Research Insight

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Fostering community-company engagement to address environmental impacts of mining

Recent initiatives by ETH and RMF illustrate the potential for mining-affected communities to actively engage with local mining companies on environmental issues. With limited external assistance in the form of capacity-building and modest financial support, community members can use constructive, evidence-based engagement methods to seek an improvement in companies' environmental management and disclosures.

Complaints about environmental pollution are among the most frequent causes of conflict between mining companies and local communities. Such impacts are often long-term: tailings and effluents from abandoned mines burden the local environment long after the mining operation has ceased.

At the policy level, two approaches – one focusing on mining companies, the other on civil society – have typically been advanced to improve environmental management and avoid the risk of conflict, where environmental regulations and standards are weakly enforced.

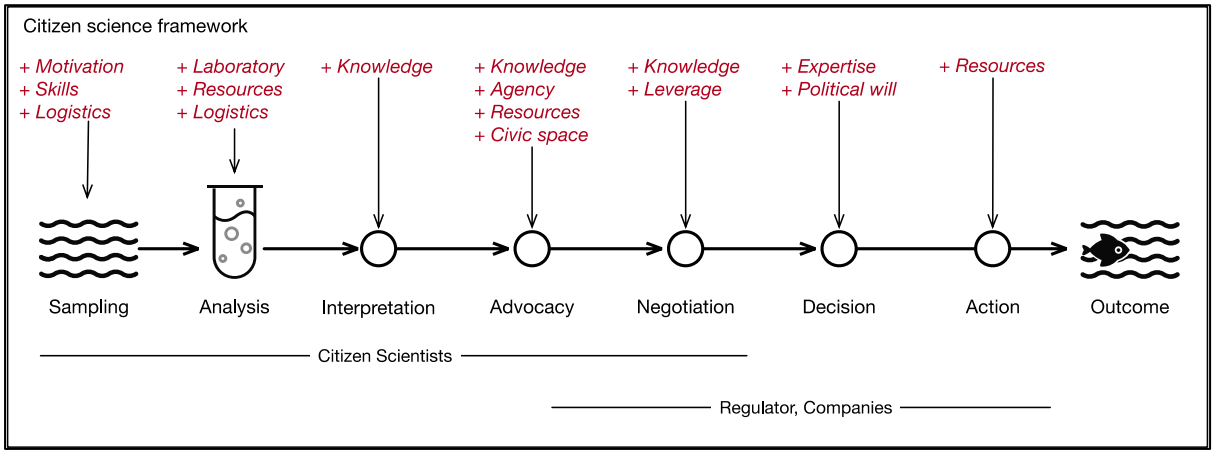
The first approach encourages mining companies to proactively and collaboratively engage with affected communities. For example, the World Bank Group's Office of the Compliance Advisor Ombudsman (CAO) has promoted joint environmental monitoring between mining companies and communities as a means to build a joint understanding and create mutual trust and goals[i]. Despite some encouraging examples, research from RMF suggests that most mining companies lack corporate systems to engage with affected communities on the management of their environmental impacts[ii]. It is also important to note that joint environmental monitoring, where it does take place, is of limited value if not followed up with collaborative approaches for decision-making and the development of corrective action plans.

The second approach promoted by the development NGO community focuses on social accountability mechanisms, whereby citizens hold to account their governments and the companies operating in their areas. However, social accountability initiatives are often met with resistance from the public or private actors involved. This particularly holds for

environmental issues, where the proof of pollution or other negative environmental impacts are typically contested and/or the responsibility of each stakeholder remains debated or difficult to attribute.

This Research Insight argues that for environmental monitoring to be effective, a more diverse set of strategies and actors are needed to overcome the limits identified for both joint monitoring and social accountability initiatives. Field research by ETH in a coal mining area in Zimbabwe and RMF experience with applications of its Mine Site Assessment Tool in Ghana in partnership with CeSIS reveal the potential for collaborative and constructive engagement between companies, communities and other stakeholders, based on locally-sourced facts and data[iii]. Such engagement can help communities engage from a more informed basis and can open up discussions on corrective action and remedy by the companies.

Figure 1. Citizen science can be a key driver of social accountability processes



Source: Ruppen and Brugger, forthcoming.[iv]

The citizen science initiative in Hwange, Western Zimbabwe

Coal has been mined in Hwange, Western Zimbabwe, for over 100 years. The company that started the coal extraction during colonial times has been restructured several times, but is still operating today, as the state-owned company Hwange Colliery Company Limited (HCCL) and remains the largest employer in the area. In the last two decades, small and medium sized companies, mainly Sino-Zimbabwean joint-ventures, have obtained coal mining concessions. Most of the coal produced is burned at the country's largest thermal power plant which is also located in Hwange. The rest of the coal is used for other industrial applications.

For decades, acid mine drainage and other effluents from coal mining, processing and combustion have been channelling into the Deka River, the main watercourse in the Hwange area. The river takes its source in the pristine environment of the world-famous Hwange National Park, before flowing through the industrial town of Hwange and finally into the Zambezi River. In recent years, the environmental condition of the Deka River downstream of the mining area has severely deteriorated. Rural communities regularly report dead fish and livestock in the area. Villagers fear for their livelihoods since they depend on fish as their main source of protein and use the reeds in the river to weave baskets as a source of income. Some community members even use the Deka River as a source of drinking water.

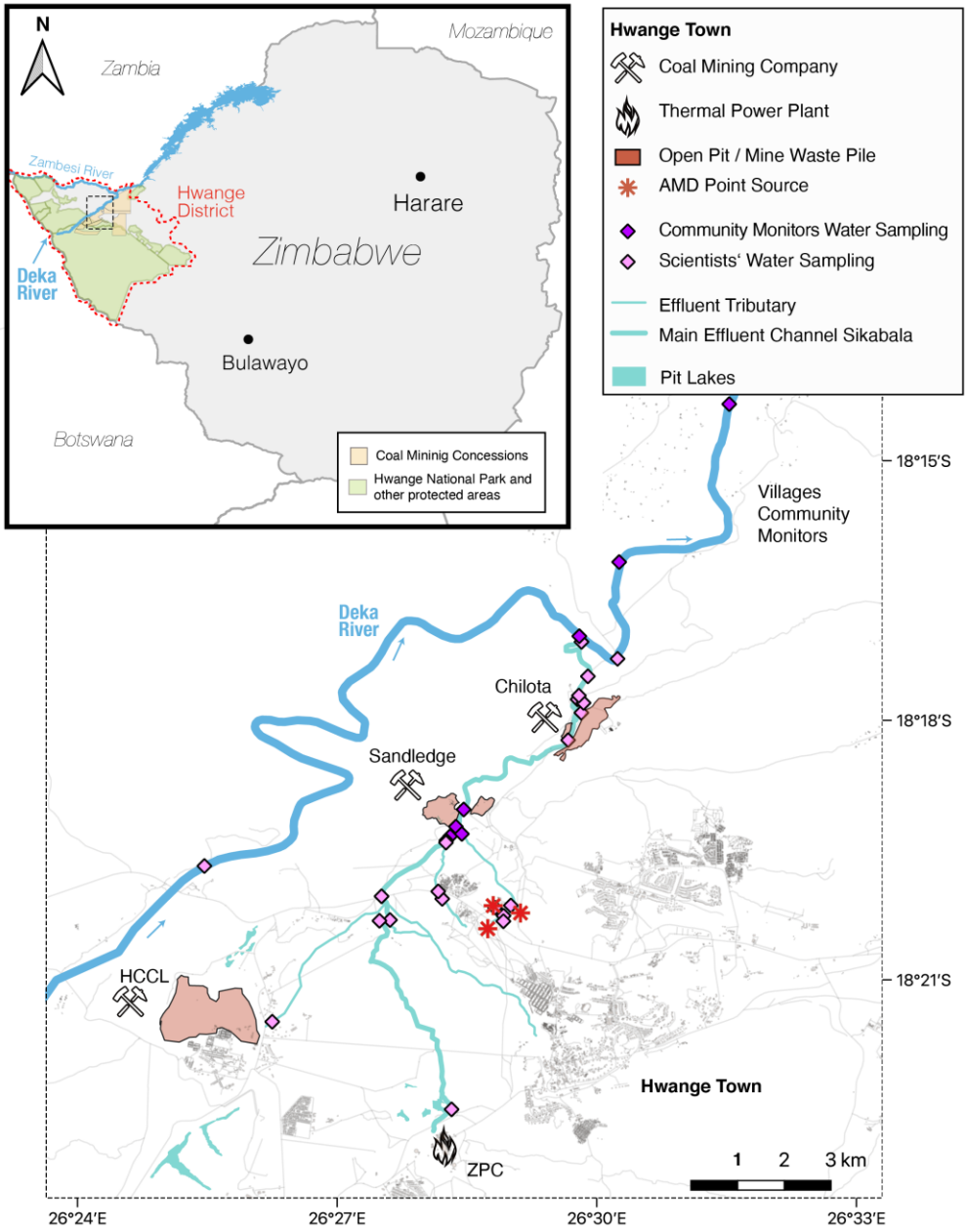
In 2017 villagers, with the support of a local NGO, managed to convene all relevant local stakeholders and present their claims regarding the environmental pollution. Those involved included representatives from the coal mining and processing companies, the local office of the Environmental Management Agency (EMA), the local administration, and civil society. However, this social accountability process soon ended in a stalemate; no mining company nor the power plant operator wanted to assume responsibility for the water pollution and ignored the local communities' request for drinking-water boreholes. Neither did EMA take measures to ensure that the environmental issues were addressed.

In this context, researchers from the Swiss University ETH Zurich[v] together with scientists from the University of Zimbabwe in Harare tested the feasibility and usefulness of citizen science. Would it be possible to identify the extent and the sources of the water pollution? Would the information co-produced with local citizens be taken serious by industrial and government players? And, most importantly: would impartial evidence be able to initiate change?

In December 2018, the scientists trained 13 volunteers from the local communities to collect water samples from the Deka River and its tributaries, and to measure water acidity. The volunteers were a mixed group made up of subsistence farmers, primary school teachers, and other employees of local businesses. Most of the volunteers have had very little formal education and some have been activists against environmental pollution. The training introduced the group to sampling procedures as well as a basic understanding of the parameters measured and how they impact water quality.

These newly-trained "community monitors" visited the different monitoring points every week or two to collect water samples. While the community monitors were not remunerated for their time, their expenses for communication and public transport to the sampling sites were covered. Contact among community monitors and with the scientists was maintained via messaging and phone calls.

Figure 2: Community water quality monitoring in Hwange, Western Zimbabwe



Source: Ruppen and Brugger, forthcoming[iv]

Over a period of 18 months, almost 800 water samples were collected. The results of the chemical analysis were frequently shared and discussed between the scientists and the community monitors. Once the data collected showed a clear picture of the different mining companies' contribution to the pollution, the multistakeholder platform from the previous social accountability exercise was re-activated to present the results.

What makes citizen science initiatives work

- Citizen scientists:[vi]
  - Motivation of the volunteers is key: Volunteers concerned by the environmental pollution with a direct interest in improving the situation are more likely to remain engaged in the process.
  - Knowledge and training: Training on environmental topics and sampling techniques needs to be adapted to pre-existing knowledge and educational levels of citizen scientists. Training and capacity building should continue over the entire sampling period to build the capacity of citizen scientists and empower them to interpret results and use them in negotiations with companies and environmental regulators.
  - Frequent exchange between researchers and citizen scientists: Updates and discussion of results are important to maintain the motivation of citizen scientists and identify early on any potential errors in sampling protocols.
  - Compensation for expenses: A small budget for communication and travel expenses is important for smooth sampling campaigns and to react in case of acute pollution events.
- Supporting environment:
  - Technical supervision and support: Trained scientists need to be available to accompany and consult the citizen scientists and co-decide with them on the sampling strategy. [vii]
  - Analysis: Laboratory capacity for analysis is crucial and is often limited in developing countries. Shipping samples abroad is to be avoided if possible since it involves complex and costly logistics.
- Communication and negotiation:
  - Citizen scientists need to understand results of the environmental analysis and use them in their advocacy activities.
  - Transparency: Results should be shared and discussed with all stakeholders involved in the pollution issue (government, industry, civil society…) to ensure that data is considered trustworthy.
- Timing:
  - Longer-term perspective: It takes a long breath to improve environmental condition in mining areas. Structures in citizen science projects need to be adapted to these boundary conditions and set up accordingly.[viii]

During the multistakeholder meeting in Hwange, the results from the citizen science project were received with great interest from all parties. As the regulatory authority EMA is insufficiently equipped to monitor environmental conditions and as mining companies are not able to monitor their effluents either, there is high demand from all sides for reliable data on environmental parameters.

For the community, the evidence empowered them to insist on their requests to at least obtain the requested water boreholes from the mining companies. This was partially successful and a number of new water points have since been installed.

Environmental managers in the mining companies used the data to raise awareness of the senior management and to advocate for better equipment. However, there has so far been no change in the environmental management practices of the companies.

The local EMA office used the data to require an action plan from the mining company that contributes most to the water pollution. Here, the fact that the data were collected by independent researchers and put in the public domain was important. This has opened up space for corrective action and improvement.

Unfortunately however, the availability of evidence was not sufficient to mobilize more rigorous action on the side of the government due to a lack of political backing.

The use of the Mine Site Assessment Tool in Ghana

In 2018, following requests from mining-affected stakeholders for a simple-to-use tool to assess local mining operations, RMF produced the first version of the Mine Site Assessment Tool (MSAT) as a free public good. The survey-type Tool is designed to be used as an entry point for constructive company-community dialogue with a view to seeking resolution of issues of direct importance to local people. The Tool covers 15 topics on a range of economic, environmental, social and governance (EESG) issues, including questions on environmental matters such as air quality, water quality and quantity, rehabilitation, and tailings management.

The MSAT has been applied in many different settings by mining-affected communities, labour unions, civil society organisations and other stakeholders. Following successful pilots in DRC, Ghana, Indonesia, Kyrgyz Republic, Mongolia, Rwanda and South Africa, RMF has supported local applications of the Tool in a number of countries. Now available in 14 languages, the Tool has proved effective in creating a non-confrontational space for community members and mine-site managers to discuss specific EESG issues of importance to the lives and livelihoods of affected communities. In some cases the Tool has been used in situations where there has previously been conflict or simply no communication between the mining company and affected communities, and has enabled the start of a constructive dialogue between these parties.

In Ghana, RMF has partnered with the Centre for Social Impact Studies (CeSIS), a local NGO specialized in evidence-based advocacy with a focus on the extractive industry. RMF and CeSIS collaborated on translation of the MSAT into the local language and in the design and implementation of a program of capacity-building for local communities wishing to engage with local mining operations to discuss their expectations and grievances on key EESG issues. To date CeSIS has facilitated use of the MSAT by five communities in connection with five different mining operations (see Figure 3). In some cases, these communities had been trying without success for more than ten years to engage with the mining operations, particularly on compensation relating to environmental pollution and the rehabilitation of abandoned pits left on people's farmlands where people had fallen in and died.

In some communities, initial applications of the MSAT were met with refusal by the mine-site managers to speak with the community members. To unlock the situation the community members approached the local regulatory authorities who intervened to require the mining operations to provide the information requested by communities. In other cases, the mine-site management while surprised to learn about their obligations for the management and disclosure of environmental issues, were more willing to engage with community members on issues such as air quality or water quality.

Figure 3. Areas of application of the Mine Site Assessment Tool in Ghana

In two regions, the implementation of the MSAT has enabled multi-stakeholder meetings involving District Assemblies, Security Councils, mining companies, communities and Members of Parliament. This helped ensure broad recognition of the issues, including the need for rehabilitation of pits, environmental monitoring and fair compensation.

In Manso Aponapono, the regional Minerals Commission Office has now visited the community several times and has engaged the mining company on fair ecompensation and other MSAT issues.

In Ayanfuri, a constructive dialogue has started with the company around local content and training of community members. According to several local leaders, the other issues on water, air and tailings are also being resolved by the company.

It is hoped that these initial conversations will result in improved environmental practices in the other regions too, but at the very least space has been created for continued engagement on these issues.

Involvement of external actors can strengthen effectiveness of local company-community engagement initiatives

The results from these two initiatives illustrate that while the availability of data is in itself insufficient to induce change, it does present opportunities for impact. This puts the strategic question centre stage: What alliances are most promising to transform local company-community engagements into effective environmental protection?

The best fit will naturally depend on the particular constellation of actors involved. In general, broader coalitions involving different stakeholders tend to be more able to create momentum for change.

In the case of Ghana, local regulatory authorities have been able to intervene where mining operations were initially unwilling to engage with communities. And the involvement of a respected NGO skilled in community capacity-building and awareness-raising has been instrumental in enabling local communities to engage directly and by themselves with mine-site management.

The initiative in Zimbabwe has also uncovered one group of actors which has rarely been considered a potential player in local environmental dynamics, namely the customers of mining companies. The international buyers occupy an interesting space: they are outside the local dynamics but economically important to local mining firms. The research revealed that local mining representatives consider requests from international customers as far more important than governmental requirements to convince the higher mine management to improve environmental standards.

HCCL for instance is currently undergoing ISO certification as this would facilitate relationships with international customers. Furthermore, an increasing number of multinationals, including those buying from HCCL, have procurement guidelines in place which require due diligence on environmental safeguards, working conditions and governance when sourcing raw materials. Yet, many of these companies use such guidelines rather as exclusion criteria than as opportunity to become a driver for change.

These commitments could be used far more strategically. For example, purchasing contracts between customers and suppliers could make reference to procurement policies and be used to push for a gradual improvement of responsible practices upstream in the supply chain.

Conclusions

In situations where reliable data and evidence are scarce, promoting citizen-led assessment and engagement can be a fruitful means of addressing locally-relevant environmental issues generated by mining companies.

The citizen science research in Zimbabwe shows that community monitoring is not only a powerful tool to create a large dataset on environmental quality and identify potential public health hazards. It also helped to empower communities and create new momentum for improvements. Likewise, the experience with the Mine Site Assessment Tool in Ghana has demonstrated that communities empowered with the knowledge of their environmental rights and equipped with a simple survey tool can engage on a stronger footing with mining companies on the need for improved practices and provision of remedy.

With the involvement of strategic allies and minimal external support, these local collaborative initiatives can offer an effective and longer-term alternative to more conventional approaches to driving accountability and continuous improvement on environmental issues.

[i] CAO, 2008. Participatory Water Monitoring. A Guide for Preventing and Managing Conflict. International Finance Corporation IFC & Multilateral Investment Guarantee Agency, Washington D.C. IFC, ICMM, 2017. Shared Water, Shared Responsibility, Shared Approach: Water in the Mining Sector. London.
[ii] RMF, 2020. Responsible Mining Index (RMI) Report 2020. [link]
[iii] See: (1) Ruppen, D., Chituri, O., Maideyi, M., Kudzai, M., Numa, P., Bernhard, W., n.d. Community monitoring to detect sources and extent of mining-related water pollution in Zimbabwe. Front. Environ. Sci. under peer review; and (2) RMF, 2020. Mine Site Assessment Tool [link]
[iv] Ruppen, D., Brugger, F., forthcoming. "I will sample until things get better – or until I die." Potential and limits of citizen science to promote social accountability. Evidence from a coal mining area in Zimbabwe. World Development. under peer review
[v] This work was supported by an ETH Zurich ISTP Research Incubator Grant
[vi] Vohland, K., Land-Zandstra, A., Ceccaroni, L., Lemmens, R., Perelló, J., Ponti, M., Samson, R., Wagenknecht, K. (Eds.), 2021. *The Science of Citizen Science.* Springer International Publishing, Cham. https://doi.org/10.1007/978-3-030-58278-4
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Responsible Mining Foundation

The Responsible Mining Foundation (RMF) is an independent research organisation that encourages continuous improvement in responsible extractives across the industry by developing tools and frameworks, sharing public-interest data and enabling informed and constructive engagement between extractive companies and other stakeholders.

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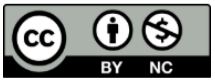

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