

Environmental Monitoring Toolkit
A Guide for Communities and Civil Society
Organizations





EARTHRIGHTS INTERNATIONAL

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Civil Society Organizations

This toolkit is a working document that will be updated periodically based on changes in the situation in Myanmar. It is only intended for use in Myanmar, which has significant challenges for the people who monitor resource extraction, particularly for mining industries. Security concerns are highly considered in the context of the situation in Myanmar.

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1. Abbreviations

CSO	Civil Society Organization
ERO	Ethnic Resistance Organization (also known as Ethnic Armed Organization)
NGO	Non-Governmental Organization
SAC	State Administration Council
WHRDs	Women Human Rights Defenders
MONREC	Ministry of Natural Resources and Environmental Conservation
INGOs	International Non-Governmental Organizations
VPN	Virtual Private Network
DICA	Directorate of Investment and Company Administration
KNU	Karen National Union

2. Background

This toolkit provides a set of easy-to-follow tools or methods to document locally occurring environmental and land-based issues in Myanmar. It provides guidance and resources for environmental defenders on how to monitor land and resource extraction that is adversely impacting communities, including environmental, social, and gender-based impacts. The toolkit has been developed with consideration of Myanmar's shrinking civic space. It aims to provide practical community monitoring and documentation options that can be used in the current social and political context.

Environmental defenders in this guide refer to community groups, civil society organizations (CSOs), environmental networks, woman human rights defenders (WHRDs), individual activists, and others working to protect the land, forests, ecosystems, and the communities that depend upon them.

This toolkit is not exhaustive — the tools or methods it contains are ones that environmental defenders can use to supplement land and resource monitoring practices already in place, in line with the resources available to them.

This toolkit aims to:

- Support existing land and resource monitoring activities conducted by environmental defenders.
- Identify methods for environmental defenders to monitor and track environmental, social, and gender-related impacts.
- Provide a base of resources for environmental defenders to use when conducting environmental monitoring, including checklists.
- Give guidance on how to assess risk and carry out monitoring more safely.
- Support environmental defenders in systematically compiling an evidence base for advocacy and future transitional justice processes.
- Provide thorough checklists for environmental defenders to use when planning environmental monitoring.

3. Introduction and context

On Feb. 1, 2021, the Myanmar military overturned Myanmar's 2020 election result and attempted to seize control of the country, which is now effectively in a state of civil war. As a result, the dynamics of land and resource extraction and the space for communities and civil society to respond have changed significantly. From 2010 to 2020, the country saw a period of democratic transition, with communities experiencing an increase in land confiscation primarily driven by the rise in foreign and domestic land-based investments, a liberalization of the economy, and a changing political and legislative environment. There was, however, a growing civic space for environmental defenders to monitor and resist incursions, including through advocacy to government stakeholders. For example, community mining monitoring groups, supported by CSOs, successfully advocated for the suspension of some mining operations.

Since 2021, this civic space has almost disappeared, and a dramatic increase in logging and mining by companies affiliated with the military's State Administration Council (SAC) and other armed actors has been widely reported. Environmental defenders face increasing difficulties traveling to sites of environmental harm, and communities are increasingly worried about the risks of engaging in environmental activities.

This toolkit provides:

- Methods and tools that environmental defenders can use to continue monitoring and documenting environmental and social impacts and harms in their areas. These include both ground monitoring (if it is safe enough to do so) and remote sensing.
- Methods and tools for identifying stakeholders in a project and potentially identifying areas of leverage that can be used to reduce future impacts and seek redress for injustice.
- A safety protocol to help assess and reduce the risks of this work.

Using these different methods together, environmental defenders can gain more information on projects, monitor their impacts, and consider advocacy strategies.

4. Monitoring methods

Community monitoring: Community members directly observe and experience environmental, social, gender, and cultural impacts and changes. This includes both historical impacts and ongoing day-to-day changes. Community monitoring is based on local experience rather than conducting investigations — it should be discreet and low-key. Communities may already be making written or photographic records of these experiences, or they may just be held as collective knowledge.

Documenting community monitoring: CSOs support community members safely and systematically record community monitoring findings. This collates community knowledge and puts it in a form that is easier to use for advocacy. It includes past impacts and monitoring of ongoing effects

Mapping: Where safe and viable, mapping can be a valuable tool for environmental defenders to document their land claims and resources, threats or incursions in their territories, or historic changes to land access and use. It can be helpful both for establishing and securing land claims and the use of natural resources and for understanding and documenting social and environmental changes.

Remote sensing: Remote sensing (i.e., collecting satellite images) can be conducted from a secure location with moderate internet

access. CSOs can do it to support and complement community monitoring, including in areas that communities cannot access safely. It can record changes over time and help identify current land use changes.

Desktop stakeholder research: Basic research looking for information on who is involved in a project, including searching for upstream and downstream value chains and other information. This will help environmental defenders assess both the risks of monitoring activities and identify possible advocacy targets.

Follow the money analysis: This is a series of techniques, that go beyond basic desktop research and help communities analyze investments that are impacting them and identify and target relevant stakeholders.



Why does the community want to carry out monitoring?

Understanding why a community wants to undertake monitoring and documentation — beyond the fact that environmental, social, and gender-related harms are occurring — is a crucial first step. Prior to 2021, for example, communities could document social and environmental harms to support advocacy to the Forest Department or Ministry of Natural Resources and Environmental Conservation (MONREC). The absence of governance or rule of law in large parts of Myanmar now means there may be no authorities willing or able to enforce environmental laws and standards. Monitoring and documentation require resources, primarily the time of community members and CSOs, but also sometimes financial ones. It also comes with varying degrees of risk.

In the current context, environmental and social monitoring and documentation can support advocacy or local governance efforts with locally legitimate authorities such as Ethnic Resistance Organizations (EROs) who may address harmful impacts. Monitoring can also support advocacy with international investors or contractors along global value chains. The information generated may also be used in broader processes of advocacy and transitional justice, showing the impacts that the growing conflict and political instability have on Myanmar's environment.

Whatever the reasons, communities and CSOs should work together to assess the time they wish to commit, the resources they have or need, and the risks they are taking, and balance this against the potential for accountability or impact either now or in the future.



5. Resource extraction in Myanmar

Myanmar has substantial resource wealth, from valuable hardwoods to large gold and tin deposits, oil and gas reserves, and rare earth and precious minerals. The extraction and governance of these resources have long been contested and have driven many different forms of conflict, including the damage and destruction of valuable ecosystems and communities.

Prior to 2021, there were mechanisms and the civic space to monitor resource extraction. There were stakeholders, including government, that could be targeted with advocacy that demanded accountability and enforcement. There were even signs that the court system could be used to hold some companies to account. Following the conflict across the country, resource extraction has become more challenging to manage and has become increasingly militarized. There have been many reports of increased environmental harm as a result of unregulated resource extraction. Environmental defenders who speak out have been targeted, and there is limited space for communities to organize. There is little distinction between legal and illegal mining, with all mining operating in a legal vacuum and extracting resources with minimal regulation. The increase in unregulated resource extraction poses serious challenges and increases the need for solid community monitoring systems.

Set out below are extractive problems that have intensified since 2021. These illustrate that the environmental and social issues from mining and other forms of resource extraction can be damaging in multiple ways. These may include pollution and use of toxic substances, soil erosion and siltation of rivers, deforestation, destruction of water sources, social issues (including increased sexual violence, harassment, and price inflation), health issues (including reproductive health impacts, respiratory problems, and skin ailments), and livelihood impacts. Community monitoring practices should try to capture all community impacts.

5.1. Gold mining

Gold mining can be found across Myanmar, with significant deposits in Sagaing, Mandalay, and Tanintharyi Regions, and Kachin, Shan, Karen, and Mon States. It includes both large-scale gold mines and many small and artisanal-scale operations run by small companies or groups, often with the backing of more influential elites. In recent years, there has been a dramatic increase in gold mining, particularly in Kachin State, where the waters and banks of rivers and streams have been seriously harmed.

Gold mining can have numerous negative social and environmental impacts. Alluvial mining practiced on the banks of rivers and streams causes serious problems, such as erosion of

riverbanks, siltation that leads to the drying of river basins, and loss of forests and biodiversity around streams and rivers. Severe impacts are also caused by the release of mercury into the ecosystem. Mercury, used in the purification of gold, is a potent neurotoxin that can have serious neurological and bodily impacts on those who are exposed, particularly young children and pregnant women. In large quantities, mercury can also cause death.

5.2 Tin mining

Myanmar contains some of the world's largest tin deposits, which are concentrated along Myanmar's eastern mountains, including Wa Region, Eastern Shan State, Kayah State, and Tanintharyi Region. Much of the tin derived from Myanmar's tin mines is exported to China. Thailand and Malaysia also import large quantities. Many of Myanmar's large-scale tin mines were established under British colonial rule but have been expanded in recent decades, often through investment from Thailand and China. Tin mining causes many issues; large-scale tin mining can cause soil erosion, sedimentation of rivers, and deforestation. Uncontrolled surface runoff from rainwater and dumping of mine tailings into rivers also cause many problems, often resulting in the leaching of lead and other heavy metals, which can cause neurological damage in those who depend on these water sources.

5.3 Rare earth mining

Myanmar has become among the world's biggest rare earth exporters. Rare earths are used in the production of electronic items, from mobile phones to solar panels. Rare earths in Myanmar are almost exclusively mined in northeastern Kachin State, and their extraction is carried out under an assortment of military-aligned militias, investors from China, and EROs. Communities in the area have suffered from a range of serious environmental harms, including the pollution of water sources, landslides, and the poisoning of agricultural lands. An investigation by Global Witness into environmental and social harms caused by rare earth mining can be found [here](#).

5.4 Logging

Logging has been a critical revenue source for successive colonial and military-led governments, EROs, and other armed actors. Myanmar's forests have teak, ironwood, and rosewood, which are of high value on international markets. Logging takes place in reserved forests and public-protected forests when forests are cleared for use by agribusiness. It also happens illegally often in community-managed forests. Sagaing Region, Kachin State, and Tanintharyi Region have experienced the highest levels of logging. Adverse impacts of logging include ecosystem and food web degradation, as well as increased soil erosion and landslides.

Forest degradation has serious and lasting impacts on biodiversity, local livelihoods, and cultural practices.

Future legal actions

If a community's monitoring goals include future lawsuits, CSOs should seek advice from lawyers in their networks. It is important to be realistic about whether a lawsuit will be possible, even in the future. There are two main challenges to consider:

- There is usually a limitation or period between when harm (such as a major spill from a mining pond that damages paddy fields) occurs and how quickly a community member must start a lawsuit in court. This can be as little as one year. Communities may be able to avoid this if they show it is an ongoing harm that does not stop (such as regular leaking from a mining pond or gradual sedimentation of a river).
- Courts in Myanmar may only accept certain types of evidence or evidence collected in a particular way.

6. Security considerations and risk mitigation

Conducting environmental monitoring activities during this period of political instability can be very high risk. Natural resource extraction has become increasingly militarized, the rule of law has receded, and armed conflict has intensified — each of these puts environmental defenders at significant risk. To mitigate against these risks and establish a foundation for secure natural resource monitoring, this section sets out key security considerations and risk mitigation strategies. In addition, the monitoring activities described in this toolkit are discreet and do not require environmental defenders to expose themselves to high levels of risk.



Environmental defenders understand the dangers and risks in their area better than anyone. Therefore, they should take a leading role in deciding how environmental monitoring should take place. The risks, however, are not the same for men and women, and therefore, women should be centrally involved in assessing risks, devising mitigation plans, and leading environmental monitoring. Where the situation is too risky to conduct ground monitoring, environmental defenders can rely on satellite imagery or desk-based research.

Environmental defenders can use many resources to strengthen digital security. These include online resources and information, as well as organizations that offer training on digital security. This table details some resources.

Resources for digital security	
Digital First Aid Myanmar	Burmese language online resource that provides a good toolkit on digital security, with easy-to-use instructions for improving digital security.
MIDO (Myanmar ICT for Development Organization)	Myanmar organization that offers trainings in digital security for CSOs and social movements.
Security in a box	Burmese language online resource for improving digital security.
Phan Dee Yar	Local organization that provides digital security awareness based on the needs and requests of partners.

6.1 Security considerations for communities: Risks/ mitigation measures

Community monitoring, when community members collect information on impacts, is likely the most high-risk phase of

environmental monitoring because sites of resource extraction are often highly militarized, and security personnel are on high alert. To reduce risks, community members can record information based on local knowledge and everyday observations and experiences. Community members can go about their daily activities and notice any changes in the community and surrounding environment.

Risk	Mitigation measure
Community members may be detained while conducting monitoring trips in the forest or around resource extraction sites.	Community members should only conduct usual daily activities and should not go to unsafe areas or conduct investigations. Noticing daily changes in the community already provides enough information.
Photographs taken by community members or volunteers expose the locations of community members and create risks for those involved and broader communities from SAC and other authorities.	Community members do not need to enter mine sites or insecure locations to collect monitoring data — they can monitor impacts on and from the community. If sensitive photos are taken, community members should send them to a third party in a safe location and immediately delete them from their devices.

Risk	Mitigation measure
<p>Women face sexual harassment or assault when they participate in environmental monitoring activities.</p>	<p>Before each monitoring activity is conducted, those participating should develop a clear risk assessment and mitigation plan. Monitoring should be performed in groups of two or more people and within the community, avoiding areas where there are armed personnel.</p>
<p>House or body searches at checkpoints reveal documentation of environmental monitoring activities, and SAC or armed groups detain or reprimand community members.</p>	<p>Community members involved in monitoring should not write down information. Instead, they should notice changes, make a mental note, and share information through encrypted channels when it is safe to do so.</p>
<p>SAC or other authorities track communications, and communities are reprimanded for contact with CSOs and engagement in environmental activities.</p>	<p>Strict digital security protocols should be followed. These include only using secure and encrypted messenger platforms such as Signal, self-deleting messages, and establishing secure times and locations for contacting partners.</p>

6.2 Security considerations for CSOs: Communication with communities, collation and storage of data, and risks/mitigation measures

Documenting monitoring information may also expose environmental defenders to risk. Documentation requires that CSOs discuss issues with communities and that information is collated, stored, and used. Each stage involves some level of risk. As mentioned earlier, communities should avoid taking notes by themselves. Instead, they can collaborate with trusted CSO partners to collate and document information. CSOs should then take strict precautions in contacting communities, documenting, storing data, and using the data for advocacy and planning purposes.

CSOs working with communities should also take digital security and gender awareness training.

Activity	Risk	Mitigation measure
Data collection	Participation in environmental monitoring practices exposes community members to significant risks, resulting in arrests, abductions, and other punishments from authorities.	CSOs should support community monitoring needs and demands rather than actively encouraging communities to monitor. CSOs should ensure they understand a community's objectives and discuss the possible risks of monitoring. Full digital security training might not be relevant at the community level. Still, community members who take part should be trained in safe practices, including the usage of phone and platforms.
	Women face sexual harassment or assault when they participate in environmental monitoring activities.	Before each monitoring activity is conducted, those participating should come up with a clear risk assessment and mitigation plan. Monitoring should be performed in groups of more than two people. It should be undertaken in the community, avoiding areas where there are armed personnel.

Activity	Risk	Mitigation measure
	<p>Messages or calls are intercepted or tracked by authorities and expose communities and CSOs to risk.</p>	<p>All phone calls and messages should be made through secure and encrypted channels, such as Signal.</p>
	<p>Calls are overheard by informers or security personnel, exposing communities or CSOs to risks.</p>	<p>Phone calls should be made at agreed-upon times so that all parties can ensure that they are in safe and secure locations. If phone calls are made via phone lines and non-encrypted apps, avoid sensitive words and phrases.</p>
<p>Data Storage</p>	<p>Security forces search digital devices, and information from monitoring activities is exposed, resulting in detentions.</p>	<p>CSOs should set up secure online servers or clouds where community data can be stored so that community members and CSOs can wipe all data from their phones. Communities that take photographs, create documents, or send messages can transfer their data to CSOs who can use a secure cloud such as MEGA and immediately wipe all contents from their phones. CSOs can work with networks outside Myanmar to store data.</p>

Activity	Risk	Mitigation measure
	Security forces find data, exposing communities and individuals to risk and reprimand for their role in monitoring activities.	CSOs should anonymize all data, never using the real names of individuals or other features that may identify individuals or communities. If necessary, those documenting can use pseudonyms or create codes to remember locations and individuals. Personal data should also only be shared with trusted groups or individuals and not shared publicly.

6.3 Security considerations for advocacy: Risks/ mitigation measures

Monitoring information becomes most exposed when it is used for advocacy. Information might be used to resolve local issues with local customary institutions or legitimate authorities, or it might be used in broader advocacy campaigns that reach national and international audiences. The use of sensitive data clearly comes with risks that those involved in the collection will be exposed to. In order to mitigate these risks, information that can be used to identify people should be omitted. There should be no clear links that connect those involved in the collection and documentation of data to the publication of it.

Risk	Mitigation measure
<p>Advocacy campaigns reveal organizations involved in data collection and then expose communities to risk through affiliation.</p>	<p>Advocacy should either be conducted under the name of an anonymous network or through an organization located outside Myanmar, ensuring that information does not lead back to environmental defenders.</p>
<p>Advocacy materials that use monitoring information reveal specific communities or individuals involved in monitoring, leaving them exposed to reprisals from security forces.</p>	<p>Before publicly releasing the names of villages or other identifying features, CSOs should consult communities, ensuring that they have their full informed consent before moving ahead with advocacy. CSOs should be careful to ensure that the voices of women are included in consultation processes.</p>

7. Toolkit for environmental monitoring

This section sets out six main tools:

- Creating a project impact timeline
- Ongoing community-led monitoring
- Participatory mapping
- Remote sensing
- Desktop stakeholder research
- Follow the Money analysis

At the center of this is the concept of community-based monitoring, also known as participatory monitoring or citizen science. This draws on the expertise of people with a close connection to the environment around them. There is growing recognition of the expertise of communities and the fact that it can be more effective than traditional scientific monitoring in identifying environmental issues. This is particularly important somewhere, like in Myanmar, where communities have limited access to technical or scientific resources. These tools facilitate or support community-led monitoring.

Local monitoring is mainly conducted through everyday observations of local communities, with CSOs supporting community members to document or collate these observations securely and safely. This can help to identify new issues, monitor existing social and environmental problems, and create local or

collaborative solutions to these by engaging with locally legitimate authorities, such as customary institutions or EROs.

Many CSOs already have mechanisms for supporting community-level monitoring, whether this be staff/volunteer networks based in communities, phone lines for community members to call, or regular community visits. This toolkit seeks to strengthen these rather than replace them. The documentation of community monitoring can be split into two main parts:

- Project impact timeline to document the chronology of a project and its impacts so far.
- Supporting ongoing community-based environmental monitoring.

While the toolkit separates these, they are organic processes that overlap and inform each other. A chronology can help guide ongoing monitoring, which will raise information that can be added to a historical chronology.

When compiled together, ground-level data can provide a critical resource for informing local governance decisions among communities or parallel authorities for advocating with upstream value chains or international mechanisms working on biodiversity and climate change. Data may also be stored safely and preserved for future processes of transitional justice.

Case study: Local knowledge-based research in Tanintharyi

The report linked [here](#) details the local knowledge of indigenous Karen communities along the Tanintharyi River. The depth of local knowledge in this report is an example of communities being experts in areas that are often classified as “scientific.” It shows that local resource monitoring conducted by communities utilizing their local knowledge and observations of changes to their ecosystems can be compelling.

7.1 Project impact timeline: Documenting the chronology of a project

A project impact timeline records the history of a project or extractive activities and the environmental, social, and cultural impacts they have on a community. This can be useful because:

- The detailed knowledge of community members may be lost as memories fade or merge over time or people move away.
- It shows vital events that may have changed a community's resource use or access rights. When combined with monitoring information, this can also help to build a body of evidence, establishing the connection of environmental impacts.

- It creates an essential narrative of environmental, social, and gender-based impacts and changes that can be useful for advocacy and allowing other stakeholders to understand issues.
- Collating historical impacts can give guidance on what to monitor and observe in the future, especially as community members will often have limited time and resources. It can help to focus monitoring on specific parts of a community's land (e.g., particular creeks, wells, or areas vulnerable to logging), types of impacts (e.g., on biodiversity, health, water, and social and cultural practices), or key indicators (e.g., particular species that are vulnerable to logging, sediment in rivers, or the ability of a community to grow a specific crop).

A chronology or project impact timeline can be anything from a small table with a few lines setting out the main events to a long and detailed document. This can depend on the time that CSOs or community members have or want to spend to collate all the information, the scope and duration of the project or extractive activities, and the kind of advocacy that the community wants to undertake.

Questions for environmental defenders

How to use the project impact timeline?

The project impact timeline provides an essential context for addressing harmful operations. It shows how an operation has impacted a community, as well as providing a narrative for future advocacy.

How much time will it take?

Depending on the details, creating a project impact timeline should not take a long time. Together, CSOs and communities can establish a timeline for the project and subsequent impacts, taking a maximum of a few hours. Alternatively, it could be a much more detailed review that requires multiple discussions.

What are the security concerns, and how can risks be mitigated?

Historical and contextual information captured in a project impact timeline can hold information that can implicate communities or individuals. Ensure that names and places, where possible, are either omitted or pseudonymized.

How do we include women and marginalized groups?

The inclusion of perspectives of women and marginalized groups is essential, particularly as these groups often suffer

more significant impacts from harmful resource extraction. Considerations could include how resource extraction has impacted ownership, control, and decision-making between men and women. Communities should make sure to observe these, and CSOs should be careful when documenting them.




A project impact timeline can help inform ongoing future monitoring, but it is not essential. CSOs and community members can start to document ongoing community monitoring without one, and collating this information might not be a priority for a community. It is also a document that can be developed or organically added to over time. CSOs supporting communities can also update or start an environmental impacts diary, making it an ongoing task and adding to it each month in order to get a detailed history of a project and the impacts felt by the community.

The types of information that can be included are:

- Information about community life before the project, including significant events in the community's history.
- The main stakeholders in the project. This can be developed using the desktop stakeholder research tool.
- Any consultation or consent sought by the company or authorities for the project. Examples of questions are: "Are there any agreements with local elites in the community?" and "Are there conflicts in the community because of this?"
- Dates of critical events, changes, and impacts, including environmental impacts (on air quality, river, creeks, wells, soil, and farmland) and social impacts (livelihoods, land seizures, sexual violence, and implications on women and marginalized groups).
- Numbers that quantify impacts, such as acres of land confiscated, households that experienced specific health issues, etc.
- Dates and details of meetings or communications sent from the community or CSOs to stakeholders (such as local authorities and the project operators).
- Individual stories or examples of how people have been affected.

It is also essential to collect existing photographs and videos. Once they are stored securely online, community members can consider deleting them from their devices to reduce their security



risks. It may be unclear when or where photographs and videos were taken, so if possible, this should be recorded, too.

This table is an example of the questions that can be asked to help put together a chronology or project impact timeline. CSOs can use this to help document impacts. Questions can be changed in line with the project’s effects and details, including for situations when there is no single project but a general increase in logging and small-scale mining. A case study in Annex 1 provides an example of a project impact timeline. Annex 2 sets out a checklist with more detailed information and relevant impacts.

Question	Date (Year)	Notes/Description
When did you first find out about the project? Please explain how.		
Did the company conduct any consultation? If so, with whom?		
Did anyone in the community or the surrounding area agree to the project? Who?		

Question	Date (Year)	Notes/Description
What is the history of administration and conflict in the local area? Have there been any changes?		
Have there been any social conflicts in the community related to the project?		
What are the main negative impacts that you have experienced from the project? When did they first start happening?		
What is the timeline of the negative impacts on the community?		
When did you meet with company/authority representatives?		

Case study

This [report](#) contains an excellent example of a community chronology/timeline of harmful events from an oil palm project in the Tanintharyi Region that impacted a community.

Centering the voices of women and other marginalized groups in environmental monitoring

Women face systematic social, cultural, economic, and legal barriers that affect equitable natural resource governance. As a result, their voices are often lost. The result is that women and marginalized groups, such as the landless and minority groups, are usually disproportionately impacted by the environmental and social impacts of extractive operations. Women and marginalized people may be disproportionately of resource access, exclusion from decision-making processes, and lack of access to economic opportunities in mining. They may also lack access to information in the extractive sector.

Furthermore, the impacts of pollution from mine waste may be felt more by women, children, and marginalized groups, firstly because heavy metals can have more damaging effects on the bodies of children and developing fetuses, and secondly, because marginalized groups may not have access to alternative water sources. This can undermine women's

capacity to provide food and clean water for their families and subsequently lead to an increase in their workload because they have to work harder, longer, and further from home to access water, food, forest products, and fuel wood. When their previous livelihoods are no longer available or viable, women may resort to employment that is abusive or exploitative, such as commercial sex work.

Given the excessive impacts that harmful environmental impacts of resource extraction operations can have on women and marginalized groups, their participation and voices are central in any monitoring process.

7.2 Ongoing community-led environmental monitoring

Why conduct environmental monitoring?

In addition to documenting the details and chronology of impacts that communities have suffered from extractive operations, it is essential to monitor environmental and social impacts at regular intervals. This (1) gives a better understanding of how a project is impacting a community, (2) highlights issues to focus on ways to address them, and (3) establishes a clear base of evidence for potential advocacy.

This section explains community-based environmental monitoring, who conducts it, when, and how. It then sets out how CSOs can support this process and collate the data.

Community-based environmental monitoring, also known as citizen science or participatory monitoring, is a practice of data collection that uses local knowledge, experience, and observations in order to build evidence or a clearer understanding of local environmental changes. This local insight and knowledge can be compelling.

Community monitoring does not mean conducting investigations into environmental issues. It is more about collecting everyday observations and experiences that can tell a lot about changes to the surrounding environment and the impacts caused by extractive projects.

What should be monitored?

- Local monitoring is systematically recording community observations about changes to their land and environment as a result of a project.
- Most importantly, it does not mean conducting investigations; instead, observations can be made through day-to-day activities and recorded at regular intervals with the support of CSOs.

- A community should decide upon the indicators for monitoring, depending upon the operation and the kinds of social and environmental impacts that are experienced. If, for example, a community is monitoring the leaching of mine waste into a stream, they might monitor how many times waste is dumped into the stream, the color of the water, or the health impacts that community members have experienced.
- A project impact timeline can help determine what indicators to monitor.

Who should conduct the monitoring?

- Local communities, residents, WHRDs, or community-based organizations that are residing within or around affected communities and areas.
- It is essential to ensure that monitoring includes women and marginalized groups within the community.
- Monitoring can either be conducted on a voluntary and informal basis by people with specific concerns or in a more formalized way through community-based organizations.

How often should community members make observations?

- Environmental monitoring of this kind only needs to be conducted when communities are suffering negative impacts.
- Monitoring should be conducted regularly to establish any patterns and a clear evidence basis. It is likely to be at daily, weekly, or monthly intervals, depending on what is being monitored. For example, tracking the number of times community members experience rashes or sickness from a polluted water source could be done monthly. Tracking the number of logging trucks crossing an area may require daily monitoring.

Stages for environmental impact monitoring

- Choose indicators for environmental/social impact monitoring.
- Make a plan for how regularly community members make observations (daily/weekly/monthly).
- Agree on a process for community members to share findings with supporting CSOs.
- Collect and document observations and regularly evaluate the process.

How should communities start monitoring?

- **Choose monitoring indicators:** These should be (1) easily identifiable and observable, (2) related to everyday social and environmental impacts that community members have been observing already, and (3) easily collected during everyday activities. Annex 3 sets out most of the impacts that could be monitored. CSOs can help communities select the most relevant ones (a project impact timeline may inform this).
- **Create a checklist:** Make a list of the indicators that have been selected, but be sure to leave “open” questions to capture all community observations. Community members do not need to keep a copy of this checklist if it is not safe to do so; it can be kept by CSOs operating in less risky areas. Annex 1 sets out a case study with a project impact timeline and a checklist for ongoing monitoring.
- **Collect data:** There are many options for how to collect the data on the checklist and the method that CSOs and community members choose will depend on factors such as security risks, the presence of local authorities, and access to the internet. If it is unsafe to do so, community members do not need to write down or document what they find out. They can observe and share information with CSOs at regular intervals. This will mean that CSOs based in a more secure location will have to check in regularly with

communities in affected areas in order to record community observations.

- **The following are examples that CSOs can tailor to suit the needs of communities:**

- Community members can avoid keeping any written record by scheduling a regular check-in by phone with a CSO, ideally using a secure app such as Signal. The CSO can then take a record of the community members' observations, asking questions based on the checklist.
- Community members may consider it safe for them to keep a checklist, either on paper or on a device that can be filled in at regular intervals when at home. It could be filled in on an ongoing basis or only once a month, for example. Keeping such documentation is a risk. This can be reduced slightly by using code words in the checklist, completing monthly records, immediately sending them to a CSO with a deleting message, and then deleting the record.
- Community members can send observations to CSOs as and when they make them, using an app like Signal and disappearing message mode for the senders.
- CSOs may choose to store all data on encrypted and password-protected clouds, deleting all data from their devices on a regular basis. Communities can also send data to CSOs for secured online storage.

- Community members or CSOs might want to use an app like MAPEO.
- Locally based CSOs may also be in high-risk areas — they can seek the support of CSOs or International Non-Governmental Organizations (INGOs) based in areas outside military control or outside Myanmar in order to store sensitive data safely.
- **CSOs should then help communities to evaluate and analyze findings at regular intervals (e.g., on a monthly or bi-monthly basis).**

Community monitoring: Environmental and social impacts to look out for

See the checklist in Annex 3 for more issues to monitor/ indicators to use.

Water: What color is the water? Are community members able to drink it? How is the flow and level of the water? Are there any observable changes? Is it still okay to bathe in the water? How are the fish populations? Who has lost access to water?

Forest, biodiversity, and wildlife: How is the forest's condition? Has anyone seen any deforestation? Has anyone noticed any decline in animals? Have there been any fires? Have any community members lost access to the forest?

Land: Have you noticed any changes to soil quality? Are some plants growing less or differently? Have you seen any cracks or dryness? Have any community members lost access to land? How have land ownership and access changed? Have these had impacts on gender dynamics?

Air: Have community members identified any air pollution? Any bad smells? Have they experienced burning? How many times per week does the community experience terrible smells? Is there dust residue left behind? Have any community members experienced respiratory issues or breathing problems?

Health: Have community members been suffering from any unusual ailments (such as rashes, kidney pains, headaches, and respiratory problems)? How many people in the community have suffered from this? Do pregnant women and children have any different health issues? How is the maternal health of women in the community? Do community members have a view on why any ill health is arising?

CSO and community capacity building

Monitoring projects can sometimes be more effective when the community members carrying out the monitoring have more information about the project. Suppose they know

about some of the leading mining processes or the associated impacts, they can look for additional signs as they go about their usual activities. For example, if community members can identify harm as acid mine drainage and know where to look for it, they may notice and document it more effectively. A community member may be able to make more accurate or persuasive observations of an irresponsible mining operation if they know how a mining waste heap in a responsible mining operation should look. For example, it should not have steep sides and should be re-vegetated or covered in a geotextile cover. Rainwater should be channeled away from mining waste, with sediment-filled water (i.e., water that has run over or through the waste heap) being collected in sedimentation ponds. Of course, community members may already have a lot of technical knowledge, for example, if they are also engaged in artisanal mining or work at a mining site.

Another example is health impacts — as noted, heavy metals have specific health implications, including less obvious ones such as neurological impacts, particularly among children, loss of concentration, dizziness, or falling IQ levels, and congenital disabilities. Women may have higher rates of miscarriages or other complications. If community members are aware of these, they may document impacts that might otherwise be missed or at least discounted.

Community members undertaking monitoring or the CSOs supporting them may want to seek training to increase their technical knowledge of a particular project.

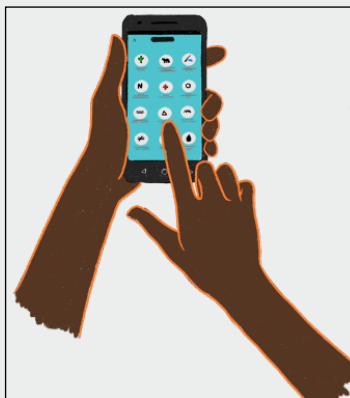
Considerations for environmental monitoring

- **Prioritize safety:** CSOs and community leaders should review the section on risk before undertaking monitoring. Community members should not collect data or retain it on mobile devices or written documents unless they have assessed the risks and feel comfortable taking them. Data can be collected again if it is lost — if in doubt, delete it.
- **Avoid high-risk areas:** Community monitoring should not be conducted in high-risk areas, for example, in areas that are impacted by conflict.
- **Include women and marginalized groups:** When supporting community monitoring, CSOs must take steps to ensure that voices from women and marginalized groups are included in the process, ensuring that they are collecting data and that the specific impacts they may face are recorded.
- **Agree on monitoring principles:** Monitoring should be part of everyday activities, and community members should not conduct ground investigations or substantially vary their routines. This means that community members

should not go to unusual places or place themselves in high-risk areas. It is important to remember that if one person takes risks that go beyond the principles, they are putting other people at greater risk, too.

Resources for environmental defenders: MAPEO

[MAPEO](#) is a mobile app that allows environmental defenders to document environmental and human rights information in their territories. The resource supports defenders in mapping natural resources of crucial importance and documenting changes in these areas.



The app works well in areas without an internet connection. It allows information to be shared between a group of people. The app was developed with indigenous peoples and has also been translated into the Burmese language.

This app is [recommended](#) for environmental defenders to use to record and store information.

Supplementing community monitoring with scientific monitoring

Community monitoring does not require investigations where community members go outside of their usual routines or involve access to technical expertise, equipment, or training. In some cases, however, it may be possible to supplement community monitoring with scientific monitoring, such as remote sensing. Other examples include taking water, soil, fish, agricultural produce, and air samples. Health testing, such as community members giving blood and hair samples, can also be very informative.

Water and soil sampling may be possible where community members can access land and waterways without additional risk (for example, streams running through villages or their farmland). CSOs would need to provide communities with training (which can be online) on how to collect and store samples. However, Myanmar has limited laboratories to analyze samples. Collecting and sending samples to laboratories in Yangon also creates security risks.

An alternative may be to send samples overland to CSO partners in neighboring countries, particularly Thailand and India. This kind of testing is not just useful for advocacy — it can help to identify health risks that a community faces, such as heavy metals in water sources. This can assist communities in mitigating harm and may also affect the

extent to which community members want to take risks in advocating for local authorities. However, suppose a community finds that people or livestock become unwell after using specific water sources or that water appears unfit; they have likely already addressed this to some degree through community monitoring.

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Air sampling is more problematic as it requires more equipment and data collection over a more extended period. At this time, this is unlikely to be possible for most communities in Myanmar.

Blood testing is impractical due to the need for specialist equipment, training, laboratories, and the need to keep samples refrigerated. Hair sampling (which can show heavy

metal poisoning) is more practical as samples do not need to be refrigerated. For any sampling that collects personal health data, CSOs must be careful to discuss with communities how to handle such data (including if results are anonymized or shared with CSOs and, if they are shared, how they should be communicated back to community members).

For all of these scientific forms of testing, CSOs can seek support from their wider networks to identify relevant tests, training, and equipment needed to take them, as well as the costs of doing so. Where testing is possible, they can assess the risk of doing so with communities while bearing in mind how much the scientific testing will add to the findings and support the goals of community monitoring. Testing may be more practical for projects nearer to Myanmar's borders or in ERO-controlled territories.

7.3 Participatory mapping

Participatory mapping can be an effective method to empower communities to identify and document resources and lands that belong to the community, recognize challenges and incursions onto the territory, and create local solutions to these problems. Maps can contain lots of different kinds of information, including physical features of the landscape, infrastructure and buildings, land and resource use areas, and political and administrative boundaries. Information may also include who has access to

resources and resource use rights, historic changes to land and resources, and intrusions and threats to land, such as mining operations.

Participatory mapping usually involves identifying and drawing territorial boundaries and identifying essential resources and land use areas collectively in a community. CSOs can help communities map their lands and resources by drawing territorial boundaries onto tracing paper and adding in areas, resources, and others of significance. If hand-drawn maps are traced from printed cadastral maps, they can then be georeferenced and digitized, allowing communities to look at areas of deforestation or overlaps with other land uses.

When land and resource use mapping, it is imperative to elevate the voices of women and marginalized groups in the process, as their land claims are often the most contested or threatened. When conducting mapping, CSOs should consider supporting separate processes with different groups or use the differences between various groups as a point of conversation and ensure that other perspectives are documented.

Why and when would communities use mapping?

Mapping can be an effective and essential tool for communities and environmental defenders for a number of critical reasons:

- Mapping can help communities document their land and resource ownership, access, and use. This may help communities to prove their land tenure claims and resist encroachment into their territories.
- Mapping can help to show and understand threats and land incursions within a community's territory, clearly showing how an extractive project might be impacting a community (for example, polluting a water body) and possibilities for how the problem might be resolved.
- Mapping can help communities plan for sustainable resource management within their territories. It allows communities to collectively examine areas with resource use problems and devise methods for resolving them.

Participatory land use mapping is usually a relatively overt process, requiring community members to come together to document their land and resource use practices. In the current context within Myanmar, this may not be safe. If this is the case, CSOs can help communities carry out remote sensing (as featured in Section 7.4) to record data without needing communities to carry out activities on the ground.

Resources for mapping	
Mekong Region Land Governance’s “Documenting Customary Tenure in Myanmar: A Guidebook”	A Burmese language guide for conducting customary tenure documentation. It does not include a GIS component, but it is a comprehensive methodology for conducting participatory research into land tenure practices.
Mapping for Rights	A set of tutorials (videos and PDFs) to help practitioners conduct GIS participatory mapping.
MAPEO	An innovative mobile app designed with indigenous environmental defenders to map and document lands and resources.
Map Builder	An easy-to-use tool that enables users to combine their datasets with Global Forest Watch’s remote sensing tool.
Food and Agriculture Organization of the United Nations’ “Rapid Appraisal for Land and Forest Tenure”	A guide for practitioners to conduct research into land and forest tenure.

Resources for mapping	
Terrastories	A web application for communities to map, protect, and share stories about their land. Individuals or communities can use it to connect audio or video content to places on a map.

7.4 Remote sensing

What is remote sensing?

Remote sensing is the process of monitoring an area or landscape by using images that have been collected by satellites or aircraft. Satellites take images across the earth's surface on a regular basis, providing up-to-date (2 to 3 days old) images of landscapes. Satellite images can usually be acquired for free, often with a 3-4 meter resolution, to track changes in lands, forests, and oceans. Current applications of remote sensing include tracking forest fires and areas of deforestation or mining activity, predicting weather changes, or monitoring changes to landscapes over time.



Why use remote sensing for environmental monitoring?

Remote sensing can be useful for environmental monitoring of areas that communities and CSOs cannot get access to (for example, conflict sites or mines that are highly securitized) and tracking changes to a landscape over time (for example, looking at the expansion of gold mining operations). This can provide hard evidence of environmental harms, helping to aid local planning processes and contributing towards advocacy efforts.

Example of tracking mine expansions over time in Tanintharyi Township



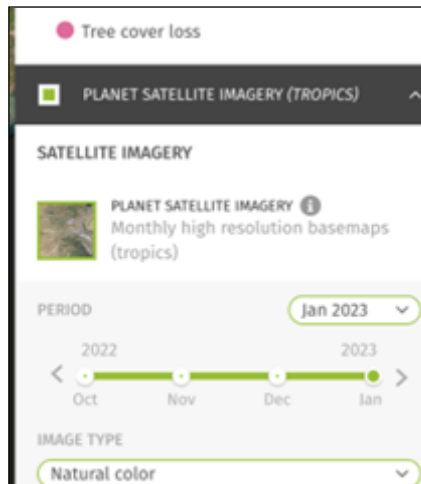
How to use remote sensing? What are the available platforms, and what are the constraints?

- Remote sensing requires a good internet connection and should, therefore, be conducted from a location with fast internet access. This may only be possible outside Myanmar. It should also only be performed from safe and secure locations, using either an encrypted server or a Virtual Private Network (VPN).

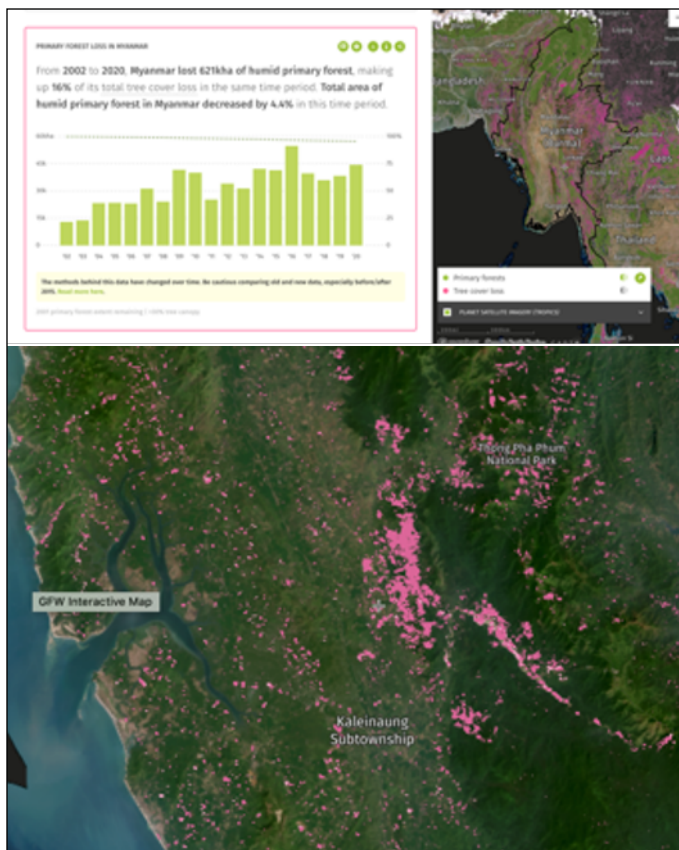
- While some platforms are intuitive, many require some technical knowledge. There are some resources to help CSOs and communities learn how to use remote sensing technologies. Where individuals with technical skills are not available, CSOs should seek the support of those with technical skills.
- The most accessible platform for remote sensing is [Global Forest Watch](#) (GFW), which has monthly satellite imagery that can regularly track changes to forests and land use over the past four to five years.
- GFW records deforestation within 10 years, showing trends and areas of significant forest loss and degradation. The platform provides an excellent spatial analysis of deforestation, with statistics and analysis available for Myanmar and for specific states, districts, and townships.
- GFW provides alerts when areas of deforestation are tracked. For example, [see](#) the deforestation that has taken place in Myanmar.
- The GFW website includes [tutorials](#) for users, showing the different uses of the platform.
- There is an online tutorial with Burmese language subtitles [here](#).



Remote sensing with Planet/GFW



GFW allows looking at satellite imagery over 4-5 years



GFW's deforestation analysis

Resources for remote sensing

[Global Land Analysis and Discover \(GLAD\)](#) (Free to use)

GLAD holds good forest loss analysis using Hansen data and can calculate forest disturbances and loss over the past 10 years. GLAD also analyzes land use and water changes and provides deforestation alerts.

Resources for remote sensing	
Map Hubs (Paid service)	Map Hubs is a paid service that helps map palm oil and agribusiness expansion and analyze value chains (including upstream investors and downstream consumers). It also has a forest alert function. Map Hubs collaborates with activists and CSOs worldwide.

7.5 Desktop stakeholder research

What actors are operating in your area? Are they private companies? Who manages and owns the companies? Do they have investments from international sources? Where are they sending resources that they extract? Do companies or upstream investors have safeguards or performance standards?

These are critical questions to understand what the operation is, how it is operating, what communities might have for redress, and the risks that they face. Doing desktop stakeholder research can reveal additional information that can help communities gain more leverage over a company or operation. There are different sources of information that communities and CSOs can monitor to gain more information.

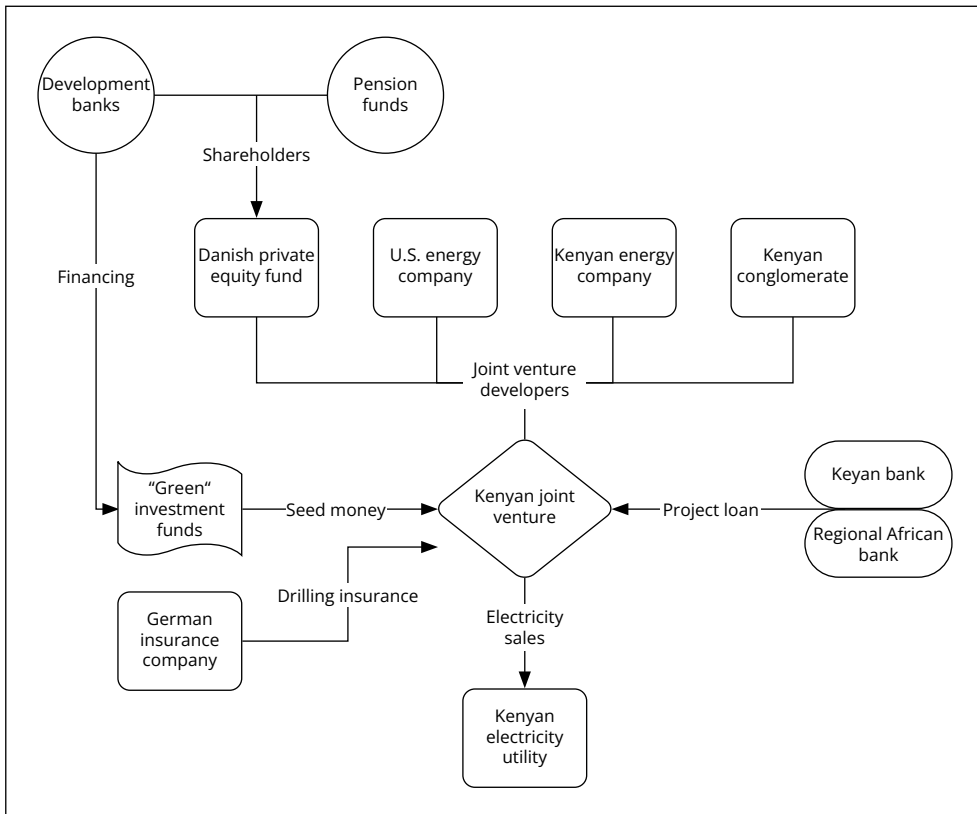
Resources for desktop stakeholder research	
Google searches	Searching using the existing information a community has about an operation can be a good starting point for finding out more information on the project and its operator.
Journals and newspapers	Looking through journals and newspapers may provide more information on an operation or some of the companies or investors involved in it.
Company websites	Company websites are an excellent way to learn more about a company's operations, the people managing it, and its ownership structure. They might also have information on partners, investors, and other operations that a company is involved in. Even if a company has taken down its websites, they can still be accessed online using the Wayback Machine .
DICA registration	If a company is registered in Myanmar, the Directorate of Investment and Company Administration (DICA) website will record information about the company. This includes who its directors and shareholders are. Details of foreign companies can be found in similar online company registries in their home countries.

Resources for desktop stakeholder research	
Social media (LinkedIn , Facebook, etc.)	Social media, especially LinkedIn, are good resources for finding more information about company staff, including what other ventures they are involved in.
Open data sites	Open data sites and resources, including: <ul style="list-style-type: none"> • Open Development Mekong • Open Corporates • Myanmar’s Extractive Industries Transparency Initiative reports • United Nations Commodity Trade Statistics Database
Stock exchanges	If a foreign company is involved, it may be a public company registered on a stock exchange with accessible information on its finances, investments, and transactions.

7.6 Follow the money

Desktop stakeholder research can be taken further with “follow the money” techniques. Follow the money is a series of techniques that helps communities analyze investments that are impacting them and identify and target relevant stakeholders. Operations generally have a number of different “upstream” and “downstream” stakeholders that may be exposed to greater risk

that can be leveraged in order to reduce impacts and even gain redress for affected communities. These include investors, buyers, and contractors — where these are from overseas — leverage will be easier to find.



Mapping of the company supply chain. Source: IDI

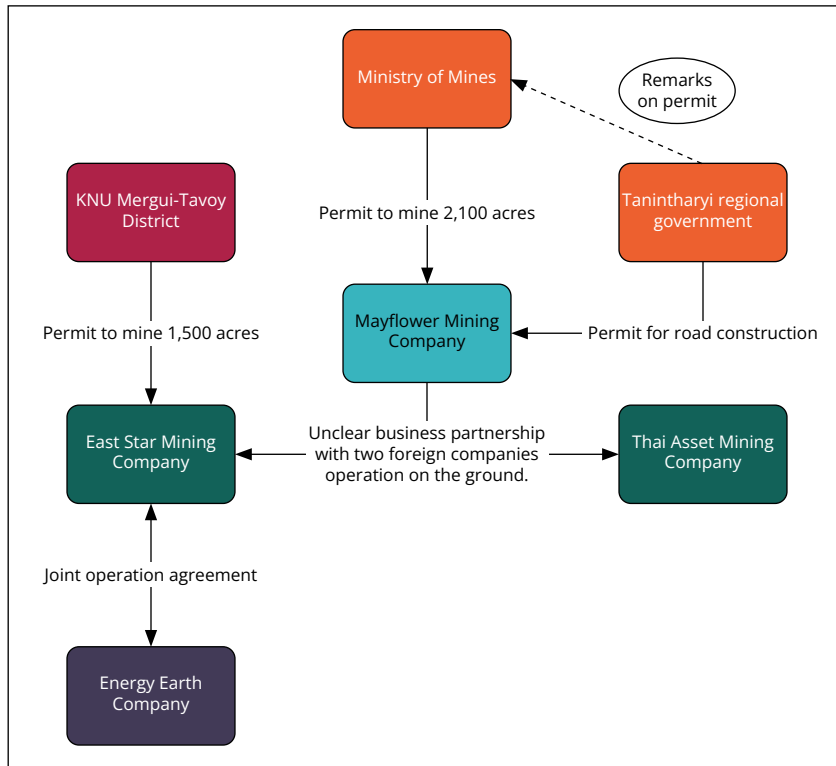
Following the money helps communities look at the entire value chain, identifying upstream investors and lenders, downstream buyers, subcontractors, and parent companies involved with the project. Based on this information, environmental defenders can create targeted advocacy strategies that address critical actors

involved in projects. Ultimately, it may be possible to carry out advocacy and bring grievance complaints or lawsuits against stakeholders in other countries. The follow the money or investor chain mapping toolkit can be found [here](#), and another report on this method is [here](#). A follow the money analysis that identifies advocacy targets can help inform a community's decision on why, if, and how they want to carry out monitoring.



Case study: Ban Chaung coal mine

The map below shows entities involved in the Ban Chaung coal mine, a 2,100-acre coal mine located in Dawei District. A follow the money research found Myanmar's regional and central governments and the Karen National Union (KNU) permitted Thai sub-contractors and two Thai investors linked to the mine. Communities were able to engage with Thailand-based investors to disrupt payments. The operation was later suspended, and the primary investor liquidated.



Web of corporate abuse

Collecting information on Chinese companies

Chinese companies operate differently from western companies, so data is often more difficult to find. There are, however, still strategies for finding more information and engaging with companies or their counterparts in the government. This [report](#) has information on how to conduct investor chain mapping with Chinese companies and also some ideas on how advocates can engage with Chinese companies.

Annex 1: Case study of gold mining on the Mali Hka River

The following case study has been devised for this toolkit. It does not represent actual villages or events. The case study intends to provide a short illustration of a basic project impact timeline and the kinds of information that communities might then consider collecting. The information that communities and CSOs decide to collect will depend upon the specifics of each project.

Context

Ywa Thit is located along the Mali Hka River. The community depends upon the river and its nearby tributaries as their primary water source, and their rice and vegetable fields are located along the banks of the river. While there is a long history of gold mining around the village, with some members of the community participating during the summer months, the number and size of gold mines in the area since 2021 has increased substantially. A number of militias have authorized gold mines in the area and received investment from larger companies for heavy machinery and equipment.

Close to the village, a gold mine operates on the banks of the river, using generator-powered hoses to wash away sediment on the riverbank. There are approximately 20 workers at the site, and community members have started to feel negative impacts.

Community members have found that there are growing problems of soil erosion around their agricultural lands, increasing pollution in the river as a result of mercury¹ use, and increasing social issues such as drug use within the community.

The community decided to monitor the impacts of the mine with the support of a civil society organization that provided technical support and helped to document the changes in the community safely.

Project timeline	
November 2021	Company directors, militia, and SAC representatives visit the site. The village head gets the information that a mine will be established in the next few weeks.
December 2021	Operations start at the site. Fifteen workers arrive and set up a temporary settlement. The operation has two backhoes, 5-6 heavy hose pipes, and other machinery.
January 2022	Community members start to feel the mine's impacts. The stream they rely on becomes cloudy, some of the forest has been cut down, and loud noises come from the site at night.

¹ Mercury is a neurotoxin that can cause significant damage to the brains of those who come into contact with it, particularly among children and developing fetuses. The symptoms could be dizziness, headaches, insomnia, as well as respiratory or renal problems.

Project timeline	
March 2022	Community members notice soil erosion around their farmlands as the mine starts to spread. The soil is dry, with cracks around agricultural lands, and crops are also beginning to suffer. The community also noticed that fish numbers are starting to reduce — those who depend on fish are finding it difficult to catch enough to sustain themselves.
April 2022	SAC and militia erected new checkpoints and tax gates around the mine site. One of these checkpoints crosses the main entrance into the village. This makes transportation more difficult for community members trying to trade their goods or move around, and many villagers become scared.
June 2022	A landslide takes place, destroying 10 acres of community farmland. No compensation is given, and the mine pit grows.
August 2022	The rainy season results in more landslides. Tailing pools also burst, flooding rice and vegetable fields. Floods destroy some areas of agricultural fields, and no compensation is given for losses.

Project timeline	
October 2022	Four children in the village started to feel dizzy and kept getting headaches. The community suspects this might be because of mercury in the water from the gold mine and fish in the river.
November 2022	One child is taken to hospital with bad headaches.
December 2022	A new gold mine has been established on the other side of the village. Villagers note that crop harvest is below previous years' yields.

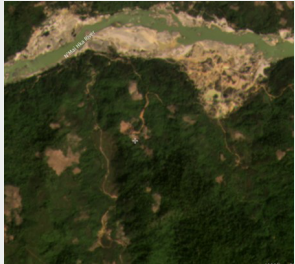
Ongoing monitoring questions

Community monthly monitoring observation: Collected [insert date]		
Issue	Indicator	Observations (include all relevant details)
Soil erosion and land issues	Square feet of land that has been impacted (dry, cracked)	
	Number of new landslides	
	Square feet of land lost due to landslides	

Issue	Indicator	Observations (include all relevant details)
	Number of houses reporting reduced rice/vegetable yields	
	Number of households/area of land lost to expanding mining operations	
Water quality/ quantity	Color of water	
	Water level (feet)	
	Does the community consider the water to be safe to drink/ cook/wash?	
	Number of floods per month	
	Number of fishermen reporting reduced number of fish	
	How many times have mine tailings been dumped into the river?	
Health impacts	Number of people reporting breathing problems	

Issue	Indicator	Observations (include all relevant details)
	Number of people reporting headaches	
	Number of people reporting Dizziness	
	Number of people reporting rashes and skin ailments	
	Number of miscarriages or other reproductive health issues in the community	
Resource extraction	Number of checkpoints/ tax gates	
	Number of trucks with gold ore	
	Number of trucks with logs passing through the village	
Social issues	Presence of drugs within the community; number of known cases	

Remote sensing images from GFW



Feb 2021



Feb 2022



Jan 2023

Annex 2: Checklist for compiling a project impact timeline

This checklist can help with creating a project impact timeline as set out in Section 7.2.

If CSOs are speaking to community members to collect information, it can be helpful to start by asking community members to share information about the project and its impacts without too many interruptions. Once community members have shared an overview,



CSOs can then use this checklist to help ask more specific questions. This may take multiple meetings or, if safer, calls using a secured app. Alternatively, community leaders can use this checklist themselves if it is safe to do so.

Community members using this checklist to record or share information with CSOs should include as much detail as possible. For example, if the question is “Has the water quality changed?”, include details of what it was like before it started changing, how it has changed over time, and where the worst impacts are. This can consist of information on the color, smell, taste, and amounts of sediment.

CSOs can support this process by asking follow-up questions. If the checklist question has a “yes” or “no” answer (a “closed” question), CSOs can follow up with questions like: When? How? Who? What? Where? These are “open” questions and will help collect more information.

All information in this checklist can be collected from the affected communities, and community members should not need to enter mine sites or unsafe areas in order to collect information (see Section 6).

Governance

- What authorities govern the area where the project is taking place?
- Does the operation have authorization from these authorities? If so, do you know what type of authorizations? Does the company have a permit? If so, what kind of permit does it have?
- What relationship does the company that operates the project have with these authorities?
- Is the area impacted by armed conflict?
- Are there other industries that are set up after mining operations? Which one?

The operation

- What type of project is it?
- Do you know who the company owner is? Are there any other key people?
- Who is operating, investing, or involved in the project? This could be individuals or companies.
- What is the size of the operation? What is the approximate number of acres?
- What stage is the project at (e.g., exploration, operation, closure)?
- How has the project developed over time (including when / how it has changed or grown)?
- What sources of power is the project using?
- For mining projects:
 - What minerals/resources are being extracted?
 - What kinds of machinery are being used (size/type/ number)?
 - Are chemicals/processing substances being used? If so, what (e.g., mercury, cyanide, sulfur dioxide)?

Value chain

- Where are resources being transported to/ sold?
 - How are the resources being transported?
 - Who is involved in transportation and sales?
 - What is the price of the resources?
-

Free, prior, and informed consent, consultation, and community conflicts

- Have there been any consultations with the community by company representatives or local authorities?
- Has there been an environmental impact assessment, and if so, what was the process?
- Have there been any agreements between anyone in the community or local area, as well as company representatives or local authorities? What are the details of these?
- Were any members of the community coerced into agreeing to the project?
- Did community members feel free to withhold consent for the project?
- Has the project caused any divisions or conflicts within the community?

Forests

- What type of forest is the operation located in (e.g., is it a reserved forest, community forest, protected area, or customarily managed forest)?
- What is the forest's significance for the community? Does it support local livelihoods? What resources or products



do community members gather? Does it have spiritual significance, etc.?

- What types of resources have been extracted from the forest? (teak, ironwood, rosewood, other resources)?
- How many trucks of logs have left the area (per day/week)?
- What direction are trucks moving in? Do you know where timber is being transported to?
- What impacts have community members seen in the forest? Is there a loss of species or destruction of biodiversity?
- What impact have company operations had on the community's access to and use of the forest?

Water

- What water sources are being used by the community? (pipe, well, rain, river, other).
- Have you seen a company using or dumping waste into community water sources?
- Has the quality of water changed in wells, creeks, or ponds? How? (Record sediment, color, smell, taste, etc.).
- Has the flow and quantity of the water changed? (Look out for the water flow, the water level, sediment, and flooding)




- What do you use the body of water for (drinking, washing, transport, etc.)?
- Have the vegetation, populations of fish, and other aquatic animals changed? What changes have you observed?
- Have community members experienced any difficulties in using the water? (not enough water, no longer suitable for drinking, bathing, or irrigation, etc.).
- Can the community still use the water source, and if not, to what alternative water sources does the community have access?

Waste management

- Where does the company dump mining tailings and other forms of waste?
- Is waste affecting water supplies or agricultural land?
- What impacts do waste piles or mine tailings have on local land, water, or air quality?
- What plans or regular practices does the company have for dealing with mine tailings and waste?

Air quality and noise

- How has the air quality changed, such as dust or bad smells?
 - How are community members affected by noise from the operations?
- 

Land quality

- What kind of land is the operation located on (agricultural land, village land, forest land, etc.)
- What land mapping has the community done?
- Have there been any changes to the soil quality?
- Have you seen any soil erosion (where the soil is being washed away by rain or rivers)?
- Have you seen any drying or cracking of land?
- Has there been any subsidence (where landslips downhill) or landslides?
- Has there been any observable impacts on agricultural lands? This could include crops dying or land producing less crops.



Land use and access

- Have community members been forced to relocate, or has any land been confiscated by the company or authorities?
- What kind of land was lost (agricultural land, village land, forest land, etc.)?



- What policies, processes, or practices did they use to confiscate the land?
- Was any compensation provided for land that communities have lost access to, and how was this calculated? How satisfied were community members with it?
- Has the community lost access to any other areas of land, including communal lands, forests, and fisheries?
- Have any community members had to move or change their land use as a result of the operation?
- Have community members been pushed to sell their lands?

Community health

- What health issues have community members experienced since the project started?
- What kinds of symptoms do they have?
 - Difficulties in breathing?
 - Neurological issues (these might include forgetfulness, headaches, dizziness, and depression)?
 - Pains in kidneys or pain when urinating?
 - Rashes or skin ailments?
 - Miscarriages or other problems with pregnancies?



- How many community members are facing health difficulties, and where do they live in proximity to the operation or waste areas?
- What different issues are women, children, and marginalized groups facing?
- Do community members think their health issues are linked to the project, and if so, why?

Interactions with the company or authorities

- Has the community had any confrontations or contact with authorities or the company? Please explain. This could include an environmental impact assessment process, informal consultations, or complaints by community members.
- Have the community or others experienced violence or threats of violence or intimidation by the company or authorities?
- Have community members been stopped at checkpoints? Were they threatened?
- Have community members reported human rights violations anywhere? What happened?



Social issues

- Have the community experienced any conflicts or divisions within their community? What different views do community members have about the project?
- Have community members had to leave their community?
- How has the operation impacted community livelihoods and traditions (any positive impacts, such as job opportunities, or adverse effects, such as difficulties for agricultural livelihoods)?
- Have there been different impacts on women?
- What job opportunities or income levels are accessible to women?
- Has there been an increase in domestic violence?
- Have there been any adverse impacts on landless people in the community?
- What is the situation for ethnic minorities?
- Are there migrants in the community? What are the impacts on the host community?

Annex 3: Ongoing monitoring checklist

This ongoing monitoring checklist is an exhaustive list of environmental and social issues that communities may want to consider when building their own ongoing monitoring system, as set out in Section 7.2. It is unlikely that all of the problems will be relevant, and communities should work with CSOs to select relevant ones. This might be based on a Projects Impact Timeline as set out in Section 7.1 (which may have been compiled using questions from Annex 2). A community can choose indicators that best suit the project they are monitoring. The case study in Annex 1 shows an example of the type of indicators that a community might select.

Most issues can be monitored from within the community by speaking to other community members and observing the condition of the surrounding environment. These observations and discussions can provide a substantial amount of information to start building a body of evidence. Community members can collect monitoring data on a bi-weekly or monthly basis (whichever makes sense for the community). This will show changes over time. Where possible, the monitoring should record the location of observations, as this helps to show patterns and causes of the changes and impacts.

Indicators	Notes
1. Health impacts	
<p>Physical health</p> <ul style="list-style-type: none"> • Breathing problems • Skin rashes • Miscarriages • Deaths • Disability • Injuries • Others 	<p>If it is possible, record details for the following:</p> <ul style="list-style-type: none"> • Symptoms • Gender and age • History of the health issue • Location of household • Number of people in the communities who are facing health issues • Doctor referrals, if there are any
<p>Neurological health</p> <ul style="list-style-type: none"> • Headaches • Depression • Dizziness • Forgetfulness • Others 	<p>If it is possible, record details for the following:</p> <ul style="list-style-type: none"> • Symptoms • Gender and age • Timeframe since when • History of the health issue • Location of household • Number of people in the communities who are facing health issues • Doctor referrals, if there are any

<p>Child health</p> <ul style="list-style-type: none"> • Dizziness • Skin rashes • Respiratory • Speech problem • Attention issue • Others 	<ul style="list-style-type: none"> • Collect information about the number of children facing illnesses and when they started. Heavy metal pollution, such as mercury and lead, impacts children and pregnant women disproportionately. • Ask teachers in the village if they have seen any changes in their students.
<p>2. Impact on water bodies</p>	
<p>What are the primary water bodies in the community, and which water sources do households use for drinking and household use?</p> <ul style="list-style-type: none"> • Stream • River • Lake/pond • Creek • Others 	<p>Write the names of the water bodies, including their local and official names. If you can get the GPS point, note it down.</p>
<p>Water quality and flow</p> <ul style="list-style-type: none"> • Have there been changes to the color? Please describe. 	<ul style="list-style-type: none"> • Have there been any observable changes to water quality?

<ul style="list-style-type: none"> • Have there been changes to the water level or flow of the water? • Are community members still using the water source for drinking, washing, and other things? • Presence of siltation (is water cloudy or dirty from mining?) • Have mine tailings been dumped into water sources? How many times? • Others 	<ul style="list-style-type: none"> • Are there any changes to the color or smell? • Any changes to the flow or quantity of the water body?
<p>Water access and use</p> <ul style="list-style-type: none"> • Does the community consider water safe to drink? Why? • Can people still travel on water (with boats, etc.)? • Impact on water used for agricultural purposes. • Is there a presence of dead fish or aquatic animals? If so, take a photo. • Are communities still fishing? How have catch yields changed? • Others 	

3. Impact on land

Changes to the soil, particularly for agricultural purposes

- Is there a presence of soil erosion? Is the soil dry? Are there cracks? Is it still suitable for cultivation?
- Is soil still good for farming? Are there areas where it has worsened?
- Are there changes to the color of the soil? How?
- Have there been any landslides? If so, how many and where?
- Others

- Has there been any erosion of soil as a result of the project?
- Have you noticed any difference in soil quality?

Landslides

- Loss of agricultural lands
- Destruction of properties
- Roadblocks
- Arid/uncultivable land
- Injuries to community members
- Loss of livestock
- Others

<p>Quality of agricultural land</p> <ul style="list-style-type: none"> • What changes have crop yields experienced? Why? • Describe any effects on agricultural lands due to: <ul style="list-style-type: none"> ◦ Flooding ◦ Dust ◦ Dumping of chemicals 	
<p>Land confiscations and loss of land access</p> <ul style="list-style-type: none"> • Land confiscations and loss of land access • Have there been any land confiscations? • Has the land been polluted, flooded, or damaged? • How much household land has been lost? What is its value? • How much communal land has been lost? What was it used for? • Other 	<ul style="list-style-type: none"> • Have any community members lost access to land? This could include communal land. • Have any areas of land been confiscated? • Has the land been polluted or damaged?

<p>How many acres has the community lost access to?</p> <ul style="list-style-type: none"> • Communal land • Forest land • Household land • Orchard land • Farmland • Other 	
<p>Compensation or resettlement</p> <ul style="list-style-type: none"> • Have any community members been resettled? • What is the condition of resettlement? • Have any community members been compensated for losses? • How much per acre? 	
<p>4. Impact on forest and wildlife</p>	
<p>Types of forest</p> <ul style="list-style-type: none"> • Community-managed forest • Forest within/outside community boundary • National park • Reserve forest • Others 	

<p>Significance of the forest</p> <ul style="list-style-type: none"> • Rainforest • Mangrove forest • Primary/natural forest • Important ecosystem • Vulnerable wildlife species • Significant cultural or spiritual practices • Firewood/ non-forest product collection • Plantation/agro-forestry • Others 	<ul style="list-style-type: none"> • Does the forest area contain any rainforests, mangrove forests, primary forests, or other important ecosystem? • Does the area contain vulnerable wildlife species? Please explain. • Does the forest have any cultural or spiritual significance? • Please explain in detail.
<p>Deforestation and forest degradation</p> <ul style="list-style-type: none"> • Has there been logging in the forest? • Is it clear-cut, patch, selective, or other types of deforestation? • Have old/large trees been extracted? • Has logging taken place near rivers and streams? • Has forest cover changed? • Has there been any changes to the presence of wildlife? 	

<p>Forest condition, use, and access</p> <ul style="list-style-type: none"> • Have community members lost access to resources or forests? • Have there been any forest fires? • Has there been drought or soil erosion in the forest? • Has there been an expansion of the plantation or other concessions? • Others 	
<p>5. Air pollution</p>	
<ul style="list-style-type: none"> • Is there any smoke or fumes coming from the resource extraction site? • How many times have communities experienced this each month? • Where are fumes coming from? • Do community members experience breathing problems because of fumes? • Is there a significant presence of dust from the operation? Where is it coming from? 	

<ul style="list-style-type: none"> • Is there noise pollution coming from the site? What time is it happening? • How is it impacting community members? 	
6. Social impacts	
<ul style="list-style-type: none"> • Numbers of households who have lost livestock. How many were lost? • Households that have lost properties and the value • Loss of access to the forest, water, land, or transportation route • Others 	<p>Please explain the impacts on the local livelihood in as much detail as possible. How many families or individuals are impacted? Also, if possible, try to assess the value of losses where they occur.</p>
<p>Livelihood loss</p> <ul style="list-style-type: none"> • What has been the impact of livelihood losses? • Has there been an increase in poverty? • Has this caused migration? • Is any compensation for livelihood losses available? • Others 	

Human rights violations

- Has the community been exposed to human rights violations?
 - What kinds of human rights abuses have been observed?
 - Forced labor/labor extortion
 - Child labor
 - Forced eviction
 - Threat/intimidation
 - Violence, including domestic violence
 - Sexual abuse/harassment
 - Theft
 - Robbery
 - Others
 - Who are the actors involved in human rights violations?
 - SAC
 - Companies/businessmen
 - EROs
 - Militias/BGFs
 - Others
- If possible, please count the number of cases or people, both male and female, whose rights are violated for each type.
 - A case study will be good to record as well.

<p>Other social and family problems</p> <ul style="list-style-type: none"> • Divorced/broken family • Domestic violence • Social exploitation • Sex work and exploitation • Drugs • Others 	<p>If there is any indicator or source of cause, it should be recorded.</p>
<p>Any other social problems</p> <ul style="list-style-type: none"> • Drug use • Theft • Robbery • Organized crime • Communal conflict • Gambling/KTV in areas • Sex entertainment activities • Increased in- or out-migration • Others 	
<p>7. Company, operation, and value chains</p>	
<p>Extraction and value chains</p> <ul style="list-style-type: none"> • How many trucks carrying resources have passed? • How big are trucks? • What resources are they carrying? • Where are they being taken? 	

<ul style="list-style-type: none"> • Who is transporting resources? • Others 	
<p>Interaction with the company</p> <ul style="list-style-type: none"> • Does the community have any interactions with company representatives or authorities? How many times? • What kind of interaction (consultation, meeting, discussion, etc.) • Who was present at the meeting? • Have there been any threats or intimidation? • Were any problems resolved, or were the next steps agreed upon? • Others 	

Annex 4: Specific impacts for different types of mining

Gold mining

Mercury is used to process ore in most alluvial small-scale gold mining operations in Myanmar. It is a neurotoxin that can have severe physical and neurological impacts on humans, particularly on young children and pregnant women. It can also contaminate water sources, bioaccumulate by building up inside animals over time), and pass up the food chain. This means it can have severe impacts on large fish, birds, and mammals, as well as on people who eat them. Mercury can enter the body through ingestion or inhalation, including when it is heated as part of processing artisanal gold mining, which is often done in the home by women.

Some impacts of mercury pollution to look out for are:

- **Neurological impacts and symptoms**
 - Tremors, particularly impacting hands, fingers, and eyelids
 - Insomnia or difficulties in sleeping
 - Headache
 - Memory loss
 - Cognitive and motor dysfunctions or difficulty with coordination skills, such as writing, doing buttons, or gripping small objects

- Visual or hearing impairments
- Emotional instability and mood swings


- **Physical impacts and symptoms**
 - Kidney pains and failure
 - Skin changes and rashes
 - Gastrointestinal issues, such as vomiting or abdominal pains
 - Skin changes, rashes, and inflammation
 - Respiratory impacts, such as difficulties breathing, coughing, lung inflammation
 - Hair or nails falling out
 - Miscarriages or problems with child development
 - Weight loss
 - Poor blood circulation

- **Observable environmental impacts**
 - Pollution of water bodies (mercury can often be found on the riverbed and sometimes can be observed through discoloration of water — it becomes yellow/brown or cloudy)
 - Decline in fish populations and slower reproduction
 - Abnormal fish behaviors, such as swimming close to the surface or swimming in loops
 - Reduced fish size
 - Impairment and decline in animals that depend on fish

- Stunted growth of plants and trees in areas in which there is mercury pollution
- Metallic odors

Coal mining

Open-pit coal mining is associated with a range of severe health and environmental threats. Coal contains a number of heavy metals, including mercury, lead, arsenic, and cadmium, which are released through smoke and tailings and can have severe health and environmental impacts. Further, smoke from coal mines and waste piles can lead to serious respiratory problems among communities. Acid mine drainage is also a common occurrence around coal mines, which can result in lasting environmental issues. Some impacts to look out for are:

- **Pollution from lead, mercury, arsenic, and cadmium**
 - Neurological impacts, including tremors, memory loss, cognitive problems, headaches, visual impairment, and emotional instability
 - Skin rashes and blemishes
 - Gastrointestinal issues, such as vomiting or abdominal pains
 - Kidney pains or failure
 - Miscarriages or fetal development problems
 - Poor blood circulation
 - These symptoms may be exaggerated in young children
- 

- **Air pollution from fires in mining waste heaps and particulate matter**
 - Respiratory issues, including issues such as asthma and bronchitis
 - More cases of lung cancer
 - Circulatory problems, such as high blood pressure, heart attacks, and strokes, are more common
 - Bad smells and irritation from smoke from burning coal
- **Environmental threats**
 - Acid mine drainage, including high acidity in water sources, contamination of ground and surface water, harm to aquatic animals due to the presence of dead fish, and change in the water's color.
 - Soil erosion and sedimentation
 - Habitat destruction
 - Groundwater depletion

Rare earth mining

Rare earth mining presents high risks to nearby communities as well as the surrounding environment. Rare earth mining can generate dust and particulate matter containing harmful substances such as thorium, uranium, and other radioactive elements. Exposure to these elements can result in the radioactive contamination of the environment and surrounding ecosystems, and leading to severe health impacts on workers and

surrounding communities, such as cancer, genetic mutations, neurological disorders, and respiratory issues. Rare earth mining can also have serious environmental impacts, such as contaminating water sources and aquatic life with harmful heavy metals, acidic materials, and radioactive substances. Further, it can have major implications on surrounding landscapes, such as destroying mountains and rivers.

- **Health impacts**

- The release of harmful dust and particulate matter containing toxic heavy metals and radioactive elements cause respiratory issues/ breathing problems. Long-term exposure can also lead to lung cancer, silicosis, and other lung problems.
- Contact with rare earth metals and chemicals cause skin and eye irritation.
- Radioactive contamination can lead to health risks for workers and surrounding communities, including cancer or genetic mutations.
- Exposure to heavy metal cause neurological issues. This might include mood swings, tremors, memory loss, headaches, sensory losses, and motor dysfunctions.
- Waterborne illnesses, such as diarrhea and gastrointestinal problems.

- **Environmental impacts**
 - The removal of topsoil and vegetation results in the degradation and loss of fertile land, disrupting local ecosystems and impacting surrounding biodiversity.
 - Chemical spills, leaks, and inadequate wastewater treatment pollute rivers, lakes, and groundwater, harming aquatic ecosystems and affecting the availability of clean water for communities.
 - Deforestation, habitat destruction, and disruption of wildlife corridors lead to the displacement and loss of plant and animal species.
 - Acid mine drainage can contaminate surface water, soil, and groundwater, affecting the pH balance and posing risks to aquatic life and ecosystems.
 - Heavy metal contamination. Heavy metals bioaccumulate up the food chain, particularly in larger fish and animals that prey on them. This can result in declining populations and neurological disorders.
 - Acidic and toxic wastewater, if poorly managed or leached into rivers, can kill fish and aquatic species. If leached into the soil, it can impact soil quality, leading to reduced growth of plants and crops.

