

## **Greenwashing "red cobalt" : The environmental impact of mineral mining in DRC (Democratic Republic of the Congo)**

In the quest for greener tech and sustainable living, cobalt has become a key player and essentially powering modern technology and technological advances (Earl et al., 2022). This metal powers everything from smartphones to electric cars. The Democratic Republic of Congo (DRC), home to vast stretches of the Copperbelt, is where most of the world's cobalt comes from. It's a crucial spot on the map, meeting 70% of our global demand (Martínez-Alonso et al., 2023) and sitting on about half the planet's reserves (4 million tons in 2022), makes it an indispensable supplier globally.

The increase in cobalt production in the Copperbelt, mainly in the DRC, with a drastic change in land use between 2009 and 2021. The land cover changes were as the changes accounted by satellite images were as follows:

Rooftops increased by 147.2% (+7.7 km<sup>2</sup>), unaffected surfaces increased by 104.7%, bare land increased by 85.4% , exposed rock increased by 56.2% , trees decreased by 4.5%, shrub decreased by 38.4% (-26.04 km<sup>2</sup>), grass and cultivated land decreased by 27.1%, and water decreased by 34.6% (Brown et al., 2022)

This boom has positioned the country at the heart of the cobalt supply chain, crucial for making those lithium-ion batteries we rely on every day, not to mention its role in powering the push towards greener technology.

But, as we hail cobalt as the hero of our green future, the real picture of its extraction tells a more complicated story. The term "green cobalt" starts to sound a bit like wishful thinking when you look closer at the extraction processes in DRC. As written in the book "Red cobalt", Author Siddharth Kara points out the glaring truth: the cobalt supply chain is far from "clean".

Cobalt mining in Congo has both environmental and social serious consequences. For example, as we are gonna see it further, it causes and worsen deforestation and climate change, and this activity is also very dangerous both for workers and local populations. This backdrop of environmental and social challenges paints a complex picture of cobalt mining in the DRC, far removed from the "green" label often attached to it. As we delve deeper into the implications of cobalt extraction in DRC, it becomes clear that achieving truly sustainable development in this sector requires addressing these pressing issues head-on, with an eye toward justice and environmental integrity.

### **Cobalt mining : why ?**

Green growth is supposed to be a sustainable development strategy that aims to solve environmental problems at the same time as economic. The mining of cobalt in the Democratic Republic of the Congo is therefore backhanded due to the economic growth of the country, not necessarily weighing up to the consequences in the environmental sector.

It is easy to overlook the consequences of actions in the name of green growth. In this context the production of rechargeable batteries can come up. Rechargeable batteries are used to store the energy made from renewable energy sources such as wind and water. These rechargeable batteries can then be used in the usage of electronic equipment, such as electric cars. Of these the most prevalent type is the lithium-ion batteries.

Cobalt is a crucial part in the production of these lithium-ion batteries. It is used to create alloys that enhance the storage capacity of the batteries. It has now become a standard in the newer generations of lithium-ion batteries. And has been important in the advancements in the field of electric vehicles (Stanford Advanced Materials (2023)).

Rechargeable batteries is however also a double edged sword. Although they allow for sustainable development in the form of renewable energy storage systems, they also take a lot of resources to produce, while also being difficult to recycle after the storage capabilities have run out. Only 5% of the world's lithium-ion batteries are thought to be recycled (CAS Science Team, 2022).

In the past few years, one of the most prevalent elements in the global green growth strategy has been the electric vehicles. But, as it turns out the electric vehicles of the future does have its downsides too. Therefore, cobalt mining might not be a part of securing this green transition. Especially not for the DRC itself.

## **Why is cobalt mining unsustainable?**

### **What are its environmental and social consequences in Congo?**

Even if there is often a communication of cobalt as «green cobalt», it seems that the cobalt extraction, at least in our case study of Congo, is not sustainable development. This communication can then be considered greenwashing. In fact, according to Siddharth Kara (2022), the current supply chain of cobalt is not "clean" at all.

First, the cobalt mining in Congo has important environmental consequences : among them, it causes changes in land use, and more especially deforestation ; that threatens animals and plants habitats, which leads to biodiversity loss, but is also a factor that contributes to climate change (Davey, 2023) ; in fact, the Congo Basin's Forest has an important role of carbon sink that is crucial in the mitigation of climate change, and even more important today compared to the other rainforests. It also leads to the depletion of resources : of minerals of course, but it also threatens the water availability since the mining process is very water demanding. According to the AusLCI database, the most important environmental impacts of cobalt production are eutrophication and the contribution to global warming through the consumption of electricity during the mining process (Farjana et al., 2018). Cobalt mining is also polluting the air, soil, crops and water. For example, metal particles are emitted during blasting. Regarding the pollution of water, this is an issue for humans through the contamination of drinking water, but also for the fishes living in the lakes around the mines ; indirectly, human also lose income through the contamination of crops, but also from the contamination of the lakes : with less fishes, fisherpeople lose income. They are, in fact, interdependency between environmental and social factors.

What about social consequences of land mining? Cobalt mining in Congo is a particularly serious example. In fact, the working conditions are very hard and dangerous in the mines (Mucha, 2018); the «creuseurs»/digger people who extract and process cobalt are risking their lives -especially in the tunnels-, they are suffering working treatment abuses, a lot of them are underpaid since 40,4% of them are paid less than the legal minimum wage, the average of the 7 lowest income levels are 7.65 dollars (Bundesanstalt für Geowissenschaften und Rohstoffe. 2019), and children are working there too. In addition, there are huge income inequalities, workers are not the ones who profit the most from the mining activity, contrary to the mining companies and foreign corporations (Amnesty International, 2023), (Bolay et al., 2021). Working regulations are not respected, especially through artisanal mining, and human rights are violated. The cobalt mining in Congo has often been qualified as modern slavery (Torquebiau, 2023). But this mining industry is not only dangerous for the workers but also for the people living near the mines : for local communities are also suffering from severe health issues ; for example, dust and water pollution are causing birth defects, gynaecological and reproductive problems for women as irregular menstruations and skin diseases ; not to mention that cobalt has also cancerogenic characteristics (Nkulu et al., 2018). In the “artisanal” cobalt mines, people have higher levels of cobalt in their blood and urine, than in the areas that are more controlled - as it has been proved based on a study in the town of Kolwezi (Nkulu et al., 2018).

The extraction of cobalt in Congo has also led to land conflicts, land grabbing and displacements of local communities : in fact, the mining industry has already led to forced expulsions (Amnesty International, 2023). For example, in 2015, the company COMMUS wanted to increase its land mining ; with the help of the government, it has forced the inhabitants of the town of Kolwezi to move and destroyed the housings without a regular consultation, and with insufficient compensation. People lost their lands and livelihood. Sometimes, these forced expulsions are also supported by a military occupation and violence. This system has often been qualified as a situation of neocolonialism because it doesn't benefit the Congolese workers but rather the private foreign companies that work with the State. But one needs to mention that there are also lacks of information on what is happening exactly in the local communities of the country, especially on artisanal mining sites.

### **Do we have solutions? What are the perspectives of a different future?**

One solution for a more sustainable cobalt mining seems to be some «technological» solutions, for example favouring battery that are less cobalt demanding and promoting more recycling. There is also some research to produce batteries with lithium, nickel, manganese, silicon, and oxygen that could have a longer life. All of that could help to reduce the cobalt demand. (Nguyen, 2023)

Another solution seems to be a change of the working regulation, at the level of the State and the level of the companies, in other words ensuring decent working conditions and incomes for the workers in the

mines. Maybe companies could better control the conditions of their production and refuse to use the cobalt when it is produced without respecting these working regulations. Creating local democratic institutions and making sure local communities have the reality of power seems to be very important. But the cobalt demand could also be questioned : we could also more generally change our consumption patterns ; we could consider a more structural change in our economy, that could be more efficient and above all more sustainable for humans and the environment, based on degrowth theories (Gerber et al., 2020). In fact, we can think about an economy that would be less based on the industrial extractivism model. That has been defended for example by the anti-mining movements of Save Rosia Montana in Romania. They wanted to rethink the organization of production and create new local democratic institutions. In a degrowth perspective, cobalt would be less needed because the need for batteries and the affiliated technologies would be reduced too, and the economic emphasis put on other things, such as well-being and the provision of basic human needs for all. It would be less about the “green transition” with an equivalent level of production, but rather a bigger change of scale and priorities.

## CONCLUSION

We have looked at the different problems with mining in DRC that we have found that have negative consequences both for humans and nature. For example water quality, risks of accidents and health issues, pollution, biodiversity, fish and crops.

We have looked at possible solutions and in principle negative consequences can be sought remedies, as we have discussed some different solutions can for instance be other technologies, working regulations, consumption patterns changes, structural changes to our economy like degrowth and/or having less industrial extractivism.

One possible, but radical, solution given all the negative consequences for humans and nature is to halt the change towards electric cars, battery technology and other important technologies for a low CO2 emitting society. However, the climate change issue is also very important since climate change also has many different kinds of negative consequences, like for example water quality, health issues, biodiversity, fish and crops, but that is on a global scale (IPCC, 2022). The same goes, for example, for oil also, that is produced on land at least. And energy production for example in general has such dilemmas as with also for example to enable weather dependent local energy production one needs batteries (or other types energy storing facilities).

Green technologies in a lifecycle assessment are not green or fair enough at current times, so if someone who for example wants to sell electric cars and advertises them by saying something like ”Our electric cars are 100% green and 100% fair trade.” then that could very well be said to be greenwashing and fair washing, at the very least in most instances, if not all, in our current times at least.

Needed green technologies can have non-green related things which would not make them 100% green in a life cycle assessment. It would probably be smart to have cooperation between countries with regards to increasing international political pressure, to try to hinder a regulatory race to the bottom and to get more insight and transparency to be able to catch these things.

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