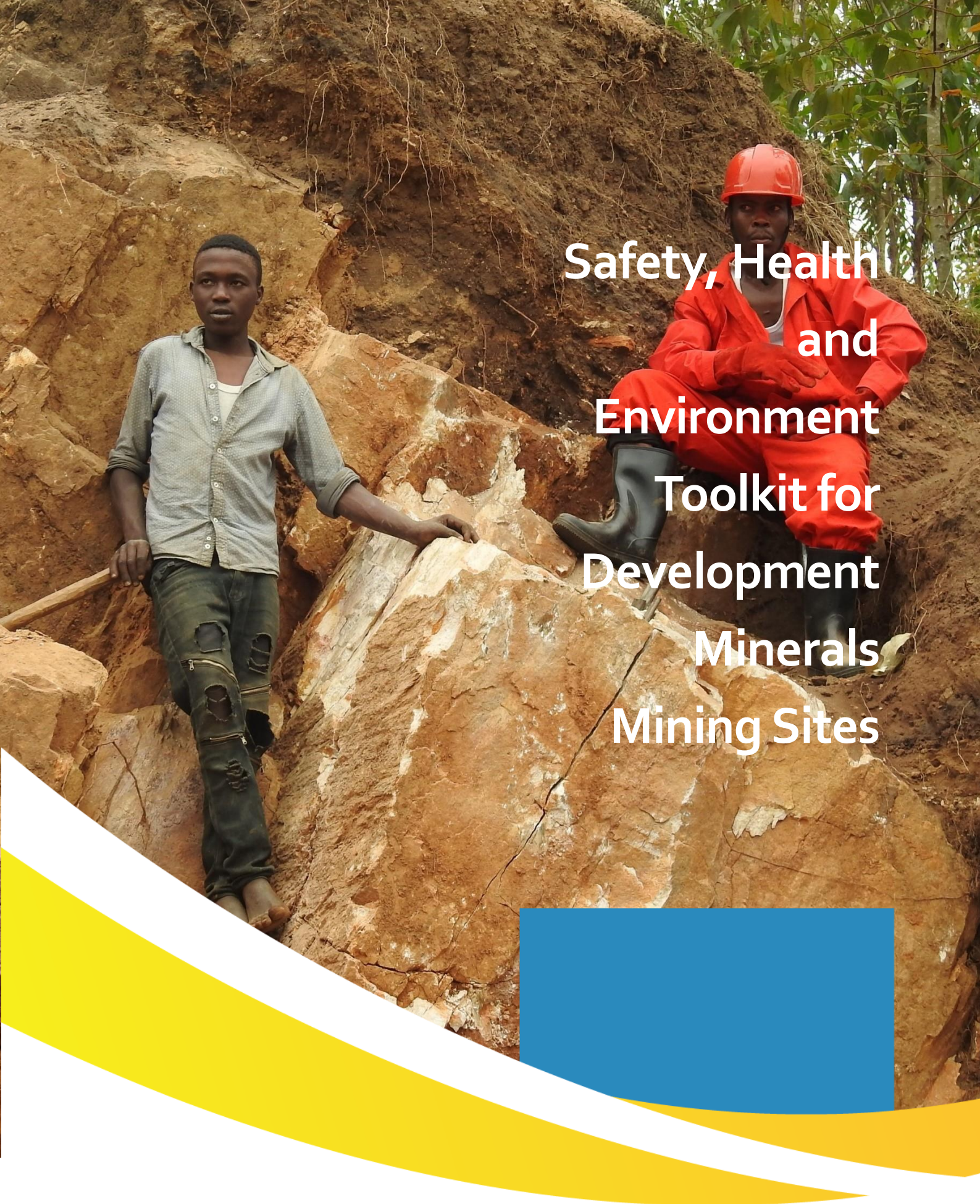

Safety, Health and Environment Toolkit for Development Minerals Mining Sites

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About the ACP-EU Development Minerals Programme: The ACP-EU Development Minerals Programme is an initiative of African, Caribbean Pacific (ACP) Group of States, coordinated by the ACP Secretariat, financed by the European Commission and United Nations Development Programme (UNDP) and implemented by UNDP. This €13.1 million capacity building program aims to build the profile and improve the management of Development Minerals in Africa, the Caribbean and the Pacific. The sector includes the mining of industrial minerals, construction materials, dimension stones and semi-precious stones.

Cover photo: A youthful artisanal miner poses with a fully dressed colleague at Buramba stone quarry in Bushenyi District. The Personal Protective Equipment was purchased for the miners by the Bushenyi District Natural Resources Office with funds from a UNDP ACP-EU small grant to Bushenyi District Local Government in 2018.

Safety Begins with You!

Introduction to the Toolkit

This toolkit has been produced to provide information and useful tips to guide Artisanal and Small scale Miners (ASMs) in the Development Minerals sector to observe SHE standards and ensure safe and healthy working conditions at mine sites.

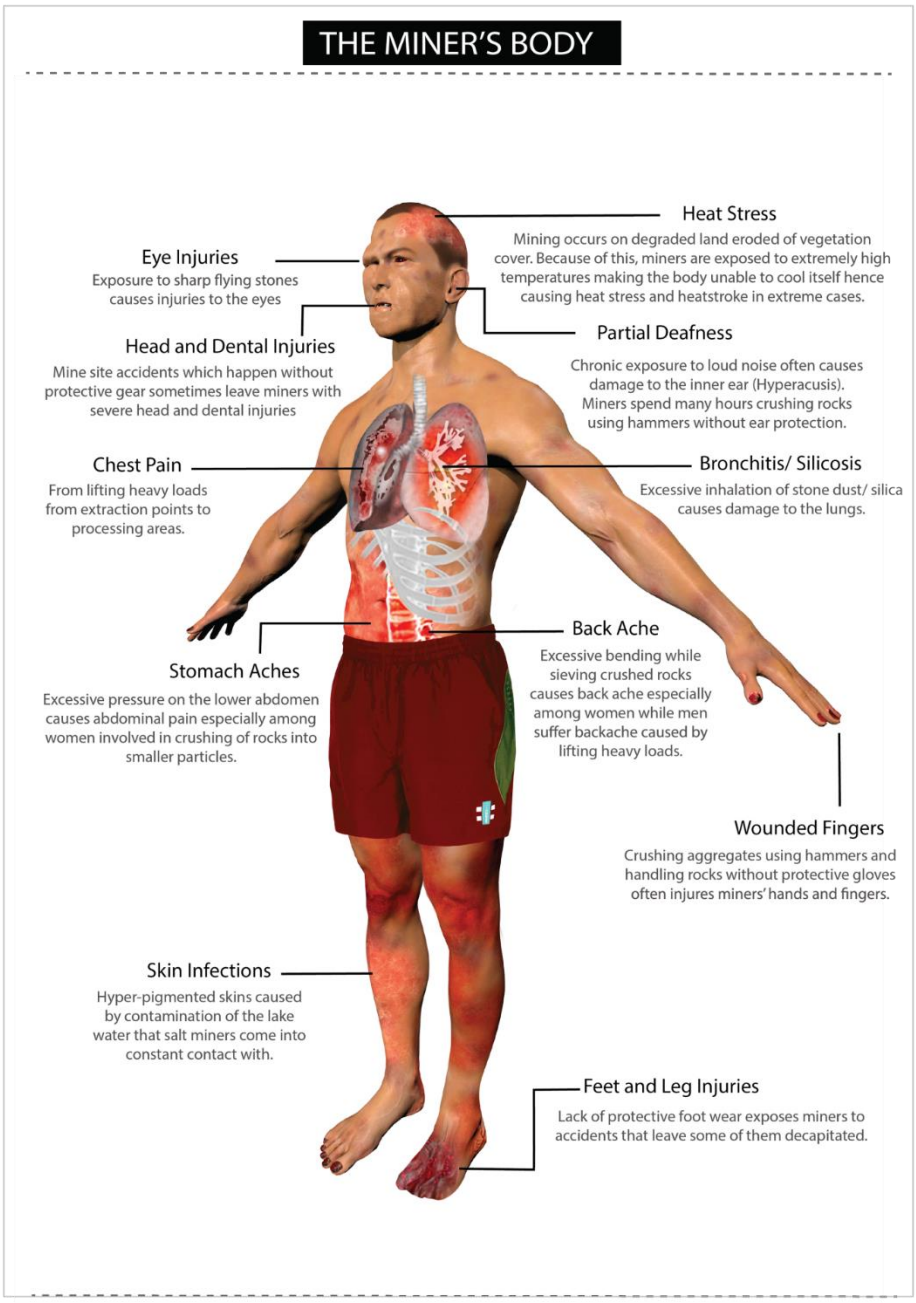
The toolkit is intended to guide ASMs in the Development Minerals sector to mitigate or even eliminate accidents and common health issues arising out of their day to day work.

It starts by illustrating common accidents and ailments by miners of Development Minerals and goes ahead to provide a text and graphic guide on how these can be overcome indicating the do's and don'ts

This toolkit has been tailored specifically for Development Mineral Mining sites based on prevailing SHE conditions at ASM sites. Use of this toolkit however does not in any way guarantee that ASMs will not be exposed to risks and hazards in their daily operations. This toolkit also is not meant to replace conventional methods of administering medical treatment or first aid in the event of an accident at an ASM site.

1. The Miner's Body

Artisanal and Small scale Miners (ASM) in the Development Minerals sector are faced with a multitude of Safety Health and Environment issues that expose them to accidents, hazards, risks and health problems. Some of these are mineral specific while others apply generally to Development Minerals. The illustration below depicts the different ailments and body defects that a person involved in the artisanal extraction of Development Minerals is likely to face in the course of their work.



2. Common Accidents at ASM sites

The table below lists common accidents at Development Minerals ASM sites grouped according to mineral commodities:

Mineral Commodity	Activity	Common Accidents	Associated potential illness
Stone Aggregates	Blasting, heating and Excavation	Body injuries from flying rocks, burns from misfires, premature blasts and collapsing walls	Wound infections, Physical disabilities
	Drilling, breaking and crushing	Hand and wrist injuries and eye injuries from splinters	Physical disabilities, eye infections and blindness
	Hauling and loading	Falls, Back sprains, head injuries and cuts on hands	Physical disabilities, immobility and wound infections
	Sieving	Eye injuries from dust particles	Eye infections, loss of sight, wound infections.
Sand	Scooping (in lake)	Feet injuries, drowning	Tinea Pedis (Athletes foot), fungal infections, Immersion Foot Syndromes disease.
	Digging (in swamps & forests)	Feet injuries, snake bites, body injuries from collapsing walls & subsidence[1]	Tinea Pedis (Athletes foot), fungal infections, Immersion Foot Syndromes disease.
	Rowing to Lake shore and loading	Wrist and Back sprains and cuts on hands	Physical disabilities, wound infections
Limestone	Digging	Hand and feet cuts	Wound infections
	Loading and burning in Kiln	Hand cuts and burns from excessive heat	Wound and skin infections
	Packing and loading	Hand Cuts and back sprains	Wound and eye infections
Marble	Wedging	Eye injuries from splinters	Eye infections, blindness
	Heating	Burns	Blisters, infections

[1] The gradual caving in or sinking of an area of land.

	Breaking and crashing	Eye injuries from splinters	Eye infections, blindness and physical disabilities

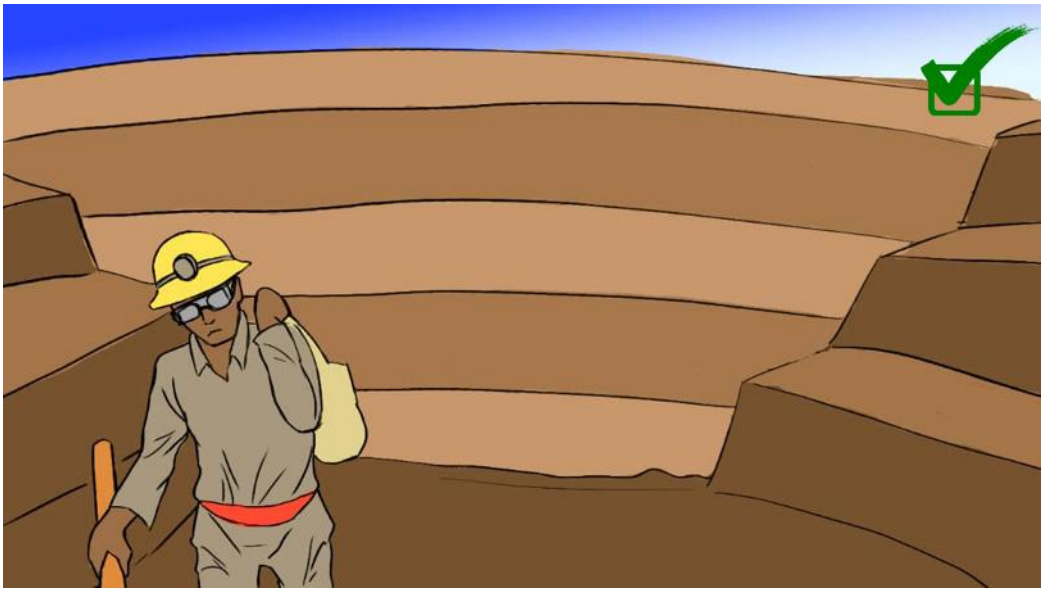
3. Managing Accidents at ASM sites

Overall, accidents can best be avoided by observing personal care and applying safe mining techniques at ASM sites.

Preventing Collapsing Walls

Avoid the risk of walls collapsing by systematically creating benches that help to stabilise the soil at the mine site. The miner in the illustration below is not only exposed to eye and head injuries but also serious body injuries and possibly death if the wall collapses.

Benches are "steps" constructed in the pit wall to keep it stable by forming a spiral to the bottom of the pit. They also help to efficiently transport ore and waste rock. The height and angle of the benches depends on the strength of the rock. The wider the bench, the safer and more practical it will be.



Always be careful about managing overburden (soils or rocks overlying the ore). Overburden is made up of loose soil and or broken down rock and is hence weak and can easily collapse or slide into the pit. Mine site managers should make regular inspections to identify signs of pit wall failure or rock falls. In case of potential danger, keep miners away from that area. Where possible, erect signs warning miners about the imminent danger.

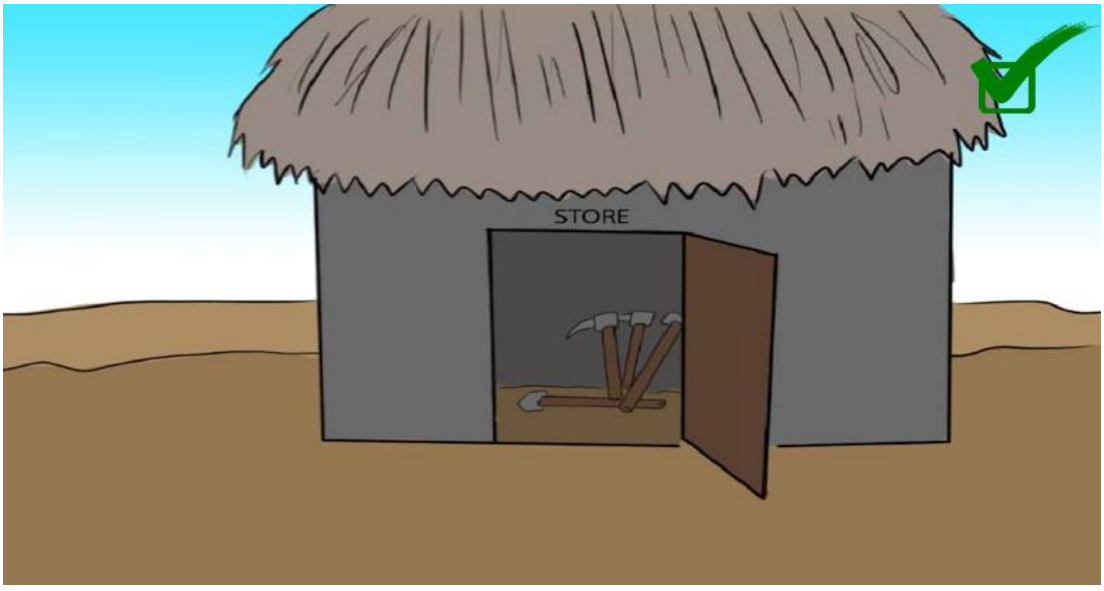
Site Management Safety Tip

Miners should be trained on good mining techniques and only trained workers should be allowed to extract. Extra caution should be taken during the rainy seasons because water increases the risk of wall collapse. Always look out for fractures in pit walls and indications of movement or shift of the wall.

Safely Store Tools and Sharp Objects

Tools carelessly left lying around quite often cause injuries to miners and children around mining sites.

Always keep the tools in one central place to minimise accidents.



Site Management Safety Tip

Every site should have a safe storage room for tools. This also reduces the burden of carrying working tools home which can cause accidents to children.

Ban Substance and Alcohol Abuse at Mine Sites

Working under the influence of alcohol or narcotic substances such as marijuana and other drugs creates risks for you and other miners working around you.

Site Management Tip

Don't Mix it. Alcohol and drugs are strictly prohibited from areas of work. Site owners should put up notices in this regard as a reminder to everyone around the site. Alcohol affects the brain and exposes workers to danger while on site.

Injuries and accidents that are a result of alcohol or drug use can be prevented by;

- Sensitization on the risks associated with alcohol and substance abuse
- Prohibiting alcohol, narcotics and any other intoxicants at the ASM site during working hours.
- Workers showing signs or suspected of being under the influence of narcotics, alcohol and any other intoxicants should be stopped from working for the day and cautioned on the possible effects of their actions and mental state.

4. Personal Protective Equipment

This is the easiest and surest way to protect oneself from risks associated with mining. Generally, a well-dressed miner should have a helmet, nose mask, eye protectors, ear muffs, reflectors, overalls, gloves and gum boots. Miners should avoid going to conduct mining operations when they are not wearing any PPE.

The type of PPE used depends on the nature of work a miner is involved in. The illustration below shows a miner in a full PPE kit.

5. Protection against Excessive Dust

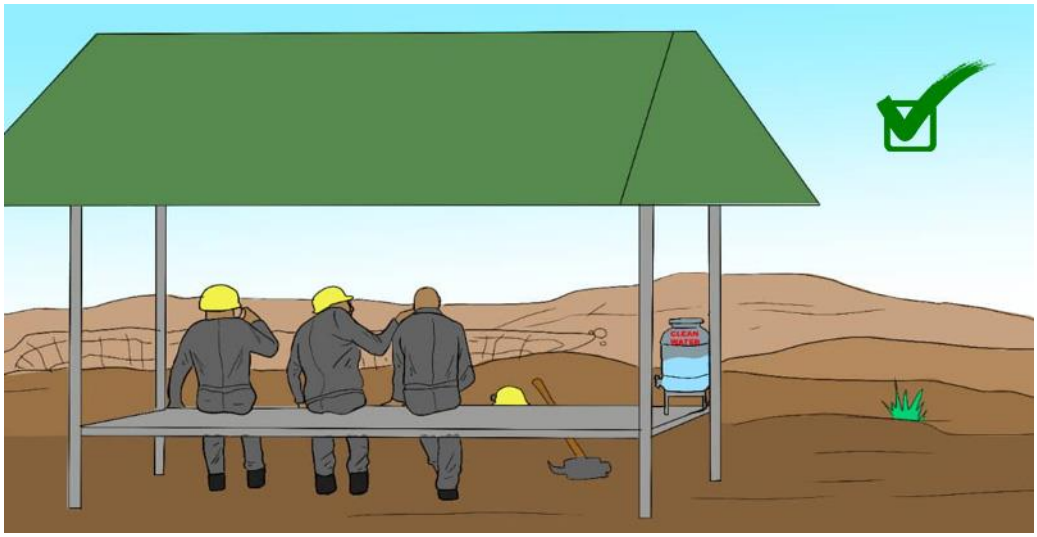
Dust can cause chest pains, asthma, persistent cough, chronic bronchitis, lung fibrosis, silicosis or even lung cancer in the long run. Dust is raised along the production value chain and miners must take caution in preventing excessive inhalation.

Miners, mine site operators and site leaders can not entirely eliminate dust during their operations. However, they can use PPE such as nose masks to protect themselves as illustrated below.

Where possible, water can sprinkled around the working areas to moisten the ground and reduce the release of dust.

6. Mitigation against Heat

Exposure to excessive heat for long hours often leads to dehydration, fatigue and sometimes fainting. Building resting shades can help protect against excessive heat. These can be constructed using tarpaulins or an iron roof. In areas with Savanah grasslands, the shades can be thatched with grass to cut on costs. Miners can also endeavour to protect big leafy trees from being cut down. These provide natural protection from the sun. Safe water should be availed at the resting shade to enable miners rehydrate.



7. Protecting the Environment

Miners quite often tend to cut down trees to extract the minerals beneath the ground. Sometimes, trees are cut down to provide firewood for brick burning and disintegrating rocks. This has led to soil erosion, flooding and heat stress.

Mine site managers can start and maintain a nursery bed where miners can pick trees at no cost for planting around the mine site and replacing trees that are cut down for use during mining works.

Site Management Tip

For every tree cut, two should be planted. Pits should always be backfilled to prevent flooding and accidents. Create an environment that will ensure survival for future generations.

8. *Mitigating Body Stress*

Forceful motion, repetitive actions, awkward postures, direct pressure and extreme temperatures cause injuries to the muscles which can result into long term disabilities if not checked.

Site Management Safety Tip

To control or minimize the occurrence of such hazards or risks, miners should do the following:

- Take scheduled rest breaks.
- Rotate your job with others to avoid repetitive work.
- Put steps and benches in pit walls to make carrying of rocks easier.
- Use a wheelbarrow if you can to haul rock instead of carrying.
- Do physical exercises such as sit ups, push-ups to keep your body physically fit.
- Always keep your back upright and bend your knees while lifting heavy loads to avoid straining your limbs and spinal cord.
- While carrying heavy loads, keep your back upright and carry the load close to your body.
- Avoid crooked or twisted postures while working.
- Keep all the materials and tools you need close to you to avoid stretching out further than necessary.

9. *Observe Good Sanitation*

A mine site must have toilet facilities to minimise the risk of diseases such as diarrhea, dysentery and typhoid. Using nearby bushes as toilets not only exposes the miners at the sites to diseases but also the surrounding population associated with the miners.

Site Management Safety Tip

Site owners should construct pit latrines for men and women in close proximity to mining sites. The facility should have hand washing water. This helps women who quite often during their menstrual periods have to go back home to access toilets and also prevents diseases associated with poor feacal waste disposal.

10. *Maintain Good Hygiene*

Mine site managers have to carefully manage waste rock, tailings (if any) and effluent or waste water. Miners should be guided to dump waste rock into big piles in a good convenient location around the mine site away from the central mining areas.

Garbage lying around the mine site causes pollution and creates a smelly working environment. The waste can be a breeding ground for disease-carrying parasites, pests and insects.

Site Management Safety Tip

Miners should ensure to always dump waste material into a pit from which it can be burned. Plastics and other non-biodegradable material can be recycled as opposed to being thrown away.

11. Keep Children away from the Mine Sites

DO NOT allow children to play near or around mining sites. Parents should ensure young children are kept a reasonable distance away from mining activities attended to by older children to avoid accidents. Not all forms of work done by children are considered child labour. Under ILO standards, light work that does not interfere with education and is not hazardous is permitted from the age of 12. Work by children 15 years and above that is not classified as hazardous is also permitted. However, mining is one of the most dangerous types of work and should not involve children.

12. Administering First Aid

First Aid is the immediate and temporary care given to an injured or ill person at a work site using available equipment, supplies, facilities, or services, including treatment to sustain life, to prevent a condition from becoming worse, or to promote recovery. Miners quite often use locally created first aid means some of which may be unsafe and cause the situation to deteriorate further.

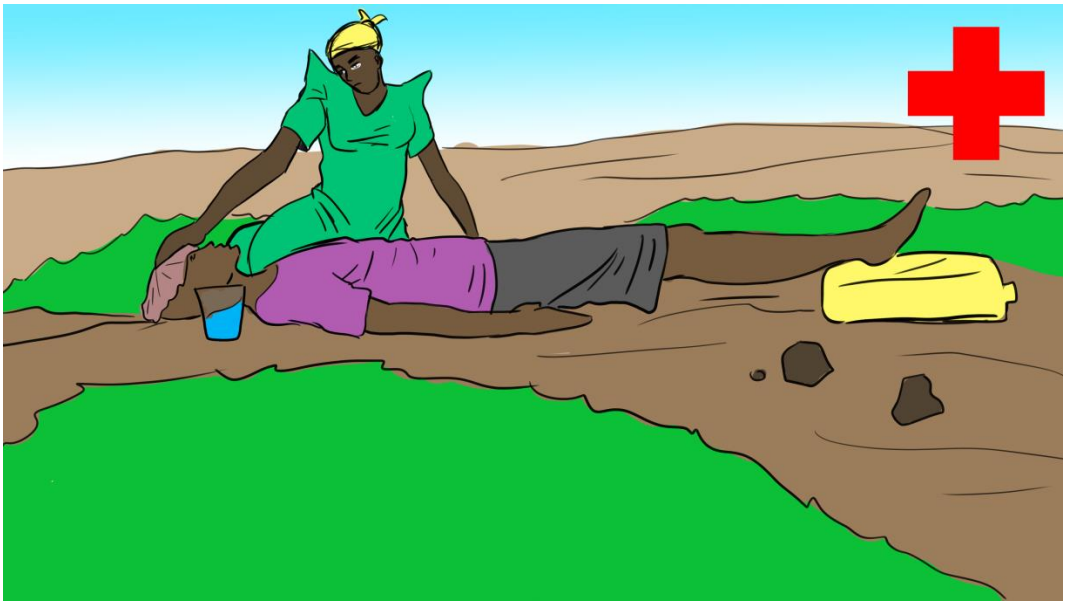
Site Management Safety Tip

Every site should have first aid equipment accessible to a team of first aiders trained for the purpose of offering first aid free of charge to all workers on the site. The first aid box should be replenished as often as possible.

How to Administer First Aid

a) Heat Stress

Make the casualty lie down with legs slightly elevated and use a piece of cloth water to cool down their temperature. When the casualty gets better, ensure that they drink plenty of water as illustrated below.



b) Cuts and Wounds

Exert a lot of pressure on the wounded area with gauze as illustrated below to reduce the bleeding which can make the situation fatal.

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