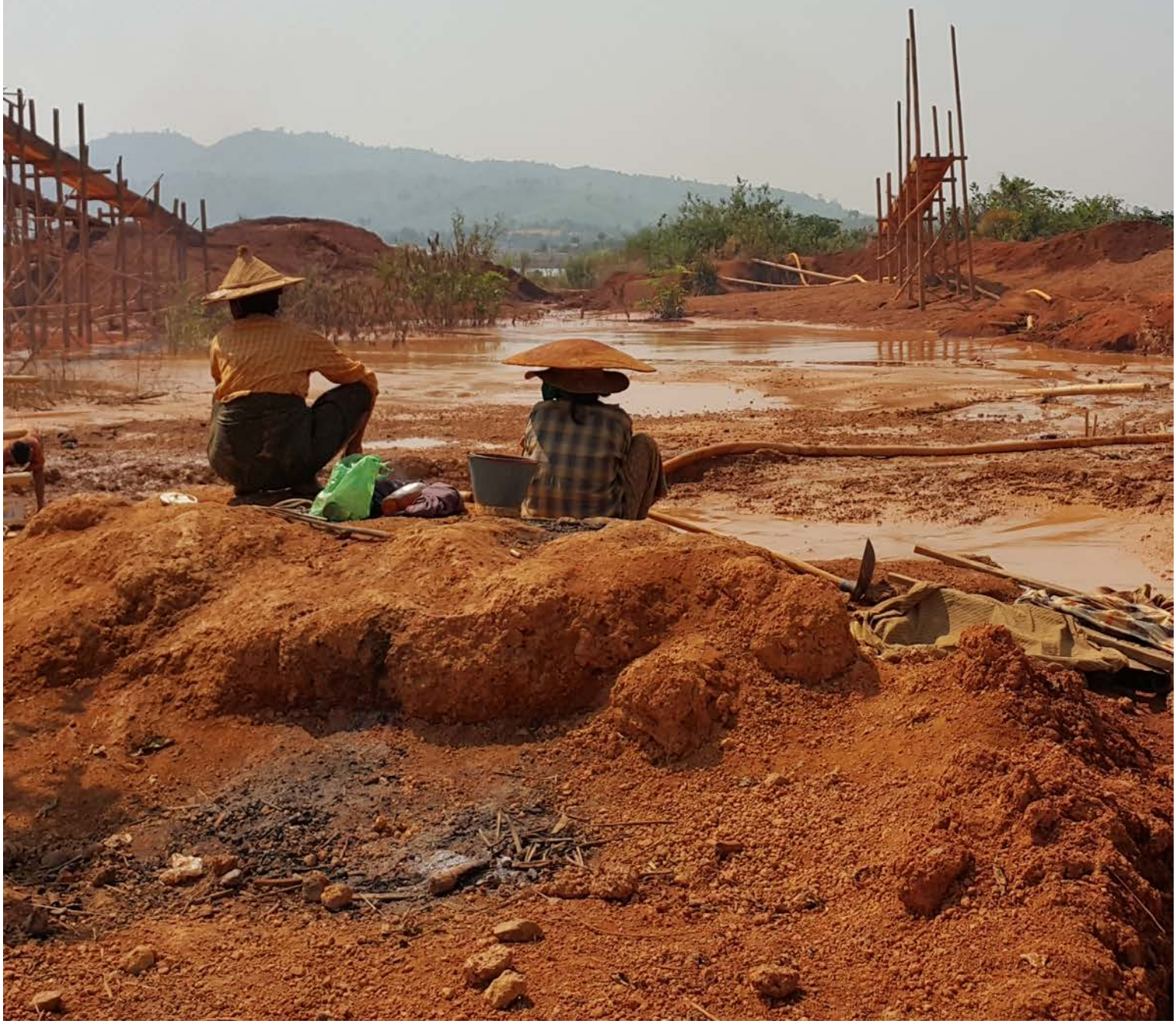
Myanmar Centre for Responsible Business

5.7

Cumulative & Project-Level Impacts

Environment and Ecosystem Services



Part 5.7

Environment and Ecosystem Services

In this section:

A. National Context

At the national level, important environmental challenges include air pollution, water stress and contamination, land degradation, waste management and the depletion and degradation of forest resources. These mirror the mining-related environmental and ecosystem challenges evidenced by MCRB's field research on and nearby mine sites throughout the country.

Legal and policy framework

See Chapter 3 for a detailed explanation of the existing framework for environmental protection. For mining, this is complex, overlapping and also has gaps. The framework derives from Art7 of the 2012 Environmental Conservation Law (ECL) which introduces the requirement for EIA and Environmental Management Plans (EMPs), other laws and directives adopted under the ECL such as the National Quality (Emissions) Standards, cross cutting laws, and sectoral laws relating to Mining. Details of additional laws not covered in Chapter 3 are provided below. A separate online Appendix contains a full list of relevant laws. MCRB will also publish a SWIA supplement on mining and biodiversity in 2018.

Waste management

The 2012 Environmental Conservation Law (Art13c) tasks MoNREC, guided by the National Environmental Conservation Committee, to maintain a comprehensive monitoring system of the disposal of waste generated by mineral exploration, production and treatment. According to the Law, companies are required to install or use on-site equipment in order to monitor, control, manage, reduce or eliminate environmental pollution, and are expected

to discharge polluting substances in accordance with the 2015 Environmental Quality Guidelines (Art14 & 15.). Waste management treatments and precautions may include: infrastructure to collect waste; rendering the operation of other equipment more effective; indicating and recording pollution levels; issuing warnings when levels become excessive; and others. However, the Law also notes that if these solutions are impracticable, it may be arranged to dispose of the waste causing a point source of pollution in accordance with environmentally sound methods, which are not specifically defined but may be understood to be less stringent than the Environmental Quality Guidelines.

Chemicals, including Mercury and Cyanide

The 1919 Myanmar Poisons Act grants the President of the Union the authority to regulate the terms of possession and sale of any specified poison.[436] According to the 2012 Environmental Conservation Law (Art30), permission from the Ministry is required in order to import, export, produce, store, carry or trade any material which causes an adverse impact on the environment prohibited by the Ministry. Myanmar has not signed the Minamata Convention on Mercury. Currently none of the companies in Myanmar are a part of the International Cyanide Management Code (Box 26).

Box 26: International Frameworks on Mercury and Cyanide

Minamata Convention
In 2013, the Minamata Convention on Mercury was adopted under the auspices of the United Nations Environment Programme (UNEP) and entered into force on 16 August 2017. This legally binding instrument is aimed at preventing global environmental pollution and health hazards due to anthropogenic emissions and release of mercury. By becoming members, governments agree to draw up strategies to reduce the amount of mercury used by artisanal and small-scale miners and to facilitate research and monitoring of activities relating to mercury use. Currently, the document has 128 signatures and 74 ratifications. Myanmar has not yet signed the Convention.

International Cyanide Management Code
The International Cyanide Management Code deals specifically with the use of cyanide in the mining industry. The Code was developed by a multi-stakeholder steering committee under the auspices of UNEP and the former Council on Metals and the Environment. It is a voluntary initiative for the gold mining industry and is intended to complement existing regulatory requirements. Companies that adopt the Code commit to follow its principles and standards in the use of cyanide and those operations that meet the requirements are certified and authorised to use its trademark symbol. None of the mining companies operating in Myanmar are currently part of the initiative.

Dynamite and blasting regulation

Use of explosives and blasting is regulated by the 1908 Explosive Substances Act, part of the India Act, and amended by a set of 2001 amendments, as well as Rule 181 of the Mines Rules (previously Rule 105 of the almost identical 1996 Rules). The Ministry of Defence

[436] 1919 Poisons Act, Article 2

(MoD) regulates the storage and use of gun powder on mine sites. Dynamite is not allowed in mine or quarry operations without written permission from DoM or one of the SOEs. ME-2 reports permissions granted to MoD. If the request is approved, ME-2 will issue an approval letter authorising the company to procure explosives from a military storage facility in a nearby township. Army personnel and vehicles will provide security for the company during transportation of explosives from the military to the company storage unit located on the mine site.

According to Mines Rule 181a, explosives may only be stored in accordance with the recommendations of the Magazine Location Selection Committee of the MoD. Companies have to submit monthly records of their use of explosives to ME-2 or other relevant authority or SOE. Mines Rule 181 require a mine permit-holder to ensure that anyone in the vicinity is given due warning prior to any blasting being carried out underground. This also includes a requirement to guard the entries to sites at which blasting is being undertaken.

Regulation of water use by mining

Rapid growth in demand for water due to population growth, urbanisation and industry use pose serious challenges to water security in Myanmar.[437] The Myanmar National Water Resources Committee was established in 2013 to ensure a coordinated national approach to water resource issues.[438] In 2014, the Committee adopted a policy framework entitled, the National Water Framework Directive, modelled on the EU Water Framework Directive. The Myanmar National Water Framework Directive includes issues such as sustainable river-basin management, the ecological status of water bodies, and principles for stakeholder inclusion.[439] It also sets a target for Myanmar to become a water efficient nation based on the International Water Resources Management principles by 2020.[440]

Rule 153 of the 2018 Myanmar Mines Rules imposes an obligation for mining permit-holders to take precautions not to deprive "*any other person of the water [to which] he is accustomed."*[441] Permit-holders need to obtain permission to use a public water source from the DoM Regional or State Plot Scrutiny and Issuing Team. They must not alter any water course without obtaining prior permission from the relevant government department or agency (see below). Where a permit-holder needs to use public water for mineral production, DoM needs to approve this through a separate application process and the applicant must indicate daily and yearly volumes of public water needed.[442] A definition of 'public water' was not included in the 1996 Mines Rules or the 2018 update, and no definitions contained in other laws are referenced.

Rule 154a (unchanged from 1996 Rule 73a) allows mining licence-holders to take and use water that is not 'public water' within the Permit area without charge. It requires them not to pollute the environment (Rule 154b) and to maintain water quality above and below ground (Rule 154c).

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[437] FAO, Assessment of the National Water Policy of Myanmar
[438] Water Solutions, Myanmar: Pilot introducing the National Water Framework Directive, 2016
[439] Ibid, p. 1
[440] Ibid, p. 22
[441] Rule 72 of the 1996 Rules
[442] 1996 Mining Rule 71(a) and (b)

It was not clear from MCRB field research and desk review of law and policy that the Department requires and reviews any hydrological study prior to approving requests to use 'public water' from mining companies. Without such studies, it is not clear on which basis permits are granted. The extent to which the water extraction of projects may affect communities' access to water, or the consequences of water usage for downstream users, also appear not be thoroughly evaluated by the relevant authorities. These impacts should be evaluated under an effective IEE/EIA process.

Mining near and in waterways and rivers

The 2006 Conservation of Water Resources and Rivers Law[443] grants the Directorate of Water Resources and Improvement of River Systems of the Ministry of Transport the authority to review whether rivers or creeks could be adversely affected by mineral extraction and issue recommendations to the relevant government department (Art 5g). Sand suction, sand dredging, sand excavating, river shingle suction, panning for gold, gold mineral dredging or resource production are prohibited from sandbanks or channels which are used for controlling river flow, or at other prohibited places in a river, creek or the watercourse (Article 14). Anyone wanting to do those activities for commercial purposes near watercourses must seek permission from the Directorate (Article 13). Breaches of Article 13 and 14 may be penalised with a fine of between 300,000 and 700,000 kyats as well as up to two years imprisonment (Art 26, as amended in 2017).

The 2018 Mines Rules also contain provisions regarding use of land for mineral production at the site of, or within 200 metres of, any irrigation canals, ponds, dams or other land for storage of water. According to Rule 151(b) (3), the mining permit-holder must secure permission from the relevant public authority if this is public land, or the landowner if privately owned.[444] However there appears to be no prohibition per se in Union Law.

For forest land and land on which there are freshwater fisheries or which is otherwise designated under the law, approval is required from the Ministry of Forestry.

Disaster preparedness

In case of an environmental emergency, a natural or man-made disaster, the 2012 Environmental Conservation Law (Art 37) stipulates that individuals or organisations who incur expenses due to the declaration of an environmental emergency are entitled to reclaim these from a national environmental management fund. This Fund has not yet been established. The wording of the law does not make clear whether the right to receive compensation will apply in cases where an environmental disaster occurs but is not formally declared by a government body. Provisions in the 2018 Mines Rules (Rules 176 and 177) also cover disaster prevention.

[443] The Conservation of Water Resources and Rivers Law 8/2006. An Amending Law No 11/2017 was promulgated on 11 July 2017 but it did not change the relevant sections.
[444] Previously 100 metres in the 1996 Mining Rule 70(b) (4)

B. Field Assessment Findings

Field research showed notable environmental impacts from mining activities in all locations visited. Such impacts often had important consequences for access to ecosystem services and the livelihoods of local communities. An overview of key findings is provided below.

Environmental Management Plans

Human Rights Implicated: Right to participation

MCRB was able to review several EMPs which mining companies shared. These were all produced before the adoption of the EIA Procedure in December 2015. The scope of the EMPs varied widely between mines, even between projects of a similar size and permit producing the same mineral. EMPs numbered between 2 and 80 pages for similar-scale projects led by different operators, and covered a range of environmental, labour and social impacts. It is clear that these plans are not produced according to a standardised template or set of issues across the sector, causing difficulties for review and comparison.

While some EMPs reviewed were found to address the full range of impacts covered by the corresponding EIA, others assumed a much narrower focus, e.g. exclusively detailing the company's strategy to support reforestation of the mine area by planting trees and seedlings. It was not clear – but seems unlikely – that such EMPs had been approved by ECD. None of the projects had been issued with an ECC.

The EMPs which addressed and planned for observed or anticipated impacts flagged by the EIA were found to be of a higher quality than those which were developed for mines which had not yet undertaken an EIA. Even so, an EMP can only be as robust as the EIA process and report which precedes it. Where impacts are not identified they cannot be addressed effectively. EMPs which followed a more thorough EIA were found to offer much more information about company plans, systems implemented to address noise and light pollution, impacts on wildlife and biodiversity, and social and labour issues and impacts during all phases of the mine lifecycle.

Based on the sample of EIAs and EMPs reviewed by MCRB, large mines, unsurprisingly, tended to produce better assessments and plans. However, across the range of reports reviewed, there was significant room for improvement. None of them had been publicly disclosed on company websites, now a legal requirement.

Air pollution

Human Rights Implicated: Right to the highest attainable standard of physical and mental health; right to an adequate standard of living

- **Airborne dust from limestone and gold extraction and processing:** Based on community statements, dust was found to pose an issue especially during exploration blasting, limestone excavation, processing, and transportation by road. Unpaved roads were typically not sealed or watered to reduce dust disturbance as a result of overland traffic and transportation. None of the companies visited had processes in place to

measure or monitor dust levels. One cement factory had installed a dust filtering machine to reduce dust emissions. The machine was reportedly cleaned on a monthly basis, which according to community members released a huge amount of dust, which the company did not take any further steps to dispose of.

- **Dust from limestone quarries and cement factories decreases crop yield and quality:** In communities located near cement factories farmers reported that their fields were covered by dust which had caused the productivity of the paddy to decrease for several consecutive harvests. Due to the lower quality, farmers were receiving a lower price for their crops at market. Based on community measurements and perceptions of crop yield, rice paddy and pumpkin harvests were less bountiful, while eggplant seeds could no longer germinate the following season. At several sites, farmers responded by increasing the use of fertilizer to compensate for lower yields and by using more water to irrigate their fields. Such increased use may also pose an adverse impact on health if crops are not properly washed prior to consumption.
- **Fumes and noxious smells cause concern for communities living near mine sites:** Odourless fumes as well as strong-smelling emissions from cement manufacturing and noxious smells related to blasting in limestone quarries were cited as causing concern or a nuisance to communities living near sites. Residents of several villages near a large-scale gold site reported experiencing bad smells all year around, but particularly on cloudy days. Here, smells from mine emissions were reported to occasionally be so bad that children would be unable to sleep. Residents also told of two cases in 2016 of smoke blowing onto paddy fields, drying out the paddy land and colouring the fields red. Two farmers, who reported that they thought the smoke was toxic, were compensated by the company operating the gold refinery emitting the red smoke and dust.

Water and waste management

Human Rights Implicated: Right to safe drinking water and sanitation; right to an adequate standard of living; right to the highest attainable standard of physical and mental health

- **Chemical waste and industrial effluents contaminate rivers and groundwater:** Gold operations of all scales were found to have contaminated water sources, including groundwater, community wells, rivers, creeks and ponds. Creeks and rivers were found to be polluted by mercury and cyanide from gold operations, as well as untreated acid run-off in tin mining areas, where lead deposits exposed by mining activities were thought to have contaminated community water sources. Both formal as well as informal mining operations were found to be a source of such water pollution. In subsistence mining areas, villagers and/or miners reported that pits were dug reaching the aquifer, allowing ground water to flow into the mine pit. As mercury and sometimes other chemicals are used in the pit and washed out with mine run-off, the tailings were thought to have polluted the groundwater. Cyanide and arsenic was found in several community wells tested by public authorities, in several cases in concentrations vastly exceeding the maximum amounts allowed in the National Environmental Quality (Emissions) Standards.[445] According to affected communities, none of the mining

[445] Due to a lack of data, MCRB was not able to independently verify whether high levels of arsenic were a direct result of company activity or partly or entirely caused by high natural concentrations in the area's soil.

companies identified as being responsible for the contamination followed up to remediate the impact within specified timelines. In the case of one company, there was no follow up at all. At one large-scale mine site, cyanide wastewater resulting from processing was running off onto paddy land, causing suspected cyanide poisoning of cattle. The farmers directly impacted by the pollution complained to the company, which threatened to destroy the villages in which they lived. In some cases, where drinking water was found by government authorities to have been contaminated by company operations and contain cyanide or arsenic, alternative water sources were not provided.

- **Mining operations are too close to waterways:** MCRB field research found both permitted and informal mining activities operating in and near waterways, basins and rivers For example, field research identified extensive river-based mining in some of the subsistence and small-scale gold mining areas. There appears to be no absolute prohibition in either the 1996 or 2018 Mines Rules. However in Sagaing Region, the pre-2016 regional government had stipulated that all mining projects should be carried out at least 1000 feet from river banks and creeks and 800 feet from paddy land[446]. However, MCRB research identified widespread non-compliance with these provisions in three townships. Examples were also observed in some regions where local authorities had issued permits to mine creek areas in contravention of the 1996 Myanmar Mines Rules. In other areas there were examples of regional notifications banning river-based mining. Mining in waterways existed outside the scope of regulation and was seen to lead to unsustainable water-based mining practices. In one example, dredging and the use of mercury and cyanide in two large ponds covering an alluvial gold deposit had led to water pollution and the complete depletion of the ponds' fish stocks. ME-2 representatives reported being powerless to curb gold extraction from ponds because, as opposed to rivers and creeks, there is no regulation against mining from ponds.
- **Sediment discharged from tin mining activities causes siltation of waterways:** According to community testimonies, waterways had narrowed and creeks had been redirected by siltation in several locations. In addition, in several regions with river-based mining of alluvial gold deposits, water blasting was reported to repeatedly stir up sediment from the riverbed, making water inhospitable to aquatic life. Community members remarked that the creeks had become 'dirty'. In several locations, villagers reported previously being able to catch fish in streams but due to mine waste and siltation, fish stocks had been depleted. In one case, this had happened within one year of a large-scale tin mine starting to operate. One community located near a large-scale gold mine also reported that the flow of a creek used for paddy field irrigation, fishing and a source of drinking water for livestock had been redirected due to company operations. While this did not decrease the availability of water in the area, community members found the sudden changes to the natural features in the landscape distressing. The company was subsequently able to redress this issue and remediate the impact to some extent.
- **Inadequate waste management:** In several areas, waste management was found to be an issue. Especially in areas which had experienced a large influx of migrant mine workers, sanitation problems were observed. In local communities surrounding mine sites and in worker accommodation provided by mining companies, many people did not have access to rubbish disposal systems, leading to ineffective waste management.

[446] MCRB interview with Sagaing government officials, 2016

Some communities reported that they suspected inadequate waste management practices to have contaminated their drinking water, but without testing of water sources they could not be sure whether and to what extent this was true. Some communities turned to bottled water as an alternative to community wells previously used; for less well-off communities this was not an option and people continued to drink water thought to be contaminated. Instances where a build-up of solid wastes led to an obstruction of natural water courses by siltation was observed at many sites. During monsoon season, the narrowing of waterways may increase the risk and severity of flooding.

- **Water stress, particularly pronounced in the dry season, is exacerbated by mining:** Field research indicated that both tin and gold mining companies frequently relied on the same water sources for mineral extraction and processing that communities used for drinking water, sanitation and irrigation. This practice reportedly amplified water-related conflict during the dry season; between companies, communities and subsistence miners. In relation to both gold and tin mining, inadequate water supply was found to be a long-term issue facing communities, sometimes for many years. In one tin mining area, for example, the surrounding communities had previously relied on creek water for irrigation and to rear livestock. However, mining activity in the creek meant that it could no longer be used as a water source and so local farmers instead began to rely on mountain stream water. However, as a larger mining company was also relying on the stream water for its operations, its supply had to be shared and this was one factor contributing to the cumulative impact of water shortages in the dry season. Many companies were found to supply drinking water to communities, which may indicate an awareness of the potential for water scarcity. Where companies supplied drinking water to communities, reports where uniformly that communities still did not have access to enough drinking water and water for sanitation.
- **Non-compliance with regulation to disclose public water use and pay water tax:** Several large-scale operations were found to not disclose their source of water for operations to the local authorities for permissions, presumably to avoid being taxed on their water consumption. This constitutes a breach of the 2015 amended Myanmar Mines Law requirement to inform the relevant public authority of water source and usage, and complicates the ability of government authorities to monitor and govern water usage.

Land degradation

Human Rights Implicated: Right to an adequate standard of living; right to the highest attainable standard of physical and mental health

- **Soil erosion and pollution is widespread causing significant damage to farmland:** At several sites visited there were examples of damage to farmland as a result of mining activities. At one site, a farmer had leased a part of his plantation land to a small informal mining operation and attempted to regrow lemons on the land after the small mine closed. However, he reported that the soil was left eroded and that he was now unable to make anything grow. Cumulative impacts were also observed with communities reporting an exacerbation of landslide risk due to piles of waste rock and soil, as well as many open-cut or shaft mines being clustered close together in subsistence mining areas. Such factors were reportedly exacerbated by heavy rains during the monsoon season as well as the regular occurrence of earthquakes and tremors.

- **Topsoil management:** Impacts to topsoil may include compaction, loss of soil structure, nutrient degradation and soil salinity, all of which will make the soil less fertile. Removal of topsoil was found at several sites to have created soil, crop and land damage as well as ponds where soil was removed and dumped on top of farmland, making it unfit for crop cultivation in the future. Only one of the large-scale gold mining companies was seen by the field research team to be watering and managing topsoil, but the effectiveness of this initiative was unknown. According to the township-level forestry department in one gold mining area, while mining companies should rehabilitate land and replant trees, most companies did not follow instructions.
- **Short length of mining lease leads to unsustainable exploration practices:** In one region, small-scale gold mining permits were found to be issued for 20 acres of land with a one-year validity. Here, permitted small-scale miners reported that this was a larger area than they could effectively exploit within the time of the permit. The short duration of permits and the relatively large plots granted to small-scale companies has, according to such companies, led to exploration on the entire plot causing damage to the soil covering the entire concession. According to small-scale gold mining companies operating in some regions, a lack of exploration data makes it hard for small companies to extract minerals effectively, leading them to adversely impact on larger areas than if they could obtain prior data on the size, shape and location of deposits.

Noise and vibration

Human Rights Implicated: Right to the highest attainable standard of physical and mental health

- **Noise and vibration as a result of blasting and use of machinery:** At nearly all small-scale mine sites visited, MCRB field researchers either witnessed or suspected use of heavy machinery exceeding the legal specifications. In addition to the noise created by digging, blasting and crushing operations, communities cited noise from increased road traffic and the loading and unloading of vehicles as having adverse impacts. At several sites, community members reported that they were either not notified in advance of surface or underground blasting, or that a schedule for blasting had been published by the company but not adhered to. Villagers also reported concerns that their houses might collapse due to mine site blasting.

Degradation and depletion of forest resources

Human Rights Implicated: Right to an adequate standard of living

- **Forest clearance for mining activities contributes to loss of forest cover:** At several sites visited, deforestation was reportedly caused by forest clearing for mine and processing sites, as well as unsustainable and often illegal logging of wood for project use. One mining company estimated that 70% of the forest cover had been lost in the area in which the company operated. In another area, extensive logging to fuel mineral processing operations and related forest degradation was found to have limited community access to traditional medicinal plants. Logging for mine shaft construction was reported by communities to contribute to deforestation in heavily mined areas. In addition, the burning of limestone for gold processing or cement production was found

to consume huge amounts of forest timber, often felled illegally. Charcoal for energy production was frequently purchased by unlicensed sellers and also by large-scale mines found to be operating in accordance with other regulations. Communities expressed concern with logging for fuel and charcoal and noted that forest was being felled at an increased rate. In many of the communities visited by the MCRB field research teams, forest provided ecosystem services and benefits such as fuel for cooking, hunting grounds, medicinal plants and inputs to products consumed and sold, such as cigars. Community members interviewed noted that several types of ecosystem services, including availability and accessibility of fuel sources and medicinal plants, had either decreased or been depleted.

- **Lime powder production for gold processing contributes to deforestation by requiring large amounts of firewood:** In one area, a business supplying lime used for processing by a large-scale gold mine had operated illegally since 1991. Owned and managed by a former MoM employee, the business had been granted permission for integrated limestone quarrying and firewood logging by the district GAD with the permission of the township Forestry Department. Operating five large kilns, the owner was reported to be extracting 200 tonnes of limestone and felling 500 tonnes of wood per year. The business owner said he paid 'permitting costs' to GAD. MCRB was unable to ascertain specific amounts. The owner was reported to have a close relationship with a senior Mining Department official who occasionally reaches out to the owner to see whether he is still operating his project without standard permits and helps him to ensure that the operations can continue. The business owner said finding enough firewood to fuel ovens was increasingly becoming a challenge and within a couple of years, he expected to be unable to continue his business due to deforestation in area.
- **Recent large-scale industrial miners also have a large footprint in terms of forest clearance:** According to interviewees, impacts on forest used to be less pronounced, despite widespread artisanal extraction, with much larger impacts being caused as a result of larger scale operations. Community and civil society groups reported military-affiliated companies as having a worse environmental impact. According to MCRB interviews, these companies only employ retired military personnel who have very limited knowledge of environmental management, exacerbating the adverse environmental impacts of their operations.
- **Forestry Law violations occur unchecked due to lack of oversight by the Forestry Department:** Mine permits were observed to be granted for forest land on which mining is prohibited. One example was an area of dense or old forest, for which tree cover was deliberately reported inaccurately by the Forestry Department to leave the plot off Forestry Department lists for protection. Elsewhere, large trees in a mine site area were damaged by mining operations but the Forestry Department did not fine the permit-holder, reportedly due to corruption. In another region, villagers reported that they bribed township-level Forestry Department officials to be able to continue illegal mining activities. In a tin mining area, the Forestry Department told the MCRB field research team that they did not have any knowledge about the level of deforestation because the land on which mining occurs is under the jurisdiction of the Mines Departments. The effectiveness of Forestry Department efforts to support companies in rehabilitating land is also uncertain. Several companies reported having received free seeds and plants from the township-level Forestry Department near mines to encourage replanting in cleared areas. Some companies reported that they were authorised to fell the trees

planted and use them as a source of wood at their own discretion. In some cases it was indicated that the seeds were provided at no cost to the company as a matter of policy, whereas in others companies reported that they were receiving seeds for free due to having a special relationship with the township-level forestry department.

Site rehabilitation and mine closure

Human Rights Implicated: Right to an adequate standard of living; right to property

- **No site rehabilitation and mine closure plans or practices in place by companies:** None of the mine sites visited had rehabilitation plans in place for mine closure. The field research also did not find any examples of systematic rehabilitation of the land on concessions that was no longer being used for mining activities. This included rehabilitation of areas that had been stripped of topsoil. At one site, extensive land areas had been stripped of topsoil for mining activities. According to the Land Record Department, the area is owned by the company but local people were not aware of this.
- **Unclear plans for reclamation of community land after mining activities:** Field research found no structured planning or practices regarding reclamation of land by communities after mining activities. For example, at one site villagers had been informed by a local politician that if the land that had been granted to the company was not used within the first five years of it being granted then villagers would be entitled to reclaim it. Subsequently, when villagers went onto their old land to cut down some trees they were charged with trespassing.
- **No site rehabilitation in subsistence mining areas:** The absence of site rehabilitation practices in subsistence mining areas presents a particular problem. While post-closure mine site rehabilitation is a legal requirement for companies, in the informal sector there is no such equivalent resulting in loss of soil productivity, biodiversity loss, deforestation, soil erosion, the creation of moonscapes and persistent pollution.

C. International Standards, Guidance & Initiatives

Box 27: International Standards, Guidance & Initiatives on Environment and Ecosystem Services and Mining

International Standards:

- ICMM Sustainable Development Framework
- IFC Performance Standards and Guidance Notes:
  - PS 3 – Resource Efficiency and Pollution Prevention
  - PS 6 – Biodiversity Conservation and Sustainable Management of Living Natural Resources
- Minamata Convention on Mercury
- UN Guiding Principles on Business and Human Rights
- UN International Bill of Human Rights and Core Human Rights Instruments
- World Bank:
  - General Environmental, Health and Safety Guidelines
  - Environmental Health and Safety Guidelines for Mining

Guidance:

- BirdLife/FFI/IUCN/WW, 2014, Joint Briefing Paper on Extraction and Biodiversity in Limestone Areas', Cambridge, UK
- Elaw.org Mining EIA Review Checklist
- ICMM, Health and Safety Critical Control Management: Good Practice Guidance and Critical Control Management Implementation Guide
- ICMM, Health Impact Assessment: Summary of the Good Practice Guidance
- ICMM, Metals Environment Risk Assessment Guidance (MERAG)
- ICMM, Mining and Protected Areas Position Statement
- ICMM, Planning for Integrated Mine Closure: Toolkit
- ICMM, Statement on Climate Change and Principles for Climate Change Policy Design
- ICMM, Water Stewardship Framework
- Myanmar Centre for Responsible Business Briefing Paper on Biodiversity, Business and Human Rights in Myanmar, 2018 and separate Mining annex
- Mining Association of Canada, Tailings Management Assessment Protocol
- UNEP and ICME, International Cyanide Management Code
- UN Global Compact, CEO Water Mandate
- UNECE, Safety Guidelines and Good Practices for Tailings Management Facilities
- UNEP, A Practical Guide: Reducing Mercury Use in Artisanal and Small-scale Gold Mining
- WRI, Ecosystem Services Review for Impact Assessment

International Initiatives:

- Alliance for Responsible Mining Certification Process for ASM Practices. This initiative seeks to raise the standards of ASM practices by reducing links to conflict, lowering environmental impact, and improving rates of OSH though certification and technical assistance.
- ICMM, IPIECA and Equator Principles, Cross-Sector Biodiversity Initiative. This initiative is aimed at developing and sharing good practices related to biodiversity and ecosystem services in the extractive industries. The initiative supports the broader goals of innovative and transparent application of the mitigation hierarchy in relation to biodiversity and ecosystem services. The programme of work is divided into two main workstreams: tools and guidance; and knowledge sharing.
- UNEP, Global Mercury Partnership. The overall goal of this Partnership is to protect human health and the global environment from the release of mercury and its compounds. The Partnership works closely with stakeholders to assist in the timely ratification and implementation of the Minamata Convention on Mercury.