courses often with gravel.	found close to the lakes		
	Glass sand (silica sand)	The highest quality (99.95% SiO ₂) glass sands have been mined from Kome Islands for export in the past.	Diimu in Rakai, Bukakata and Lwera in Masaka, Nalumuli Bay and Nyimu Bay in Mukono and Kome Islands in Buvuma.	1960	At Diimu and Bukakata beaches, over 2 million tons of good quality sands (99.93% SiO ₂ and 0.05% Fe ₂ O ₃) have been delineated. Total reserves are up to 100 million tons.
	Aggregate, crushed and Dimension Stone	Granite, gneiss, quartzite and sandstone are widely distributed throughout the areas of Precambrian Basement. Its beautiful coloured rocks mostly granite, gneiss, marble, and	Moroto district		

	gabbro are used in the dimension stone industry as decorative tiles and blocks.			
Carbonatites	Volcanic lavas and agglomerates. carbonate rocks of volcanic origin	They occur at Sukulu and Tororo in Tororo district, at Napak in Moroto and Toror in Kotido district.	1953	the reserves are estimated to be over 25 million tons
Limestone	May be high in phosphorous and high proportion of magnetite. They vary in type from calcretes, tufas and sinters at Muhokya and Dura to a true lake limestone at Hima.	found in the Lake George Basin about 100 ft (30.5m) Tororo and Moroto	1953	Hima limestone deposit- current developer indicated about 18-20 million tons of reserves. Muhokya limestone deposit- Dura limestone deposit- estimated 1-2 million tons of good quality travertine that remain.
Marbles	The marble is usually high in magnesia occur associated with Basement Complex	Mt. Moroto and pink marble near Moroto town. And some parts of Karamoja and Moyo. Tororo		
Mica	Mica occurs in Muscovite and little phlogpite	Kampala, Arua, at Morulem in Abim district, Lunya in Mukono, Omwodulum in Lira and Paimol, Parobong, Kacharalum, Agili, Akwanga, Achumo, Kukor, Labwordwong, Namokora, Naam and Okora in Pader district.	1940	In Kampala at Munyonyo high-grade ruby mica is found

Others minerals include

- **Phosphates** - Found in Bukusu and at Sukulu and used to manufacture phosphate fertilizers and making other commercial fertilizers for Agriculture. Discovered in 1953
- **Quartz crystal found** – found at Kitaka lead mine in Mbarara.
- **Salt** - found at Kibiro in Hoima district and on a larger scale from the floor of crater lakes Katwe and Kasenyi in Kasese district for centuries. The salt is a mixture of sodium and potassium chlorides with less amounts of sulphate (gypsum).
- **Clay** - Kampala, Jinja, Entebbe, Mbarara, Masaka and Budaka
- **Kaolin** - About 64000 tons of good materials for ceramics have been estimated for Namasera kaolin. Rakai and Namasera deposits were formed by alteration of shales whereas Mutaka, Buwambo and Migade formed from altered/kaolinised granitoids. Other occurrences are in Luwero and Gombe in Mpigi district.
- **Vermiculit - Occurs** at Sukulu and Bukusu alkaline volcanic centres in Eastern Uganda. Currently mining and processing vermiculite with a planned output of 40000 tons/year mainly for export.
- **Gypsum** found near Kibuku in Bundibugyo and at Lake Mburo in Kiruhura district
- **Pozzolana** - found in the Western Rift valley and the Eastern Uganda. In the west the materials occur in the Fort Portal volcanic field and Ndale volcanic field (Kabarole), Bunyaruguru volcanic field (Bushenyi) and Kabale-Kisoro volcanic field.
- **Asbestos**-Occurs in small quantities in several parts of Uganda and is of the anthophyllite or tremolite variety for which there is little demand.

POTENTIAL MINERAL DEPOSITS

Metallic ores include

- **Iron Ore** - Muko in Kabale and Kisoro
- **Magnesite** - Lolukei at the Karamoja-South Sudan border
- **Manganese** - found in Isandara, Gulika, Kirongo and Gweitengya in western region.
- **Nickel** at Kasese. The proven reserve is 1.1 million tonnes at 0.4 are favorable for hosting nickel and cobalt at Kafunjo in Ntungamo district and Rugaga in Mbarara district close to the border with Tanzania.
- **Platinum Group Minerals** - Nakiloro (Moroto) and Lolung. Traces of platinum have also been found in the small alluvial gold gravels of the Kafu River.
- **Chromite** -It is found about 6 km long north of Mt. Moroto at Nakiloro and Lolung.

Radioactive minerals

➤ **Uranium** - Geophysical interpretation of data from recent Uganda Aerial Mineral Survey of the country identified uranium mineralization in a 2882 km² land owned by IBI Company which is prospecting for uranium. More than 30 anomalies have been identified in Mubende area. With rising values of uranium, it is expected that the demand for uranium nuclear power generation will continue to rise. Investors with technical and financial capability can work with IBI.

➤ **Thorium** It occurs at Kalapata and Kalere river valley in quartz-rutile-ilmenite nodules in biotite gneiss.

Potential Industrial minerals and non-metals

➤ **Barites** at Katoma hill in Bushenyi in a pegmatite, at Lolachat River in Karamoja as veinlets in brecciated gneiss, and in recoverable quantities at Mugabuzi hill in Kanungu district

➤ **Corundum** - in Karamoja, but so far no workable deposits have been found.

➤ **Diamonds** - It is also found in small amounts in Kabale and Butale.

➤ **Diatomite** - found in West Nile at Panyango, Alui and Atar near Packwach town as well as on the Ambos River. At Panyango, up to 100 m of almost horizontal Quaternary deposits crop out along the west bank of the Albert Nile.

➤ **Feldspar** - It occurs at Bulema (Kanungu), Bugangari (Rukungiri), Mutaka (Bushenyi), Nyabakweri (Ntungamo), and Lunya (Mukono).

➤ **Topaz**- at Lunya and half a ton was recovered during beryl mining. It also occurs as a minor accessory mineral at Mpuywi in Mubende district.

➤ **Garnet** - in Karamoja derived from the weathering of garnet gneiss.

➤ **Graphite** - West Nile at Zeu in Nebbi district. It is also found in Matidi and Acholibur in Kitgum district. The tributary valley of the Mobuku river in the Ruwenzori mountains

➤ **Kyanite** - in Acholi, West Nile, Kabale, at Ihunga and Kamirambuzi hills in Rukungiri district and near Murchison Falls in Masindi.

➤ **Potash** - on the DRC border in Kanungu district and in Hoima district.

➤ **Talc** - found in at Kisinga in Kasese, Tega-Manengo and Kyamuhunga in Bushenyi and Lolung-Moruamakale in Moroto. Soapstone also occurs at Zeu hills in West Nile.

➤ **Zircon** - Sukulu carbonatite Moroto town and on the Kalere River in Karamoja.

➤ **Bentonite** - Mt. Elgon in the East and in the Western Rift valley north of Butiaba.

➤ **Precious stone** - found Karamoja.

ENERGY RESOURCES

Geothermal Energy Potential

➤ It was estimated at 450 MW in 1982. found in Katwe, Buranga and Kibiro located in Kasese, Bundibugyo and Hoima districts respectively.

➤ **Petroleum**

It has been intermittent since the 1920s but in 2006, oil was discovered near Lake Albert along the border between Uganda and the Democratic Republic of Congo (DRC) .Uganda confirmed oil reserves to two billion barrels of which over 800 million are expected to be recovered.