

COLTAN, MINING AND BIODIVERSITY CONSERVATION IN EASTERN DEMOCRATIC REPUBLIC OF CONGO

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Background

Coltan, an acronym for columbite-tantalite, is a metallic ore composed of niobium and tantalum. Coltan is refined into metallic tantalum, which with its unique capacitor properties is then used in computers, cell phones, and other micro-electrical circuits. It is found in eastern DRC, Australia, and only a few other areas in the world.

Tantalum demand increased exponentially between 1992 and 2001, mainly due to increases in production of electronic equipment such as mobile phones and computers. Throughout the late 1990's and early 2000's, the majority of world coltan originated in eastern DRC. During that time, prices were averaging about \$100 per kg, and were reported to sometimes reach \$600 per kg during periods of high demand and ore shortage. By February of 2004, prices fell below \$50 per kg.

The exploitation of coltan created a well-publicized late 20th century conservation crisis throughout eastern DRC, including the range of globally important and endangered species, such as Graueri's gorilla, the eastern chimpanzee, and the forest elephant. A boom and bust cycle of pricing lured thousands of people away from agriculture (reducing food security) into mining camps where anarchy was common (banditry, prostitution, disease, deaths from pit collapse, etc.) and has been identified as an important factor in fueling the civil war in Congo. This "coltan rush" therefore created conditions in which thousands of farmers abandoned their fields and become miners, selling their ore most often to Ugandan and Rwandan commercial interests, who moved the ore out of Congo and delivered it via flights from the Kigali and Entebbe to large multinational companies based in North America, Europe and Russia.

Coltan is mined in two ways. Most often it is extracted by groups of men digging basins in streams by scrapping off surface mud. They then "slosh" the water around the crater, which causes the coltan ore to settle to the bottom of the crater where it is collected. A team can "mine" one kilo of coltan per day. A second way in which coltan is mined is through pit-mining, in which a team of men will dig water-well-sized pits at depths of many meters, removing the earth, and sluicing it for its ore. At the height of the coltan boom (2000-2001) a coltan miner in Congo could earn as much as \$200 per month, compared to average earnings for rural workers that rarely exceed \$10 a month.

Coltan mining creates direct environmental damage related to the destruction of streambeds, pole cutting, and firewood collecting. However, more significant environmental damage results from the large camps of men (and armed guards) who poach local wildlife to maintain their mining camps. In 2001, it was estimated that over 10,000 people moved into Kahuzi-Biega National Park and 4000 into Okapi Wildlife Reserve in order to follow this coltan rush, effectively eradicating much native fauna near their mining camps (IUCN Web-based report, 2001).

Because of reports in 2000 that two World Heritage Sites in eastern Congo, the Okapi Wildlife Reserve of the Ituri forest and Kahuzi-Biega National Park, were being despoiled, the IUCN produced a special report in 2001 to the United Nations security council that called for a moratorium on purchase and import of resources from the Democratic Republic of Congo. Under the UNESCO World Heritage Convention, IUCN is the official advisor on Natural Heritage Sites to the World Heritage Committee. Each year, IUCN reports to the World Heritage Bureau and Committee on the State of Conservation of natural and mixed World Heritage sites. As a result of the ecological disaster occurring in 2000 -- 2001, the IUCN in 2001 produced a report to the World Heritage Bureau, and the UN then recommended three action items:

1. It called on buyers of coltan to ensure that the product they were purchasing did not come from Kahuzi-Biega National Park or the Okapi Wildlife Reserve in eastern DRC.
2. It supported the then current efforts to remove miners from the Okapi Wildlife Reserve, and it called on DRC, Rwandan, and Ugandan authorities to help enforce an immediate removal of miners from within the boundaries of both World Heritage sites.
3. It called on the buyers of coltan and the governmental authorities in DRC, Rwanda and Uganda to do everything in their power to find acceptable alternative livelihoods for miners removed from the two World Heritage sites.
4. It supported the UN Expert Panel's recommendation for a temporary embargo on the import and export of coltan as well as sanctions to be taken against Governments whose soldiers were involved in killing endangered species.

Although most of these recommendations were actually never put into action, the real effect was perhaps the sensitization of governments and large electronics companies involved in purchasing tantalum to the idea that there were political and environmental consequences associated with the production of electronic equipment. For example, in September 2001, the US House of Representatives passed a resolution to suspend coltan imports from the DRC. As a result, two US firms, Kemet and Cabot, stopped their coltan orders from the Great Lakes region, and American-based Kemet, the world's largest maker of tantalum capacitors, requested its suppliers to certify that their coltan ore did not come from DRC or neighboring countries.

The Tantalum-Niobium International Study Center (T.I.C.), the industry organization representing producers, processors and consumers of tantalum and niobium around the world, stated that it deplored the reported activities of illegal miners in the Kahuzi-Biega National Park and the Okapi Wildlife Reserve in DRC. A more realistic view of this, however, is that neither then nor at present, is it actually possible to physically determine coltan sources (despite some work with niobium/tantalum percentages as signatures for particular sources), thus analogous to the ivory trade, suppliers can mix many different sources together, masking "tainted" coltan.

Inevitably, market forces were probably the most important factor that heralded the "end" of the coltan rush, and its most devastating consequences for the environment in eastern DRC. With the crash of technology-related stocks, the reduced production of electronic materials, and finally, cheaper sources (and politically less problematic) of production-mined coltan from Australia, coltan prices eventually collapsed in late 2002 and 2003 dropping in price from as high as \$600/kg in 2001 to the 2004 price of <\$50/kg). This resulting in the majority of coltan miners turning to other mining activities or bushmeat and animal trafficking, and abandoning the "coltan rush". There

are only two major areas left in eastern Congo where coltan mining can still permit bush miners to eek out a living, precisely because the ore in these two areas are has a high enough percentage of tantalum to cost-justify its refinement into tantalum powder (these areas are discussed below).

The Current Coltan Situation

In meetings in March 2004 with conservationists supported by DFGFI, field workers, familiar with current bush conditions, conducted a qualitative threats-analysis for their regions. In these meetings, the perception of local stakeholders was that for most areas of Walikale (the territory between Maiko and Kahuzi-Biega National Parks) the “coltan rush” has passed, and that local miners are turning to gold, cassiterite, wolframite, and newer, sought-after ores, as well as diamonds to the north in Maiko National Park. There still remain veins of coltan in Punia, northwestern Kahuzi-Biega, and Itombwe that produce a high-enough quality of ore for miners to justify their efforts, and in those regions, the negative environmental consequences continue, albeit at lower intensities than was the case at the height of the rush. Despite these shifts, six of the 11 areas represented for these meetings identified gold and cassiterite mining (and the concomitant bush-meat use by mining camps) as the most significant threat to their local environment.

The ongoing difficulty with the coltan (and other ores) mining crisis, is that it has been occurring intensively for more than six years, and that many of the forested areas where these mines were located (or are still located) have already been de-faunalized, especially with respect to larger fauna such as elephants. In the emerging transitional government of DRC, there are still enormous gaps with respect to civil governance and finding methods to remove illegal miners (as for example, in Maiko National Park), since the majority are armed and being habituated with war, have no compunction in engaging in armed combat with authorities. Further, even in areas where traditional governance has some strength, miners are reported to be the biggest problem for emerging community conservation projects. These miners are often strangers from outside the area, do not respect nor respond to local traditional authorities, and can be armed and dangerous.

Looking for Solutions

Clearly, one international solution to this problem is to continue lobbying companies that are major coltan users to encourage them to find ways to prevent their sources using coltan from eastern Congo. Ideas such as “gorilla free” cell phones (like dolphin-free tuna) are appealing to many western markets (but not southern markets, which have the highest rates of growth for cell-phone purchases and usage). Continued pressure and publicity by the IUCN, UNESCO (supporting the World Heritage Sites), and other conservation groups may help to shrink up the market for eastern Congo. Developing ore signatures that can identify the sources of coltan would also provide a real measurement standard for the industry, enabling better accountability for source determination.

Despite all this, however, it is important to note that it is not simply coltan that is producing the conservation crisis in Congo; if anything, gold and cassiterite mining is

now having even more deleterious effects on biodiversity. So, while a concerted effort to remove DRC coltan from world markets will indeed have some positive environmental effects, it is by no means the solution to the environmental crisis brought on by mining in this region. Further, it is unlikely that an anti-DRC gold campaign could produce significant results (for example, much of the gold from Congo ends up in medium- and small-sized Indian shops where it is worked into small jewelry).

Real, long-lasting solutions must be found at local and national levels within DRC. Clearly, in protected areas like Maiko and Kahuzi-Biega National Parks, there must be strengthening of law enforcement and prevention of illegal extraction. Herein, though, lies another problem: many of the illegal miners in Maiko Park, have been in the Park making a living with gold for more than 10 years. To immediately remove them, without finding alternative livelihoods, would result in the forced migration of hundreds if not thousands of unhappy and well-armed miners. To attempt this kind of large social experiment at the moment in fragile DRC is well beyond that government's capacity. To even attempt an intervention like this, either in Maiko or Kahuzi-Biega, will require a concerted effort by large, international NGOs with expertise in alternative livelihoods, rural development, and conservation. The scope of an intervention such as this is well-beyond the funding levels of the grant awards provided to DFGFI for conservation interventions in Maiko for the next three years. However, DFGFI, in partnership with CI, will continue to make this problem known and seek out leveraged funding that might be targeted on this problem.

Clearly, however, to even understand the scope of the problem and determine possible interventions, more data are necessary. Because of the 8-year long civil war, almost nothing is known about the numbers of miners in Maiko, their locations, and the degree of income they are provided by these illegal activities. Thus, one of the first tasks for the DFGFI intervention is to train the Maiko Park staff to systematically collect these data and then to subsequently analyze and present them in a way that will enable plans to be created for the successful removal and transition to other lifestyles for these miners. Thus, the first step in addressing gold mining (and coltan to a minor extent) for Maiko National Park is to create a useful database on locations of mining camps, numbers of miners, illegal resource use extraction, and economic benefits that accrue to these illegal activities. From these data, plans can be developed that should realistically provide for the removal of these miners, the location(s) where they might be resettled, and possible alternative livelihood activities for these miners once removed.

With respect to relocating these illegal miners, the DFGFI interventions in community conservation surrounding Maiko National Park will also play a crucial role. Some miners come from these communities and with local Traditional Governance support might be induced to relocate. Clearly, however, surrounding communities will need to play a large role in planning for the relocation of these people, especially since the majority of these communities themselves are planning nature reserves with integral zones for which mining will not be permitted. Again, data collection focused on socioeconomic variables will be critical to begin the process of drafting plans; the DFGFI intervention thus includes provisions for local UGADEC project staff to collect these kinds of data.

Also, importantly, through the DFGFI intervention, community conservation staff are now in the process of determining the location of active and abandoned mines in their areas. Those near the Park not only face planning tasks for absorbing the relocation of

illegal miners, they also face mining threats in their own right. Throughout the entire area, each of the community projects face biodiversity threats brought about by mining. As they plan for their nature reserves, each project has already made the commitment that they wish to prohibit mining of any kind in their integral zones. However, they realize that in their buffer and development zones, they will need to permit mining, albeit environmentally-friendly mining. This will mean a substantial investment in overseeing these operations: they realize that no bush-meat hunting can be permitted, no large wood-cutting activities should be permitted, and they also face the task of how stream beds might be mined (as above) with methods that minimize environmental damage. Additionally, as traditional governance entities they must control the flow of new immigrant miners into their areas, while collectivizing profits for their groups. This will be a challenge in local governance; but clearly new methods and approaches will have to be conducted as experiments.

In summary, there is probably no pre-planned solution for the varied mining threats to biodiversity in this landscape. We see our approach at DFGFI as providing the tools for these people to collect data and to scientifically analyze the information such that it provides them management solutions. We can assist by lobbying at international levels, and by drawing attention to their needs and seeking out other leveraged funding that might assist them in finding solutions to these problems. Ultimately, however, they know their resources, their environment, and their local politics better than any of us. It remains for them to apply their ingenuity, their local governance skills, and their sense and philosophy of community to these problems and through experimentation find solutions that work for their contexts. Clearly, the first step in the process is the collection of good, comprehensive data, which can provide a baseline for developing realistic solutions of sustainable resource use balanced with biodiversity conservation.

Update December 2005

As coltan caught the attention of the world, and its mining diminished, in 2003-2004, a new mining threat for this region emerged: the mining of cassiterite (SnO_2). Cassiterite is the primary mineral ore for tin, and is found in hydrothermal and igneous veins, and importantly in DRC, in alluvial placer deposits (the latter identical to coltan). The new market for cassiterite has arisen from the electronics industry, in which a new demand for lead-free solder materials has led to the use of solder materials with a much higher proportion of tin.

Thus, the unfortunate reality is that the environmental threats associated with cassiterite mining are identical to those for coltan. The only factor in this equation is that the name and the ore have changed: what was a "coltan rush" has now become "a cassiterite rush". Further, the uses of these two materials are so identical that some organizations not terribly concerned with political correctness simply trade cassiterite as coltan, underscoring their almost identical uses.

Cassiterite is now bought from the field at about 2-3.5 US dollars per kilogram depending on its quality. And to provide some notion of the economics of this mining activity, we can use 2005 as an example. On average, each week more than 60 flights each carrying 2 tonnes of ore left the region of Walikale and passed through Goma, DRC: thus, just for 2005, at prices that might average 2.5 dollars a ton, the field-

based raw worth was easily more than 15 million US dollars, notwithstanding the value of processed cassiterite powder after it was prepared and shipped to international companies. And this was Goma alone; there are other important centers in eastern DRC such as Bukavu and Butembo, suggesting a cassiterite industry of easily more than 40 million US dollars a year. And this excludes trafficking in gold and diamonds.

At present, coltan has a similar field value, but with the stigma of coltan and the decreased demand, and a somewhat more difficult procedure for preparing the tantalum, it is easy to see how mining activity has shifted, and the conservation and economic crisis for this region has simply become a moving target. With these rapid shifts supported by a multimillion dollar (mostly) illegal industry, and with continued problems with security in the field, it is difficult for local conservationists to even keep up with data collection.

While the world focused on coltan, the "cassiterite rush" has continued unabated and so far has escaped attention and publicity. Now, once again, young men in the region have abandoned agriculture, and the lack of simple agricultural foodstuffs has created a condition in which the same planes that fly the cassiterite out of the area are bringing in simple food staples at very high prices. A vicious circle has begun, in which a miner must continue to work and while gaining higher wages, spends a good proportion of his wages for very high-priced food staples. Who benefits? Clearly, those involved in the trafficking, not those working the mines. And those of us interested in environmental protection and development of strategies for sustainable resource use that benefit local economies must again start a new sensitization campaign with the electronics industry. Meanwhile, in the field, some mines are now being developed that produce allied ores, such as wolframite. It remains to be seen how important these will become.

Clearly the scramble for Democratic Republic of Congo's resources has not abated. The ore has changed, but the forces, networks, and the destabilized economy remain the same.