FIRE: THE FIRST-YEAR INNOVATION & RESEARCH EXPERIENCE

SUSTAINABILITY ANALYTICS

Do industrial mining companies protect artisanal cobalt mines against conflicts in the DRC?

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Research Question

Do industrial mining companies provide protection against conflicts for artisanal cobalt mines in the Democratic Republic of the Congo (DRC)?

Background

- Growing production for electric vehicles has resulted in skyrocketing demand for cobalt, which is a key mineral used in lithium-ion batteries.
- The DRC produces 70% of the world's cobalt, with between 18% and 30% of that cobalt being sourced artisanally.
- Berman et al. (2017) found that increased demand for raw materials led to more violence in Africa, especially in areas owned by foreign firms with no protection from the state. However, there is no conclusive evidence for the case of cobalt.
- As most cobalt is a by-product of copper mining, this project explores whether artisanal cobalt mines that are close in proximity to industrialized copper mines are less prone to conflict.

Data

- Locations of artisanal cobalt mines that were active between May 2019 and October 2020 from the International Peace Information Service (IPIS).
- Locations of industrialized copper mining permits from the DRC's Ministry of Mines.
- Locations and dates of conflicts from The Armed Conflict Location & Event Data Project.

Method

- We included only observations from May 2019 to October 2020, which is when cobalt mines were confirmed to be active.
- We intersected the locations of copper mines, cobalt mines, and conflicts.

Results

Locations of Industrial Copper Mines (in Red) and Artisanal Cobalt Mines (in Blue)

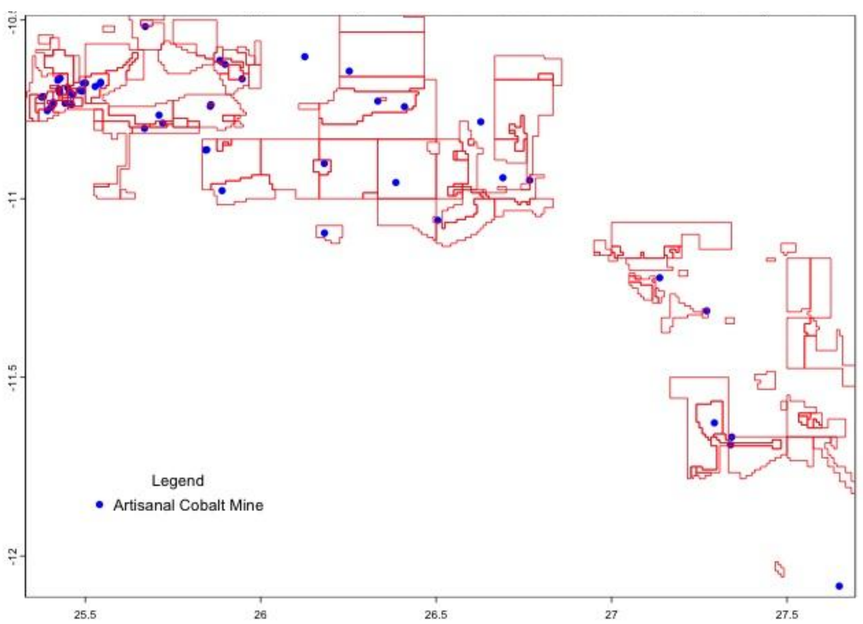

Figure Description:

This plot displays the boundaries of industrial copper mining permits (in red) and the locations of artisanal cobalt mines (as points in blue). All cobalt mines in the DRC are clustered within the Katanga province.

46 of the 52 cobalt mines are within the territory of an industrialized copper mine, while the other 6 are located near a cobalt mine

Characteristics of Artisanal Cobalt Mines

Copper Mine Company	Average #Conflicts	#Cobalt Mines
Not inside copper mine	0	6
BOSS MINING SPRL	0	5
CHEMAF MAKALA	0	3
COMPAGNIE MINIERE DE MUSONOIE GLOBAL	0	1
GECAMINES	1.08	24
GOMA MINING Sprl	0	2
KALUMINES Sprl	0	1
KAMOTO COPPER COMPANY	0	2
KANSUKI SPRL	0	2
SOCIETE MINIERE DE KOLWEZI	0	4
Swanmines	0	1
TENKE FUNGURUME MINING	1	1

Figure Description:

This table presents the mean number of conflicts within a 2.5 km radius of cobalt mines that are within the boundaries of industrial copper mines, categorized by industrial mining company

Cobalt mines that are placed inside the territories of Gecamines, a state-owned mining company, experience the most number of conflicts.

Conclusion

- Due to limited data, we do not have conclusive evidence that there exists a correlation between proximity to a large-scale copper mine and conflict around artisanal cobalt mines in the DRC.
- There does appear to be a weak correlation between a copper mine being operated by Gecamines and conflict in the surrounding area.
- A possible explanation for the relative lack of conflict in the region compared to the mines in the Eastern DRC is that 49 of the 52 cobalt mines are located in a region primarily inhabited by a single ethnic group.

Limitations

- The artisanal mining data is constrained by a small sample size (IPIS only visited 52 artisanal mines) and a narrow time frame (IPIS only visited the mines in 2019 and 2020).
- There are a number of confounding variables, such as population density, cobalt prices, and copper prices that were not taken into account in this research.

References

- Berman, N., Couttenier, M., Rohner, D., & Thoenig, M. (2017). This mine is mine! How minerals fuel conflicts in Africa. *American Economic Review*, *107*(6), 1564-1610.