BGR – German Federal Agency for Geosciences and Natural Resources

Project Summary

In 2006, the German government through the Federal Institute for Geosciences and Natural Resources (BGR) took on a UN proposal to track coltan and other minerals from the Democratic Republic of the Congo (DRC.) Their research had two tracks: to test the feasibility of 'fingerprinting' coltan samples based on mineralogical characteristics; to develop a chain of custody assurance system based on the establishment of transparent, traceable, and ethical trading chains.

Project Description

In 2006, the German government through the Federal Institute for Geosciences and Natural Resources (BGR) took on a UN proposal to track coltan and other minerals from the Democratic Republic of the Congo (DRC.) Their research had two tracks: to test the feasibility of 'fingerprinting' coltan samples based on mineralogical characteristics; to develop a chain of custody assurance system based on the establishment of transparent, traceable, and ethical trading chains. This concept of Certified Trading Chains (CTC) found entry to the G8 summit in Heiligendamm in 2007. The summit declaration expressed support for "a pilot study… concerning the feasibility of a designed certification system for selected raw materials" (article 86.)

BGR approached the first task through examination of the mineral and chemical variability of specific tantalum ores. Although initial results indicated that such an analytical proof of origin is possible, the processes are very demanding in terms of cost, time, and the required skills of laboratory personnel. Their testing confirmed the presence of identifiable regional and local variations in the composition of coltan, due to differences in mineralogical, chemical, and isotopic composition of the ore minerals. According to BGR, this allows distinction of locations even in districts and provinces of similar geological ages, similar host rocks or similar parent melt compositions. Each tantalum deposit has its unique characteristics. Therefore, a fingerprint of samples of suspect or unknown origin should be possible when a large and high-quality analytical data base is available.

The second phase of the project (2008-2009) aimed at simplifying and rationalizing the method and at increasing the reference data base. As a result, a technique is now available that allows for the analysis of ore concentrates in a shorter time. The analysis requires the use of a scanning electron microscope and a laser ablation-ICP-mass spectrometer. Data needed to fully characterize a concentrate can be acquired within a few hours. Sample preparation, measurement, and data processing can be completed within two to three days. This allows for an estimated capacity of up to 1000 samples per year in a properly equipped laboratory. At present, BGR is developing methods to fingerprint the origin of tin (cassiterite) and tungsten (wolframite) ore concentrates using the same instrumentation.

The second task BGR undertook was to develop a chain of custody assurance system (certified trading chains - CTC), based on the establishment of transparent, traceable, and ethical trading chains. Key features would include:

- A focus on industrial commodities (coltan, tin, tungsten)
- Direct linkages between business partners (producer and industrial consumer, as far as possible)
- Certification of specific mine sites by third party audit
- The introduction of minimum standards (based on OECD guidelines) on the origin and Corporate Social Responsibility (CSR) through voluntary certification
- Implementation of the CTC on a regional and multinational level.

The pilot project on CTC has been started in Rwanda within the framework of a technical co-operation programme to strengthen the competitiveness of the Rwandan mineral sector by developing best practice and enhancing transparency. It is implemented in cooperation with the Office de la Géologie et des Mines du Rwanda (OGMR) and private mining and processing companies. A workshop with stakeholders from government institutions and the mining industry started implementation in March 2009.The pilot program's goal is to clarify all the necessary steps in establishing a transparent, fair, and sustainable raw materials industry, specifically for conflict regions, and test its implementation. The companies and their mine sites in Rwanda are assessed according to five principles (including 20 standards) related to transparency of the trading chain and finance (transparency of payment according to international standards such as EITI), health, safety and environment. Similar to the Kimberley Process, the critical piece of these trading chains is the certificate of origin, which includes an appraisal based on plausibility checks of the documentary system as well as the trading volume. The fingerprinting method is incorporated as a possible additional checking instrument in case of doubt. The audit by an internationally accredited auditor is key to ensure compliance with the guidelines. The goal of this pilot is to create lessons learned for a certification system for metallic ores as well as for gold to be established in DRC as well as on a regional scale. As a next step, technical cooperation between BGR and the Congolese Ministry of Mines with the aim of introducing a certification system for coltan, cassiterite, wolframite and gold has been started in 2009. The cooperation will combine pilot implementation of CTC (with a focus on transparency of origin and finance) at selected mining sites in South Kivu with capacity building of sector institutions so that they can fulfill their mining oversight function.

The International Conference on the Great Lakes Region's (ICGLR) signed the Protocol against the Illegal Exploitation of Natural Resources, which includes implementing a mechanism for the certification of natural resources in its Article 11. The lessons learned of the CTC are brought to the ICGLR by Rwanda as a contribution to the development of a regional certification mechanism.

Nature of Supply Chain, Products and Issues

Large-scale industrial sources are typically highly formalized, mechanized, technologically advanced, and capital-intensive. While these sources are therefore relatively easy to identify, metals generally lose track-ability as they move through processing and into the economy. This "loss" can occur in the refining process, in the marketplace (as metals are traded or exchanged), and/or in the manufacturing process as metals are combined or become parts of components or subcomponents of products utilized in consumer products, industrial processes or construction.

Coltan is comprised of columbite-tantalite ore, from which niobium and tantalum are extracted. Tantalum is used in the production of capacitors, which in turn are used in a wide variety of consumer electronic products from pacemakers to automobile anti-lock braking systems, but more notably in computers, cameras, video game consoles, DVD players and cell phones. In the last decade, as demand for these electronic products has risen, the cost has fluctuated and new sources of these ores have been sought around the world.

Although deposits of these minerals are known on nearly every continent, it is the deposits in Africa, particularly those located in the Democratic Republic of the Congo (DRC), which have instigated the most controversy and currently necessitate the most scrutiny. Like many of the other natural resources extracted from the DRC, coltan ores are associated with violent conflict, exploitation of artisanal miners, illegal trading and the diversion of state funds. In addition to the harm caused to humans, much of this mining results in deforestation, which often takes place in and around the habitat of the endangered mountain gorillas.

The supply chain for coltan ores, like other conflict minerals, is complex, with the minerals changing hands numerous times. Coltan minerals typically lose their track-ability through refining and manufacturing.

Analysis

Supply Chain Complexity *(Complex)*

The supply chain is very complex with regard to material flow between the various links in the supply chain, and the change in composition from its raw form during manufacturing.

Formalization of Sector *(Informal)*

The supply chain for the ASM industry is typically informal. Certified-trading-chains are formal in their establishment of transparent, traceable, and ethical sourcing from the source through to the final product.

Material Processing, Coherence *(Mixed)*

As materials mix in processing, there is often an inability to track sources or provenance of metals. Separate handling and sealing of production from certified sites until export are therefore

crucial. Also, the process can only certify legal production. Formalization of the ASM sector is needed, but can also be supported by CTC.

Significance in Product Composition ***(Typically low %)***

Metals in an electronics product are typically parts of or ingredients in subcomponents or used to connect components. Each metal typically represents a small fraction of a particular product.

Issue/Source Geography ***(Relevant)***

This initiative directly addresses the DRC and minerals used in electronics products.

Stage of Development, Maturity ***(Early Testing)***

The pilot scheme for coltan 'fingerprinting' is complete, with further work being done on improving feasibility in terms of time and resource requirements. The pilot in Rwanda, to test out the initial guidelines and feasibility of implementation, is in progress. Broader stakeholder engagement is still in progress.

Nature of Governance ***(Multiple companies, multiple stakeholders)***

Although currently still being structured, the goals for this project are to create stakeholder groups representing governments, industrial, manufacturing, and commercial interests, NGOs, and other interested parties. There will be a steering committee consisting of representatives from the member countries that presides over the regional mechanism (which will be based on the Kimberley Process) and that systematically monitors the extraction and trade in the raw material exports.

Standards Breadth or Focus ***(Multi-Issue: Environmental and Social Objectives)***

This project has goals and objectives on both the social and environmental levels. It aspires to create transparency, both through a regular reporting/monitoring/auditing process, but also ensured through the 'fingerprinting' processes which have been developed. It hopes to utilize the mineral resources in these developing countries to mitigate existing poverty and strengthen regional stability.

Nature of Standards/Program Development ***(Multiple Companies with Stakeholder Input)***

This project seeks to work with the entire supply chain and all pertinent stakeholders.

Approach to Verification ***(Independent, Third Party Auditing)***

The pilot in Rwanda includes independent third party auditing to ensure compliance with those guidelines. It is linked to the national governmental bodies to issue the certificate and supervise the process. The verification systems for this project will likely utilize a similar system to that used in the Kimberley Process.

Key Findings

This project is still being piloted, but has direct implications for what EICC-GeSI is seeking to do.

BGR's determination that coltan minerals can be 'fingerprinted' indicates a possible means of backup verification for monitoring and auditing processes.

The CTC mechanism seeks to improve transparency and mining conditions in the ASM sector and support regional stability as well as to minimize the environmental impacts of these mining processes. This process may, apart from the regional implication, be applicable with other minerals around the world.

Pilot programs will help refine the initial guidelines and enable the creation of stronger yet flexible standards that can be applied globally.

BGR is also still attempting to generate a broader stakeholder group, as well as locate the champions to push the global acceptance of standards and mechanisms.

Regarding the fingerprinting to achieve broader application and implementation in the future, it will be important to identify ways to reduce the resource requirements for these fingerprinting processes, as well as to create a global database.