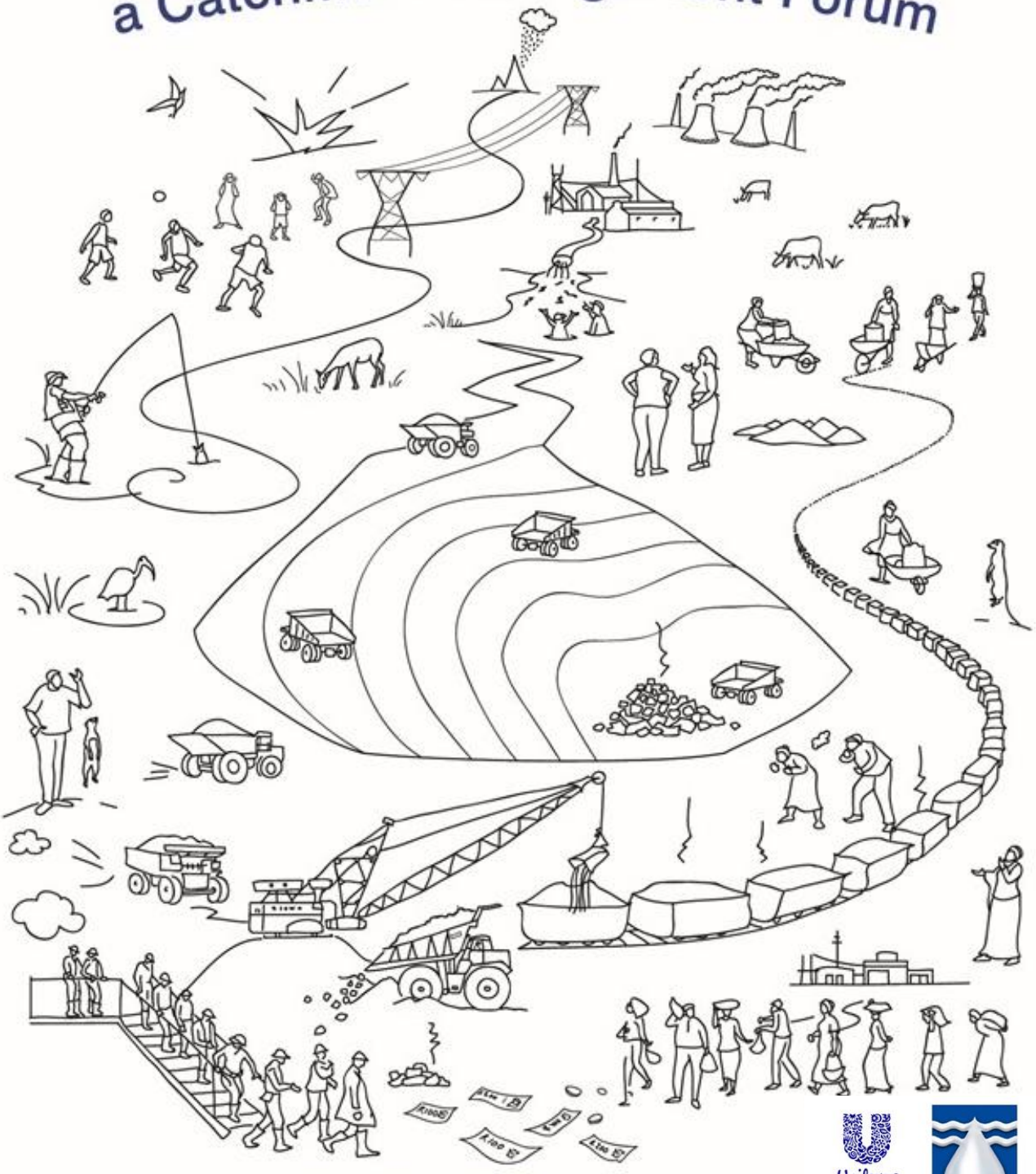
DRAFT

HOW TO...

Engage with coal mines through a Catchment Management Forum



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UCEWQ UNILEVER CENTER FOR WATER QUALITY

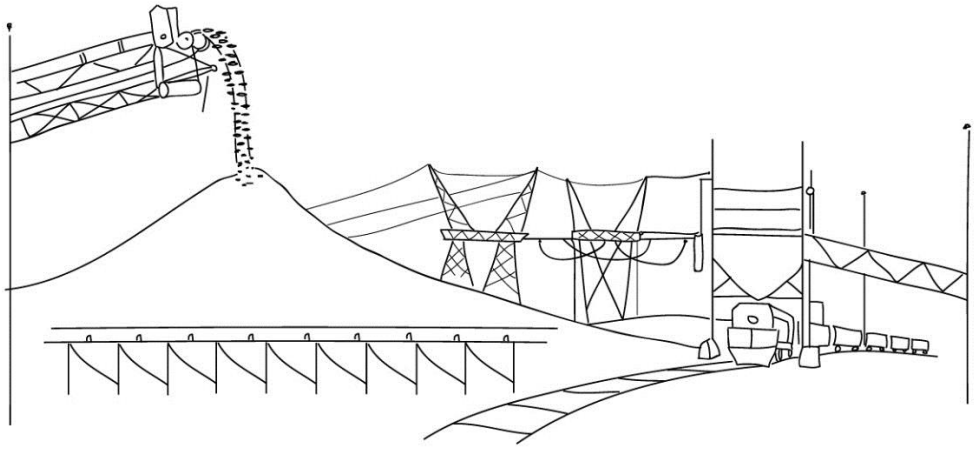
Unilever

WATER RESEARCH COMMISSION

Who is this handbook for?

It's for citizens who want to protect water and biodiversity; for people who are involved in making decisions about coal mining, and people who are concerned about the kinds of decisions being made about coal mining. It's for people who want to know more about the effects of coal mining on the environment and ecological infrastructure*, biodiversity, and on us.

We need coal for electricity, but coal mining damages and destroys our water resources, wetlands and biodiversity*. How can we make good decisions about coal mines and protect our water at the same time?



NOTES:

This book was written for the catchment management forum (CMF) in the Upper Komati Forum (UKF), and they share their experience in order to help other CMFs understand the damage coal mining does to our water resources.

This booklet should be used with *How to Think*… and *How to establish and run a catchment management forum (CMF).*

An * indicates that the word(s) are in the glossary at the end of the handbook.

A true story of a coal mining town

On the morning on 11 January 2012, residents of the small Mpumalanga Highveld town of Carolina woke up to sour water in their taps. The water tasted bad and had a funny colour. Porridge prepared in this water turned blue. A white jelly formed on top when the water was boiled. Residents could not brush their teeth because 'it felt as if your mouth was on fire' (Tempelhoff et al, 2012). It turned out the dam was acidic, with a very low pH*.

The Upper Komati Forum was the first catchment forum to be directly affected by acid mine drainage (AMD)* from coal (there are other forums in the Vaal and Limpopo catchments that are affected by AMD from both coal and gold). In 2012, the town of Carolina had no drinking water for seven months as a result of the acidification* of the town dam. The UKF was formed because of this incident. At the same time, the Inkomati Catchment Agency (now the Inkomati Usuthu Catchment Management Agency, or IUCMA) was established. Its purpose is to look after the water resources of the catchment, of which the Upper Komati is a part. One of its functions is to support catchment management forums.

Because of the AMD crisis of 2012 the Minister of Mineral Resources instructed local coal companies to design a common closure strategy – in other words, to plan how water resources will be protected from coal mining pollution during mining operations, and after the mines have closed.

There are a number of medium to small mines in the Carolina area. Some have been abandoned, some are still active above the wetland. From these mines, and the railway siding where coal is heaped, stored, and moved onto trains, acid mine drainage seeped into the mud in the wetland, and collected there over years. Because the rocks in the area are naturally low alkaline*, they could not neutralise* the acidity of the mine water. This acid build-up was unnoticed for decades, because the Boesmanspruit wetland and town dam were used as a channel to transport water from the Jericho Dam into Eskom Nooitgdag Dam, which stores clean water for Eskom's use. So the acid water was constantly diluted and flushed out. But, in 2012 there was an interruption in this flow.

As a result, the regular stream of clean water for Eskom was no longer diluting the build-up of acidity and heavy metals* from coal mining in the area. Then there was a heavy rainstorm in the upper reaches of the Boesmanspruit catchment (including the Witrandspruit).

After the long, rather dry period, the storm brought 155 mm of rain. The accumulated acid mine water and the heavy metals it contained washed into the town dam, from which the town draws its drinking water. The acid water led to fish deaths, higher levels of sulphates and toxic metals like aluminium, chrome, cobalt, copper, iron, lead and manganese. The town's drinking water purification works failed, because they were not designed for treating acid mine drainage and heavy metals.

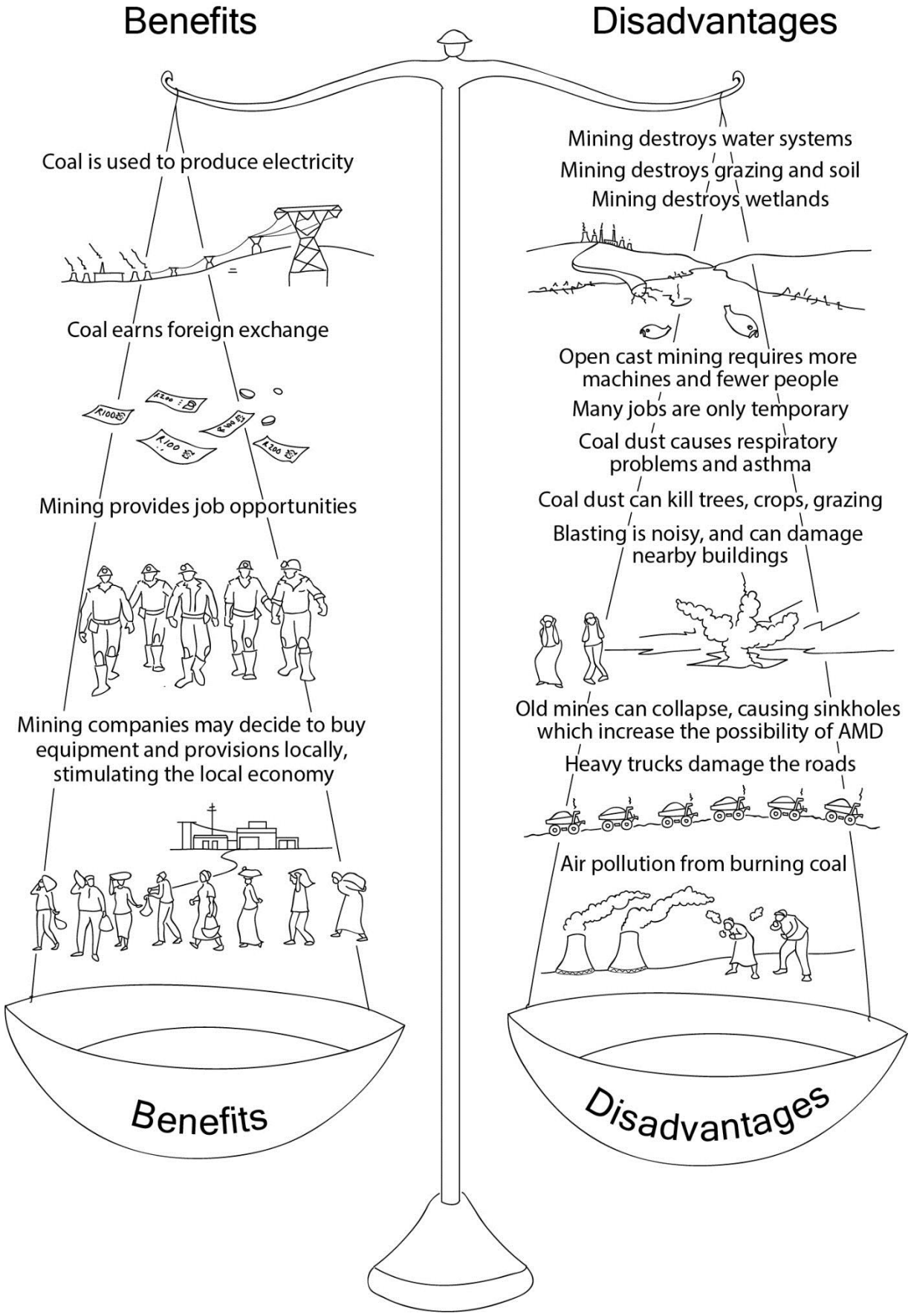
How this handbook was developed

Also in 2012, a mine near Ermelo, which had illegally mined through a river and wetland, agreed in court to rehabilitate* the river. They also agreed to pay money into a WRC research project which would make sure that all damage to the environment or to people (things that that the mines do not usually pay for) would be included in the mine's cost calculations in future.

The research team worked with volunteers in the UKF and developed a 10-point decision-making process. They also developed a decision support system, which is electronic and publicly available, and they developed this handbook.

Why do we need to balance coal mining with protecting our water resources?

Coal mining has many benefits, but also many disadvantages, as these lists show:



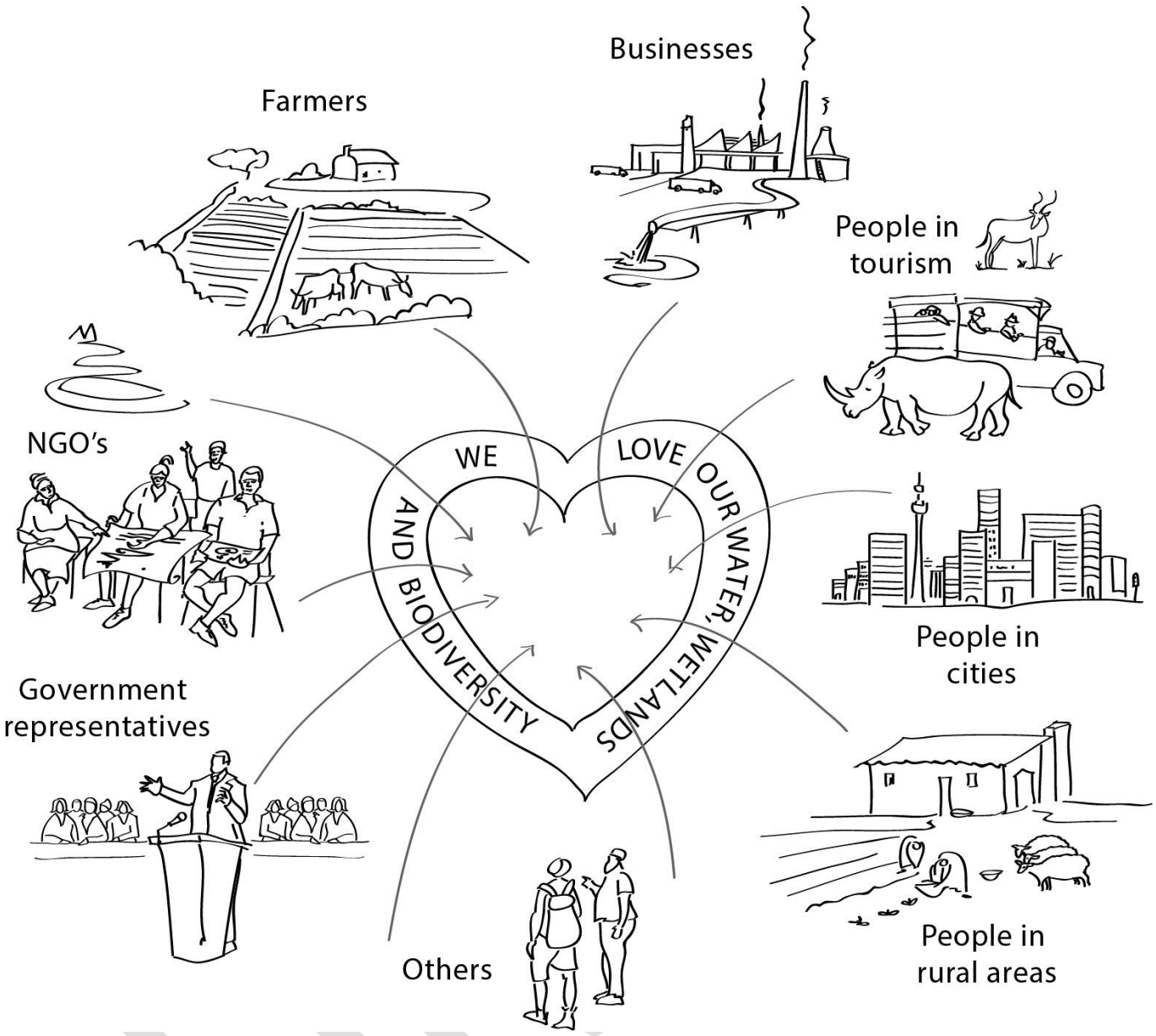
The benefits need to be carefully considered, though. It is true that coal mining can provide job opportunities and local, unskilled labour is often used in the early stages of construction. However, mining companies must explain to the community what the nature of the jobs is and how long they will last. If the

companies do not explain, people's expectations are not met, and the community becomes disappointed and angry. As coal mining becomes more mechanised (uses more machines and fewer people), and if it uses the open-cast method of mining, there are fewer jobs and the people who can do them need to be skilled and experienced. It is therefore important to understand the method of mining in order to judge how many jobs it will produce, and for how long.

Mines must develop Social and Labour Plans with the local and/or district municipality as well as with trade unions in order to benefit the community where the mine is. These plans often take the form of the mining company providing a road, or school buildings, or other investments that can benefit the municipality and the local communities.

Coal mining companies can choose whether they buy equipment and provisions locally or not, and they may also choose whether or not to reveal their expenditure locally, provincially and nationally. Most mines can estimate how much coal they will mine, over how many years. These figures can be used to estimate the income from the mine.

The decision to mine, and the decision about where and how to mine, must be carefully considered, and all stakeholders should be involved in the process. Stakeholders include people already living and working in the area; those that are involved in or dependent on land uses that may be threatened by mining, as well as land uses that might be changed or threatened in the future.



Development must be sustainable, which means "meeting the needs of the present without compromising the ability to meet the needs of future generations", that is, we must use our resources in such a way that there will be resources for our children and their children.

A CMF monitoring the water resources of a catchment should make recommendations to avoid or reduce the damage that coal mining may cause to present and future options for other land uses, such as food security, biodiversity and tourism.

What coal mining does to water resources in the Mpumalanga Grasslands

In the Carolina area, a sandstone* layer a metre or two below the surface keeps water in the soil, enabling plants to grow. Rainwater moves in and along these top two metres, creating springs and wetlands. The coal seams are below the layer of sandstone.

Prospecting holes* can puncture the sandstone layer, and open-cast mining (Figure 2) completely destroys it. No rehabilitation can reconstruct it. Underground mining can cause subsidence*, and cause the sandstone layer to collapse (Figure 4).

Figure 1 shows the relationships between water resources on the surface, water in the soil and the coal below. It also shows the pyrite* (rocks containing iron sulphate*) layer, from which acid mine drainage is released when the rocks are exposed to water and oxygen. The soils and rocks of the Carolina area have a low buffering* capacity, so the area is sensitive to acid mine drainage.

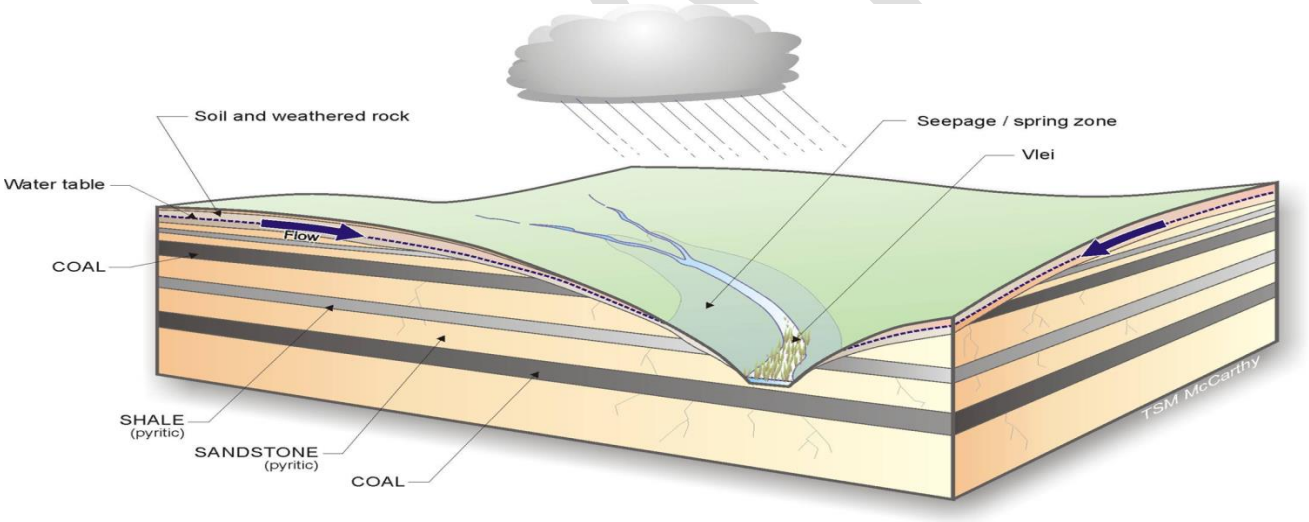


Figure 1. Relationship between surface water sources, soil water and coal seams. (Diagram by Prof T. McCarthy pers comms)

Figure 2 shows how coal is mined using the open-cast method. All the layers of soil, sandstone and shale, including the pyrite which creates acid mine drainage, are removed to expose the coal seams for mining. The 'overburden'* is eventually returned to the mine, if it is rehabilitated (on the right of the diagram). However, because the coal has been removed, there may not be enough rock and soil to fill the hole, leaving a landscape shape that forms a depression where water can accumulate.

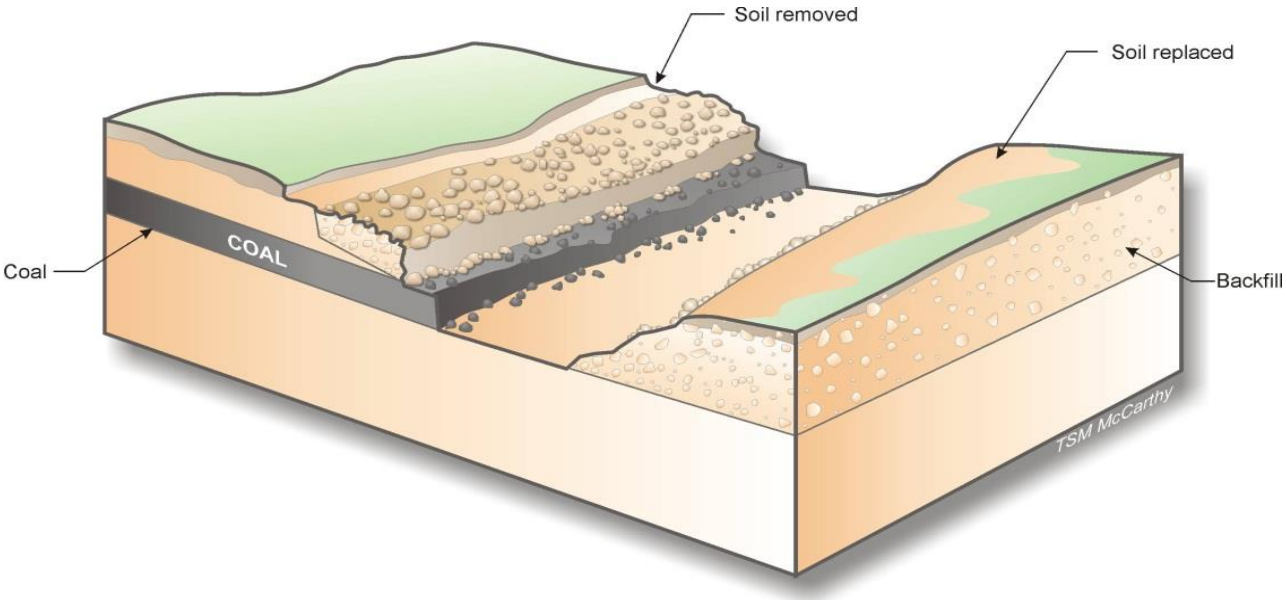


Figure 2. Open-cast mining. (Diagram by Prof T. McCarthy pers comms)

Underground mining uses a method called the pillar and board method (Figure 3). Pillars of coal are left behind in order to hold up the roof which consists of overlying layers of rock and soil.

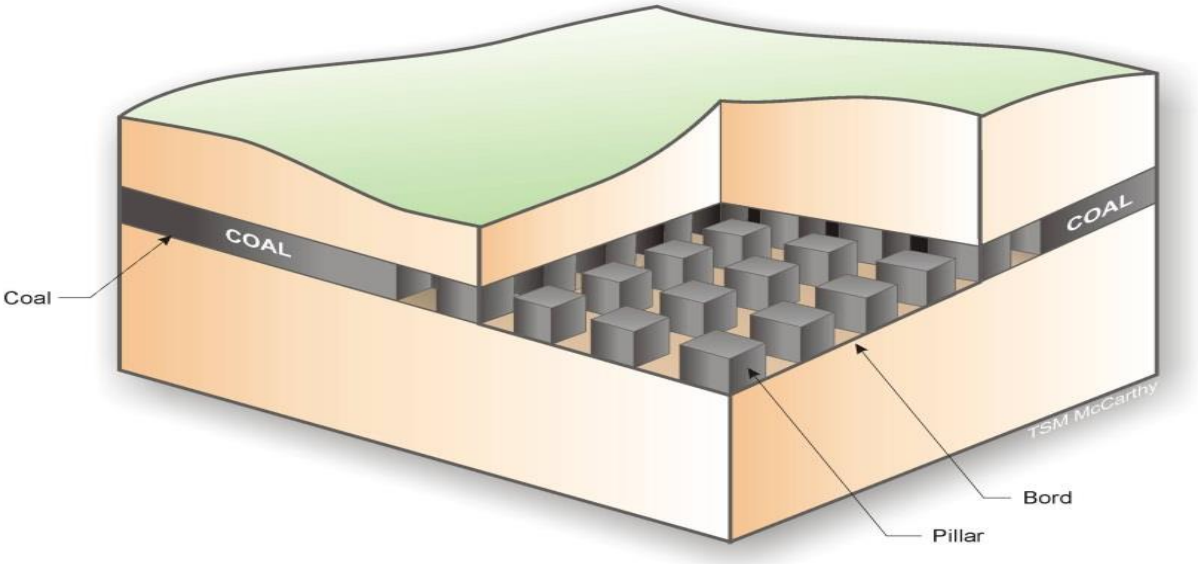


Figure 3. The pillar and board method of underground coal mining. (Diagram by Prof T. McCarthy pers comms)

However, over time, these layers collapse in a typical chequered pattern called ‘subsidence’ (Figure 4). This happened in mines in Middelburg and Witbank/Emalahleni. Subsidence creates hollows on the surface; clean surface water seeps into the old mine and becomes contaminated (that is, poisoned or polluted) in the form of acid mine drainage. The water also picks up heavy metals.

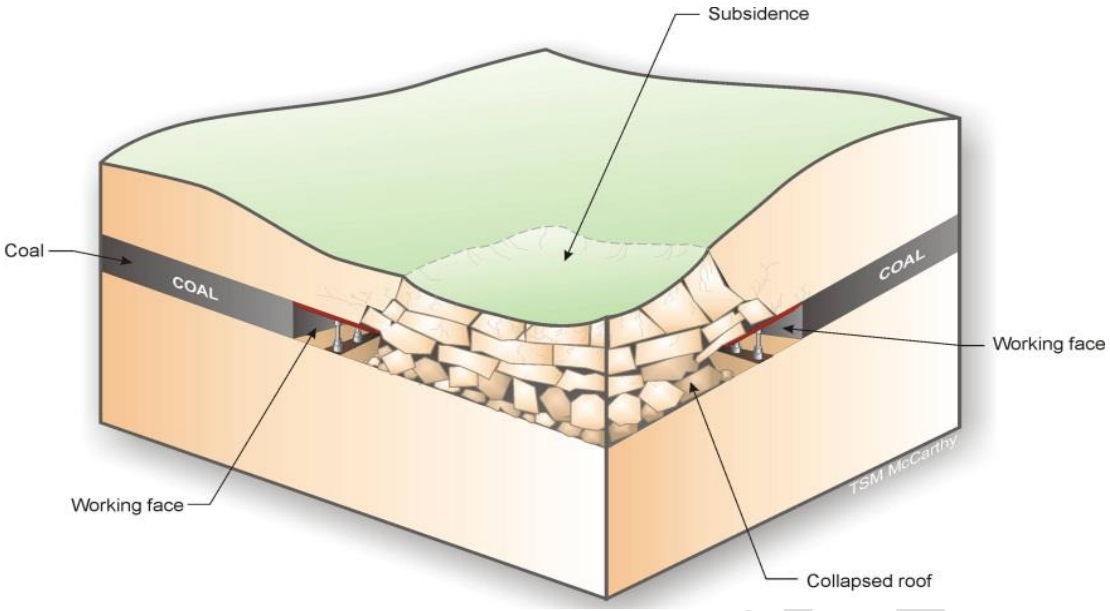


Figure 4: Collapse of rehabilitated pillar and board mine showing subsidence. (Diagram by Prof T. McCarthy pers comms)

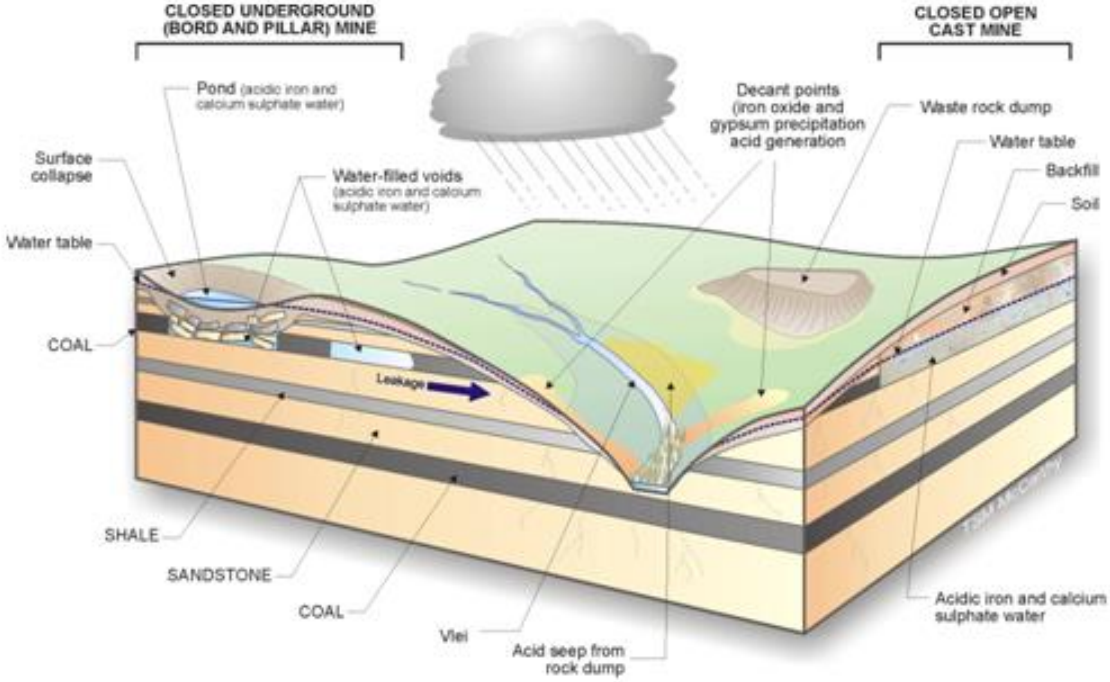
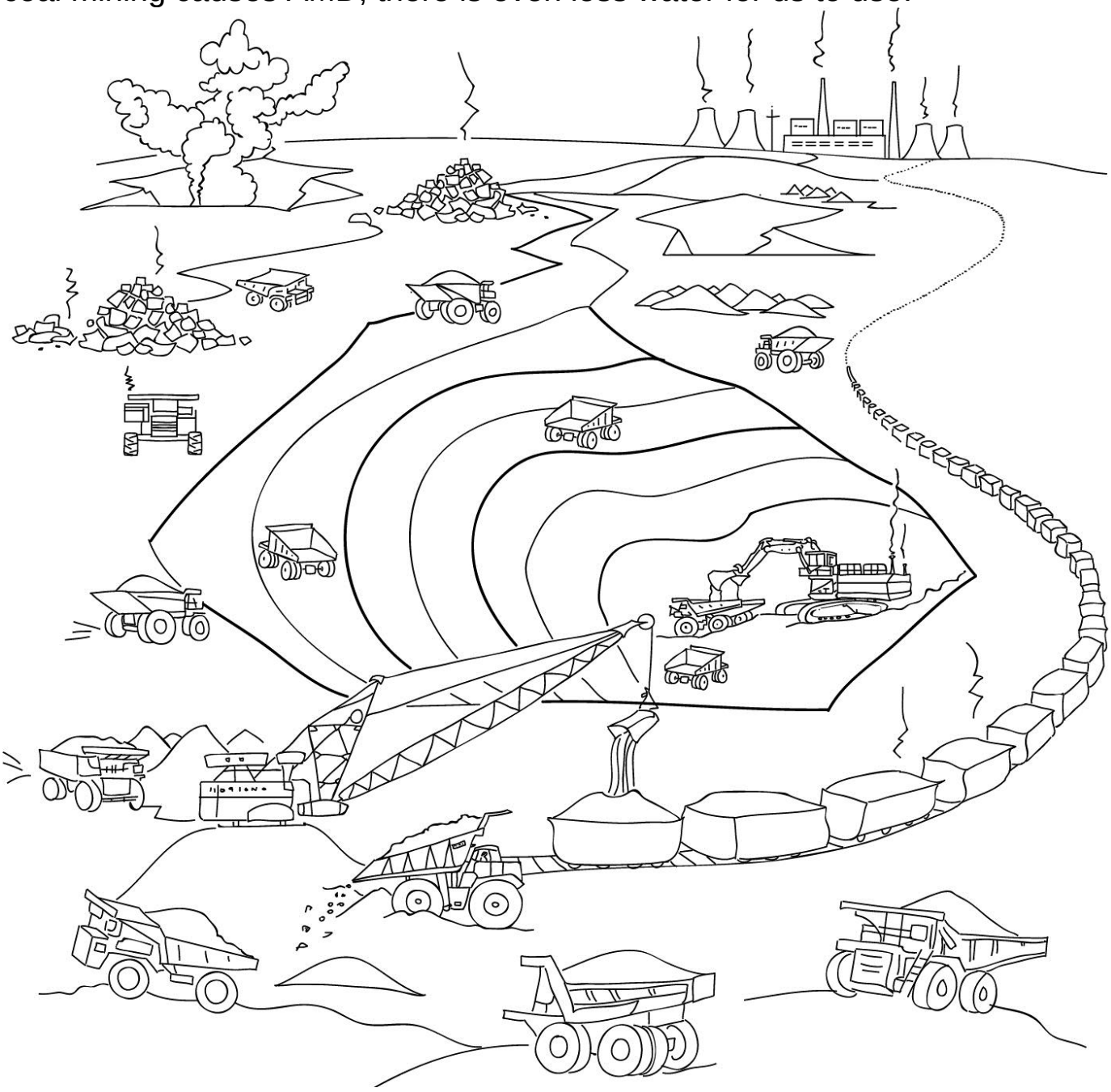


Figure 5. Long-term effects of coal mining. (Diagram by Prof T. McCarthy pers comms)

Figure 5 shows the long-term results of coal mining. The surface of the pillar and board underground mine on the left of the diagram has collapsed, and water is accumulating in it and draining into the mined area. On the right, surface water has also entered the rehabilitated area. From each mined area, a decant point* has developed and is leaking acid mine drainage water into the stream just before the wetland. Contaminated water is also flowing through a rock dump.
The wetland's functioning is severely compromised, possibly leading to total collapse.

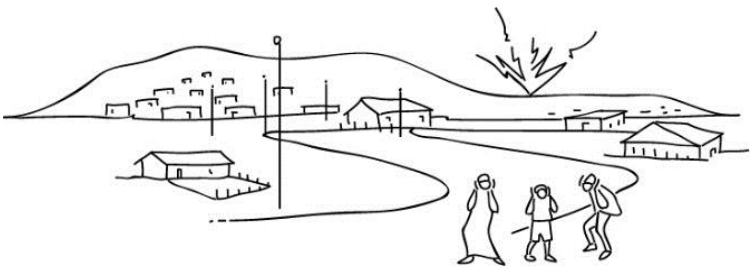
Are there other problems with coal mining?

South Africa has very limited water resources. It is the 30th driest country in the world. Its water resources are fully allocated, so there is none to waste. When coal mining causes AMD, there is even less water for us to use.



Other problems caused by mining include:

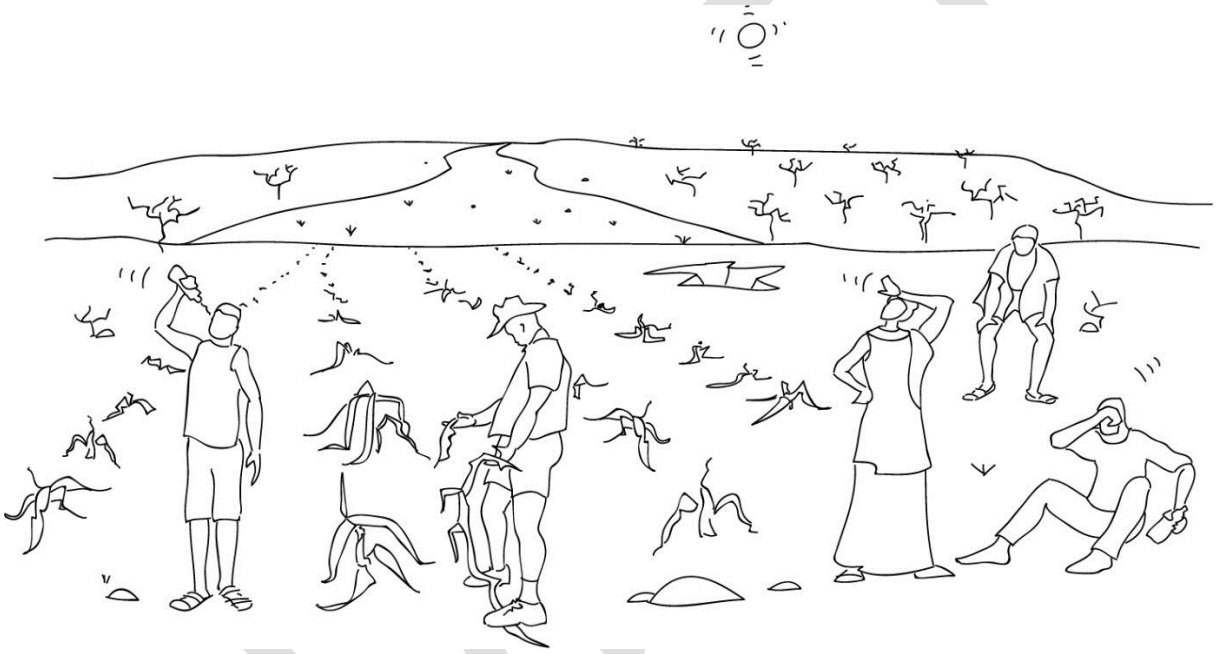
- damage to nearby dwellings from blasting
- disturbing noise from blasting
- dust from mine operations
- heavy trucks on roads not built for them
- air pollution



- dumps of discarded rock and poor-quality coal that burst into flame by themselves (spontaneous combustion)
- abandoned mines where zama-zama (subsistence) miners risk their lives
- interference with farming operations where coal mining has left empty, infertile land, heaps of rock, and other debris.

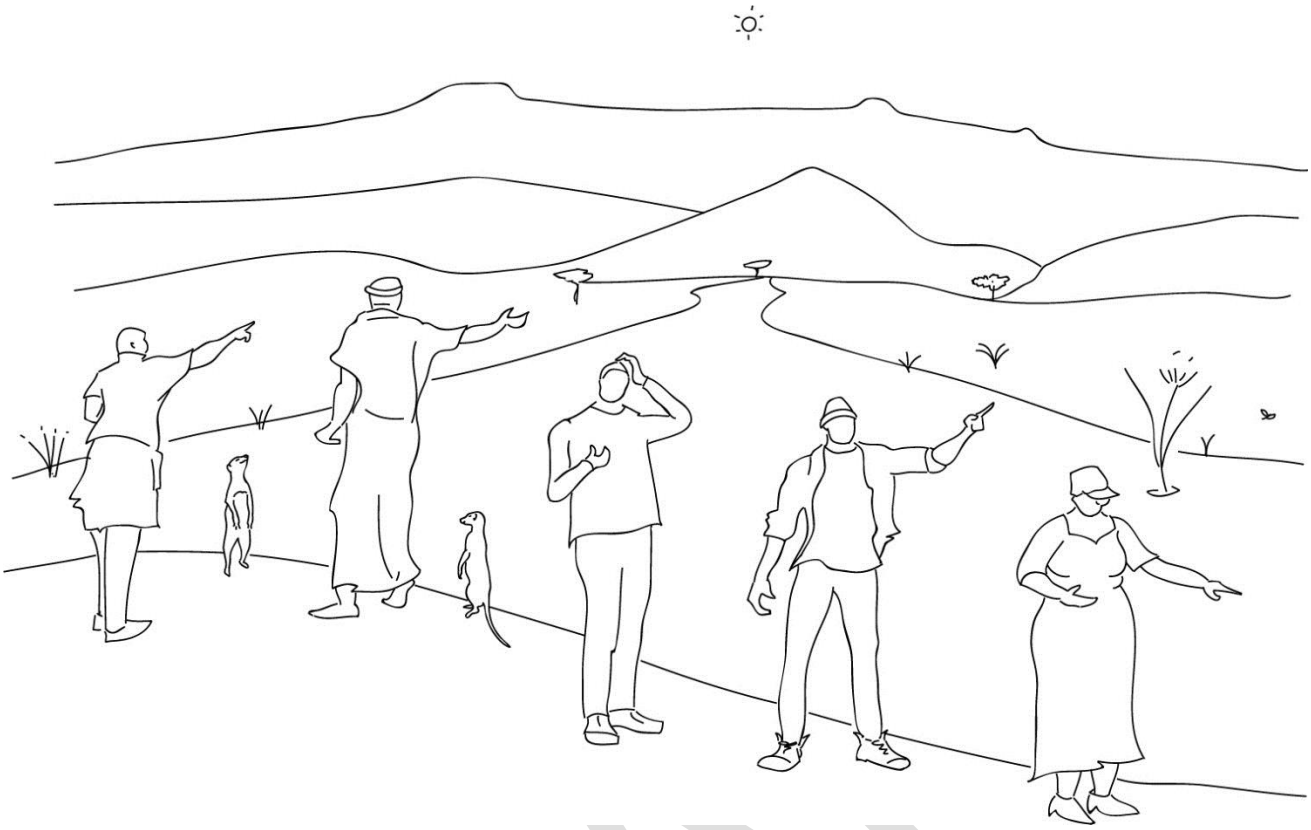
Climate change

Burning coal, especially in coal-fired power stations, is the main factor leading to climate change. Temperatures have already started rising, and a full average 1 °C increase in temperatures is expected by 2020. But the Department of Environmental Affairs (DEA, 2015) reports that in most places in Africa the temperature rises faster (about 1½ to 2 times) than the global average.



For this reason, coal should be used as a little as possible, and we should think very carefully about exporting coal to countries where it will add to climate change. In fact, coal will be used less and less for generating electricity in the future. Many big mining companies (Anglo American, Xstrata and BHP Billiton) are gradually stopping coal mining, or have gone bankrupt (Peabody Coal).

CMFs should think very carefully about which areas should be mined, and which should be left alone.



Can coal mines be rehabilitated?

The Carolina district, like most of the Mpumalanga Highveld, has many wetlands and springs. This is because of the layers of rock below the surface. The water lies above a sandstone layer, and a plinthic layer*, which is a layer of clay that stops water penetrating into the ground, and which hardens when it is exposed to the atmosphere.

Open-cast mining destroys the sandstone layer, and it is not possible to rehabilitate it. The rehabilitation that takes place consists of filling the hole made by mining with the broken rocks, putting the topsoil over them, and then fertilising and seeding the topsoil to produce a landscaped surface that might be useful for grazing. If the pasture is not good enough, the Chamber of Mines calls it ‘wilderness’, which is soil that is neither re-established wetland, arable land, nor land suitable for grazing. Rehabilitation does not re-establish the ecosystem*.

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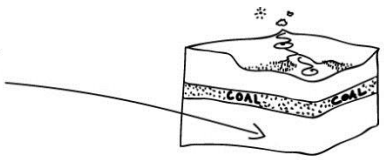

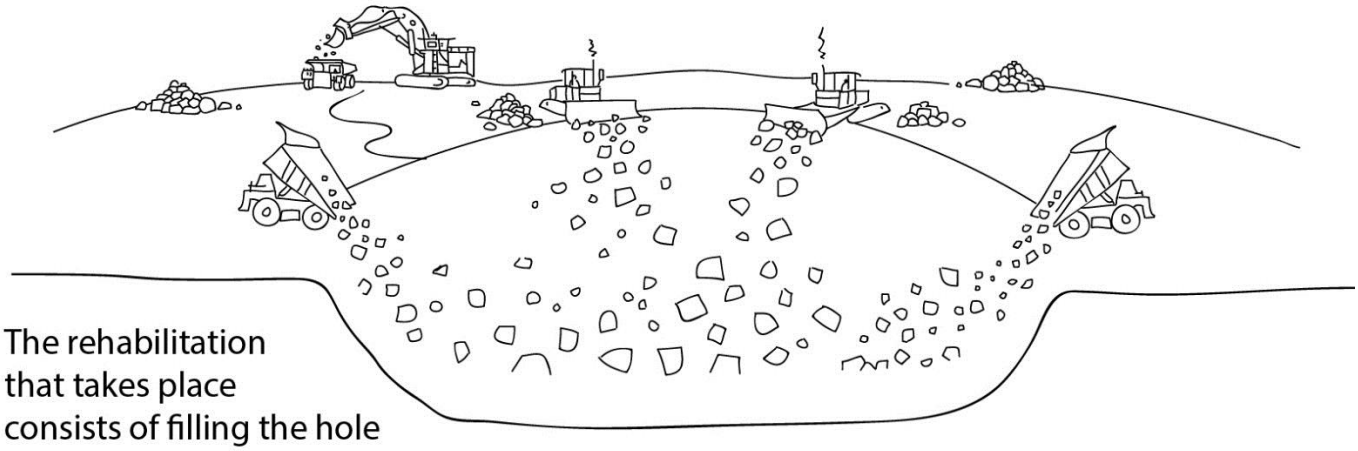

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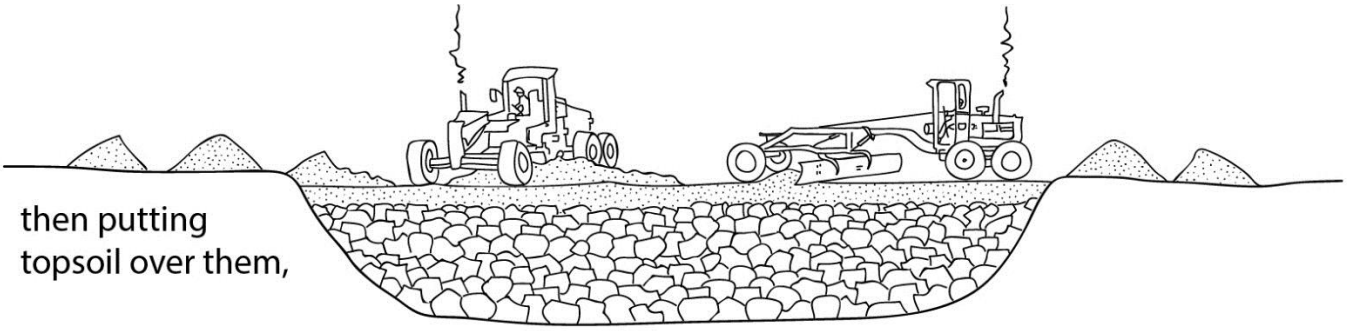
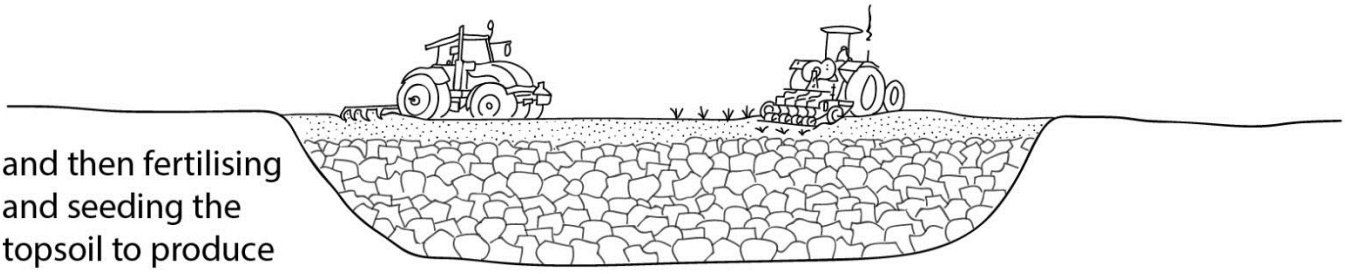


then putting
topsoil over them,



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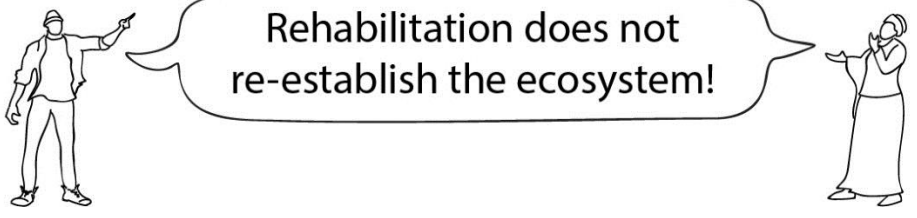


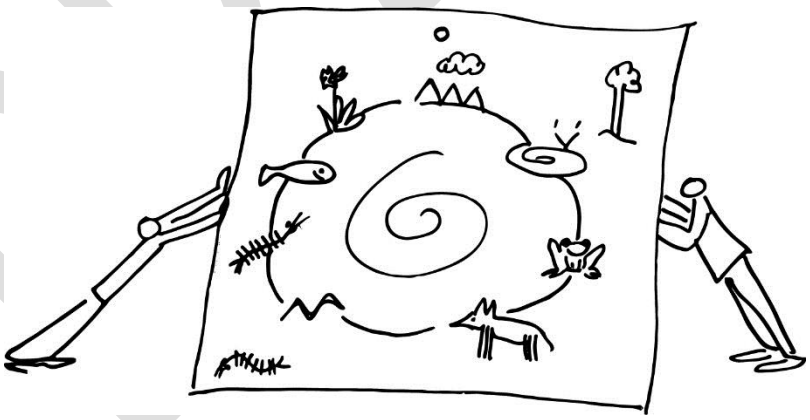
SOLUTIONS

Ecosystems

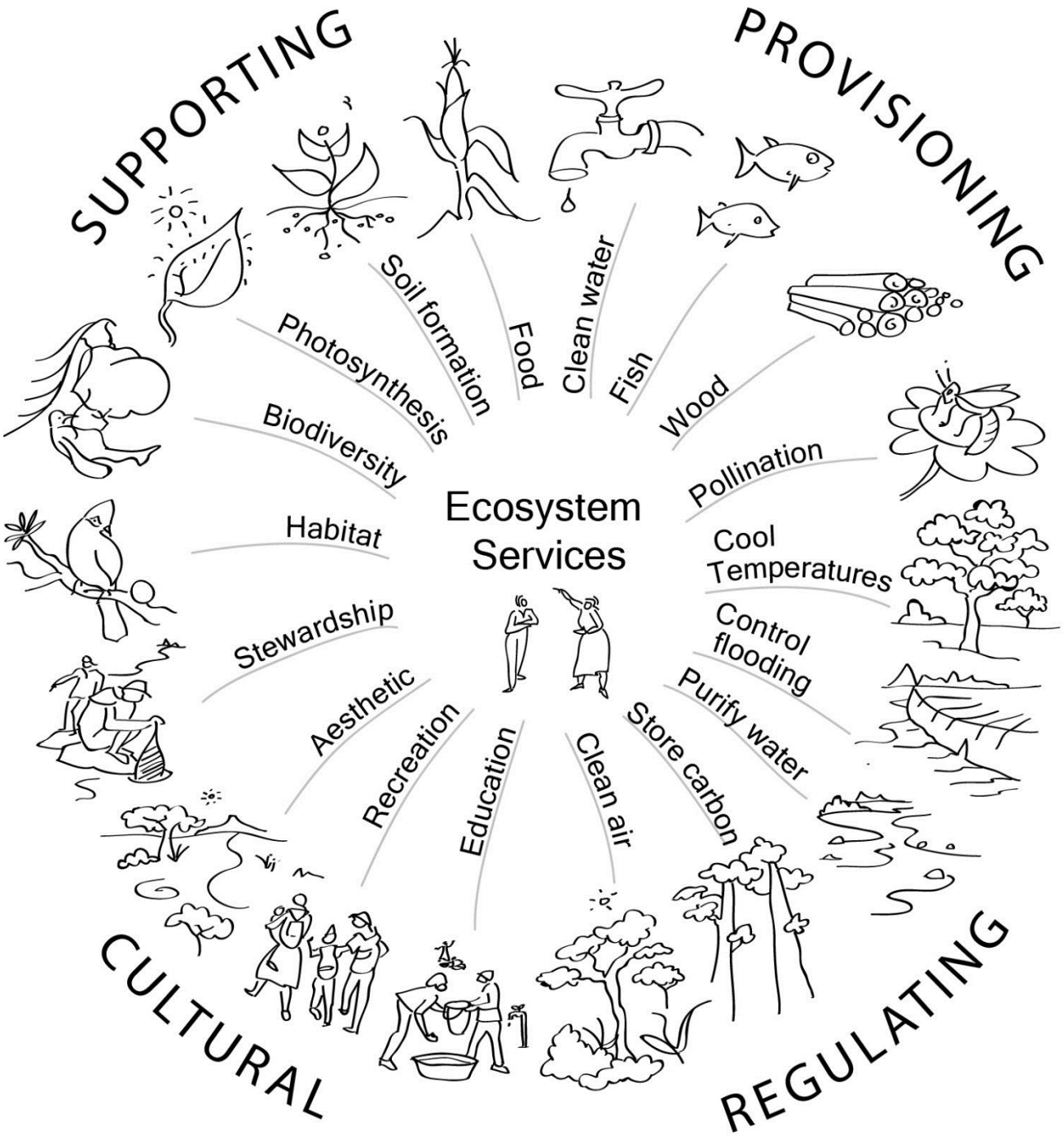
An ecosystem is a complex set of relationships among the living resources, habitats and residents of an area. It includes plants, animals, micro-organisms, water, soil, and people.

Ecosystems vary greatly in size and the elements that make them up, but each is a functioning unit of nature. Everything that lives in an ecosystem depends on the other species and elements that are also part of that ecological community. If one part of an ecosystem is damaged or disappears, it could have an impact on everything else. The ecological processes that happen in it, e.g. functions such as nutrient cycling*, water flows and dispersal keep it functioning as a whole – like the blood in your body keeps your body functioning.

When an ecosystem is healthy, we say it is sustainable. This suggests that the system works, and all the processed that are needed to reproduce the various parts of the system are working.



What do ecosystems provide?



Provisioning services: the harvestable goods or products we obtain from ecosystems such as food, timber, fibre, medicine, and fresh water.
Cultural services: the non-material benefits such as heritage landscapes and seascapes, recreation, ecotourism, spiritual values and aesthetic* enjoyment.

Regulating services: an ecosystem controls natural processes, such as climate, disease, erosion, water flows, pollination, as well as protecting us from natural hazards.
Supporting services: the natural processes such as nutrient recycling, soil formation and primary production that maintain the other services.

When is an ecosystem healthy?
Healthy, natural ecosystems can handle pressures from their environment, moving from one state to another in response to those pressures, but remaining strong. However, certain disturbances, often caused by human beings, move the ecosystem to a state in which change happens too fast, rushes through the system and ruins it.

Signs that an ecosystem is healthy:

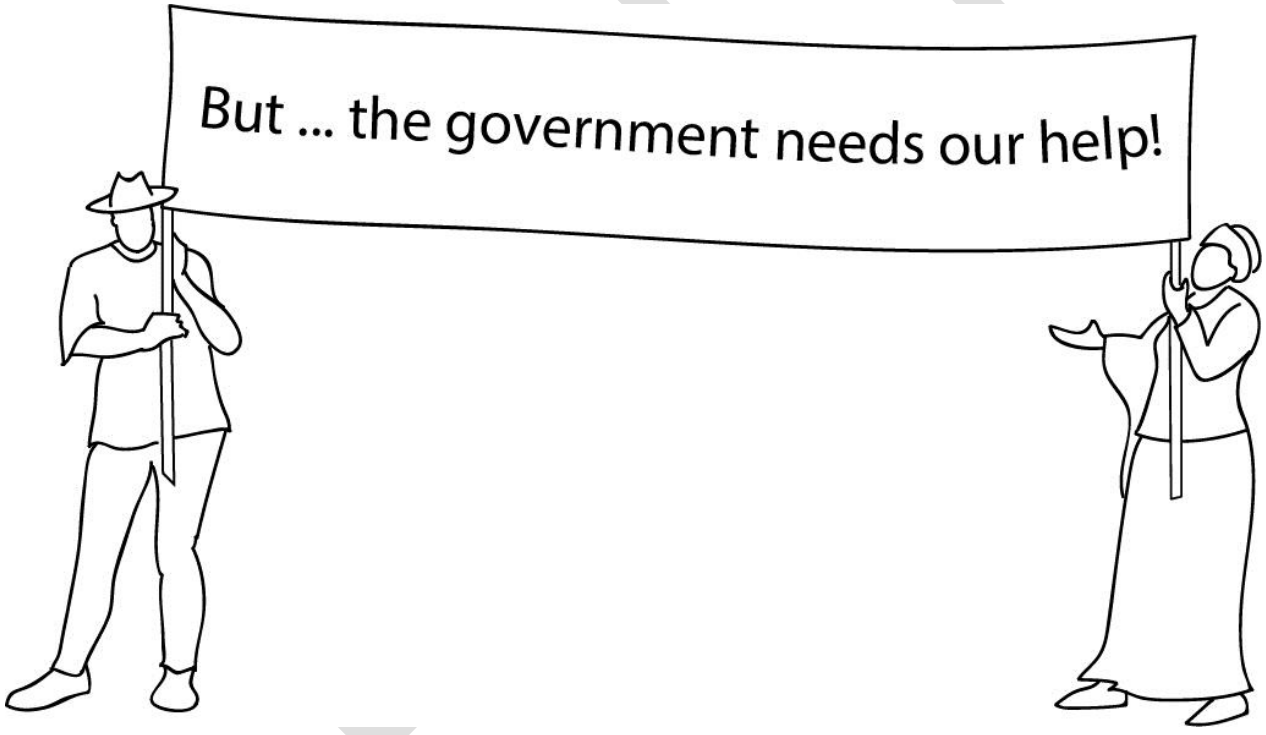
a. the system is diverse, and has a variety of plants, animals, insects, etc. in it that live and behave as they used to;
b. the processes that maintain the diversity and complexity of the system are still present.

An ecosystem can provide ecosystem services if its self-organising ability is good and strong, and that, in turn, depends on its complexity and biodiversity.

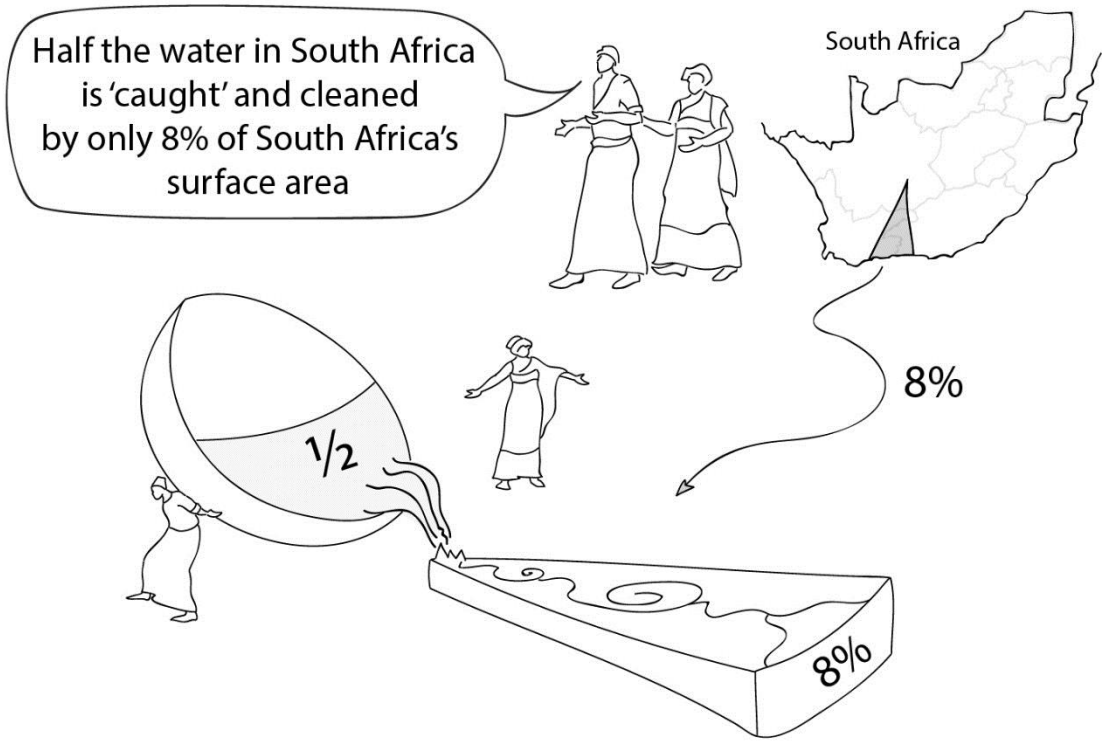
Reasons for protecting the ecosystem are similar to those for protecting biodiversity, with this difference: we value ecosystem because, when we care for it, the ecosystem provides services for humans.

Natural capital and ecological infrastructure
Policy makers and academics often refer to nature as ‘natural capital’, or ‘ecological infrastructure’.

Nature provides many services, so we need to look after it in the same way we look after roads, dams, power lines, etc. However, there are important differences. Natural capital and ecological infrastructure do not belong to anyone – they belong to everyone. We **all** need to look after them.
Legally, water and the mineral resources belong to all South African citizens, and it is the duty of the state (in the form of the Department of Water and Sanitation, Catchment Management Agencies and the Department of Mineral Resources) is to look after these resources on behalf of all South Africans – those alive today, and those who will arrive in the future.



Water resources need your protection
Half the water in South Africa is 'caught' and cleaned by only 8% of South Africa's surface area. So, an area that slightly smaller than KwaZulu Natal and Lesotho captures half the water our country needs.

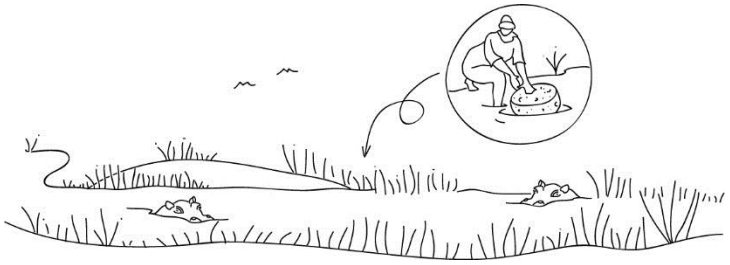


Wetlands*
Grassland areas are important because they filter and store water, and wetlands are especially important for protecting our water resources.

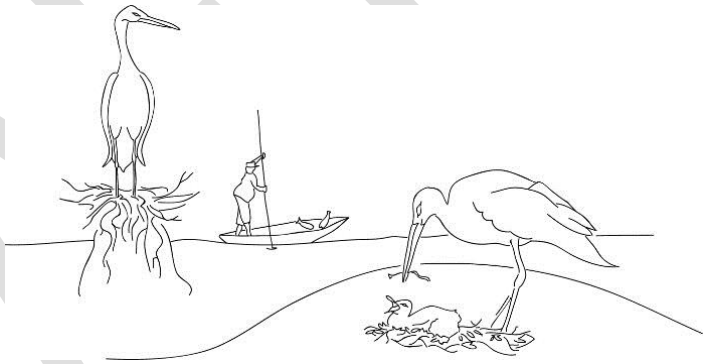
Wetlands are some of the most productive ecosystems in the world. The list below shows only SOME of the benefits they give us:

- They slow down water and create a diverse environment
- They provide a range of ecosystem services:
    - supply fresh water
    - regulate floods (storing water during floods and releasing it later)
    - control erosion (trapping eroded soil and reducing the force of water in the wetland)
    - sustain river flow after the peaks of rainfall (acting as a sponge)
    - recharge groundwater
    - provide food security
    - provide biodiversity refuges and fish nurseries
    - provide places of spiritual, tourism and recreational value

- They are natural filters. They trap pollutants and bacteria that cause disease
- Chemical processes in wetlands can convert potential pollutants like nitrates into atmospheric nitrogen which is released to the air



- Wetland micro-organisms can decompose organic pollutants such as pesticides
- They can trap heavy metals in sediment and absorb excess nutrients. Thus they filter out pollution and clean water
- They spread out the water moving through the catchment and slow it down, thus reducing floods and regulating flow
- They help recharge groundwater
- They control erosion by slowing down water flow and trapping sediments
- They provide diverse habitats to a range of plants, birds, and other animals, some of them endangered



- They trap carbon dioxide, thus reducing climate change
- They may provide grazing for wild animals and livestock (such grazing must be carefully controlled and limited to protect the wetland)
- Many provide fibre for construction and handcrafts, including cultural goods like *amacansi* mats

- Some wetland plants are collected as medicines
- Some wetlands provide fish
- Some are breeding places for waterfowl
- Many provide wonderful places for bird watching

The National Water Act needs your help!
The Act establishes 'suitable institutions and to ensure that they have appropriate community, racial and gender representation'. These are Catchment Management Forums (CMFs) and Catchment Management Agencies (CMAs).

We all need to make sure that the nation's water resources are protected, used, developed, conserved, managed and controlled in ways which take into account things like:

- meeting the basic human needs of present and future generations;
- supporting fair access to water;
- correcting the results of past racial and gender discrimination;
- supporting efficient, sustainable and beneficial use of water in the public interest;
- helping social and economic development;
- finding ways to meet the growing demand for water use;
- protecting aquatic and associated ecosystems and their biological diversity;
- reducing and preventing pollution and degradation of water resources;
- meeting international obligations;
- improving dam safety;
- managing floods and droughts.

How to monitor AMD

Monitoring is an essential part of living with coal mines in a catchment. In the case of Carolina, the AMD event of 2012 led to the installation of a detailed monitoring network in this quaternary catchment (X11B).

Monitoring is important because ... monitoring enabled forum participants to see the consequences of decisions, and use this feedback for current and future decisions. The UKF spends much of its time reviewing data based on water monitoring.

The results from these monitoring points should be presented regularly at the meetings of the CMF, at least every two months. The CMA and CMF should become familiar with the monitoring system, including **what** is monitored and **what it means**. The monitoring takes place within the overall framework of the directive given by the minister of Mineral Resources in 2012, which led to the Golder Report and the recommendations in it.

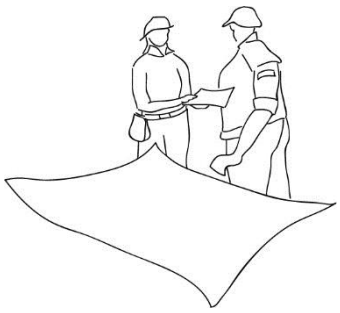
Monitoring related to coal mine impacts includes:

- Salts, monitored through electrical conductivity. Salts can form when sulphur combines with calcium and magnesium either via treatment, or naturally, as part of the buffering capacity of local soil and rocks. The Carolina catchment has a low natural buffering capacity.
- Sulphur – sulphur that may be released from coal mines and plays a role in AMD.
- pH, or acidity and alkalinity.

How to monitor coal mining

Why do we need to monitor mining? Like most of the rest of the world, South Africa is moving towards more democracy and more sustainability. This road is not easy to follow because it is new. We have to change our thinking about the way we have done things in the past (see How to Think handbook). For example, our economy relied on mining, and we've used coal to generate electricity. But now we are concerned about protecting our water resources and biodiversity, and dealing with climate change. Following this new road leads to a green economy* and democratic ways of making decisions. Catchment Management Agencies (CMAs) and Catchment Management Forums (CMFs) in which citizens protect, monitor and make decisions about our resources, and to which they bring their knowledge and energy are a way of balancing the tasks of making sure our resources meet our present needs, and making sure there will still be resources for our children and grandchildren.

Integrated Monitoring Plan and Decision-Making System (developed in consultation with UKF). These ten steps will take time to implement, but they guide CMAs and CMFs towards integrating and balancing mining development and protecting ecological infrastructure and biodiversity.



ONE

Compile a regional-scale (for example on quaternary catchment scale but nested in bigger scales, such as provincial plans, catchment management strategies) overview of existing ecological infrastructure (water resources, biodiversity, climate and soils for agriculture). This forms part of the Decision Support System. They need to be analysed in terms of ecological infrastructure as they might not be expressed in that form.

List authorities and their roles.

These plans must be found, brought to the attention of stakeholders and participants in the CMF. The plans are worked through in capacity-building exercises, and then are accessible to all members of the CMA and CMF, both in terms of detail – an URL or on a website – as well as an executive summary for immediate use. All decisions depend on understanding these plans.

TWO

Gather all stakeholders to discuss and establish an overview of land use options and the reasons for choosing those options – cultural resources, needs for historical redress including land claims, options for land use and Integrated Development Plans (IDPs).

There may be conflicting agendas among stakeholders, but if the discussions are carried out in an atmosphere of respect and mutual understanding, agreement (if not consensus) can be reached. The advantage of the discussions is that a deeper understanding of a complex situation becomes clearer and trade-offs are possible, or can at least be put into words. All voices should be heard, and options should be considered in the long-term rather than in the immediate or short-term.

THREE

Develop directions for long-term development in terms of the National Development Plan, including options for (and resources needed for) a changeover to the green (low carbon) economy. This involves assessing current economic activities and their impacts, and imagining the change from what is practised now to what the future may be. This discussion should be part of any decisions about coal mining and water.

FOUR

Assess coal mining options in terms of:

- 4.1 benefits to the national and local economies
- 4.2 impacts on hydro-ecological-infrastructure (water resources, the ecological infrastructure)
- 4.3 whether proceeding with coal mining would make competing land uses and other development options impossible in future
- 4.4 future costs of rehabilitation and restoration of land (eco-infrastructure).

Based on the plans developed in Step 3 above, assess the current and proposed future uses of ecological infrastructure in terms of how those uses relate to current economic activities, and also how they support or eliminate future uses of ecological infrastructure in a green economy. These discussions should happen in an atmosphere of respect for each other and as a result of empowerment and dialogue-type facilitation.

FIVE

Weigh up the options in terms of their sustainable use and impact on eco-infrastructure, future land use and development options, benefits and costs, and need (socio-economic need).

Stakeholders discuss and negotiate, in their own and other forums, such as the local government's Integrated Development Plan processes, departmental processes and in terms of SPLUMA*, how these options contribute to public welfare and the public interest. Stakeholders in the CMFs act as protectors of hydro-ecological-infrastructure. These discussions must happen on a level playing field with empowerment and facilitation for dialogue.

SIX

The knowledge that comes out of these discussions forms the basis of a monitoring system that is supported by legal instruments, for example water-use licences, mining authorisations, social and labour plans, etc.

For the monitoring system to be effective, stakeholders within the catchment area must be able to access, read and comment on these legal instruments, and must be helped to understand and use them. Stakeholders should automatically have access to this information, and actively participate in processing them. Access to the information should be free and straightforward; there should be no legal costs involved. Mines' compliance is made public in a system similar to the Green and Blue Drop incentive schemes.

SEVEN

The decision-making and monitoring system is streamlined in terms of a principled pragmatic approach to IWRM (Integrated Water Resources Management). Documents are concise, accessible and honest.

Decisions and information are written in easily understandable language, are of a reasonable length, and present the relevant conclusions in an understandable way, making it clear, for example, who polluters are, or what the potential for pollution is. Technical data and analysis should be available in appendices, and stakeholder or interest groups have access to publicly-funded technical support to cross-check the conclusions presented and the data and the analysis that these conclusions are based on. Annual reports give information about monitoring results.

EIGHT

Relevant departments participate in and assist this process by offering specialist knowledge, sharing and considering inputs, and supporting participation, especially of historically disadvantaged groups, through capacity building.

All departments understand their duty to invite and support public participation, including through regular capacity building. They have dedicated officials, such as those in CMAs, for this task. These tasks can also be undertaken by civil society organisations or Chapter 9 institutions, with regular monitoring and evaluation by the participants who are supported in this way. These functions are Key Performance Indicators (KPIs) for these departments, according to the principles of *Batho Pele*. The system is underpinned by easy access to information. Media is used extensively and public awareness is built and maintained.

NINE

The CMA co-ordinates the process in terms of water issues. National departments assure alignment and integration with national priorities, through task teams (such as the current AMD task team), with a focus on job creation, to changing to a green economy, etc.

Because water is central to most of these land-use options, the Catchment Management system will become stronger through the opportunities for co-operative governance, clear role descriptions and integration of land use plans. Processes to develop, update and extend Catchment Management Strategies are ideal opportunities for this function.

TEN

The Upper Komati Catchment Forum developed a Decision Support System through knowledge of the networking process, as a linked constellation of knowledge resources, including precedents of decision making. Knowledge sources are developed, archived and made accessible, for example, through websites linked to the IUCMA, national, provincial and local governments, as well as civil interest groups. See the section on knowledge resources in this brochure.

STEPS TO GETTING MINING PERMISSON

List of Acronyms:

BAR = Basic Assessment Report
DMR = Department of Mineral Resources
EA = Environmental Authorisation
EIA = Environmental Impact Assessment
EIAR = Environmental Impact Assessment Report
EMPR = Environmental and Management Programme
I&AP = Interested and Affected People
NEMA = National Environmental Management Act

ACTIONS – Mining company	**ACTIONS – CMFs and CMAs**
A mining company applies to the DMR for the right to prospect/mine right. At the same time, the mining company must apply for environmental authorisation for their proposed mining / prospecting operation.	Register as an Interested and Affected Party (I&AP) which gives you the right to comment on the Mining Application

If the mining company satisfies the preliminary requirements, the DMR will notify the mining company that it accepts the application. *This does not mean that the application is successful.*	
Once the application is accepted, the DMR must (a) instruct the mining company to submit relevant environmental reports (see below); and (b) notify potential interested and affected parties (I&APs) about the proposed mining/prospecting operation. Notices must be put up in various places: DMR offices, Magistrate's Courts, etc., and be published in a local newspaper. Other actions must be taken to make sure that owners and occupiers of the affected land are specifically notified. The notice in (b) should call on Interested and Affected Parties to comment on the application. The mining company must include details of how and to whom to make comments.	If you want to object to or to make comments on a proposed mining/ prospecting operation, you <u>must</u> register as an I&AP. The mining company must keep a list of I&APs. It is important to register as an I&AP because I&APs have an opportunity to make comments on the application process and the various reports and assessments submitted by the mining company to the DMR. Make sure you get notification of the proposed mining/prospecting operation. Make sure you can attend the meeting. Check the notice to see what you have to do in order to submit your comments to the mining company.
In order to obtain a mining /prospecting right, a mining company must submit various documents to the DMR, including: <u>Mining/prospecting right application: Social and labour plan</u> - the role the mining company will play in local	

economic development and job creation during the lifetime of the mine; Draft prospecting/mine works programme: where and how the mining company may mine/prospect; and Environmental Authorisation (EA) application: EAs are issued in terms of the National Environmental Management Act (NEMA). In order to obtain environmental authorisation for mining, a mining company must follow the process for a 'scoping and Environmental Impact Assessment' (EIA). Note: a mining company is only required to submit a scoping report when it is applying for a mining right. When a mining company applies for a prospecting right, a Basic Assessment Report (BAR) is required	
Application for an EA (Environmental Authorisation): the mining company prepares a draft scoping report, showing the broad context of the proposed mining operation. It must explain why the proposed mining operation is necessary and desirable, and explain how the impacts of the proposed mine will be reduced. A copy of the draft scoping report must be made available to all registered I&APS. The mining company must hold a public meeting	Get a copy of the draft scoping report. Read it carefully and attend the public meeting that the mining company arranges. Submit your comments in writing. If an I&AP is given a draft report at a meeting, s/he should not have to comment on that report at the same meeting. That is then an information meeting, which is different from a public consultation, when comments should be submitted.

with I&APs regarding the draft scoping report. I&APs must be given an opportunity to make comments about the draft scoping report at the meeting. Registered I&APs may submit written comments on the draft scoping report.	
Application for an EA: If the DMR accepts the draft scoping report, the mining company will be instructed to prepare two documents: (a) a draft Environmental Management Programme (EMPR) which sets out how the mining company proposes to reduce and manage the impacts of the mine on the environment and how the mining company must rehabilitate the environment after the mining operation is complete; and (b) in the case of a mining right application, an Environmental Impact Assessment Report (EIAR) which is a study which assesses how the mine will impact on the environment. In the case of a prospecting right application, the company prepares a BAR, which sets out the environmental outcomes, impacts and residual risks of the proposed prospecting operation.	
Application for an EA: the mining company must hold another meeting with I&APs about the draft EMPR and EIAR/BAR. The mining company will submit the draft EMPR	I&APs meet with the mining company to discuss the EMPR and EIAR/BAR. I&APs have the opportunity to make comments and the meeting, and to submit written comments.

and EIAR/BAR to the DMR together with the comments from I&APs.	
Application for EA: After considering the draft EMPR and comments from I&APs, the DMR may approve or reject the draft EMPR. If the DMR approves the EMPR, it must consider the EIAR/BAR and the comments from I&APs. After considering the EIAR/BAR and the comments by I&APs, the DMR may grant or refuse an EA to the mining company. All registered I&APs must be notified of the decision by the DMR to grant or refuse an EA.	Make sure you receive notification about whether the DMR has approved or refused an EA to the mining company.
	Anyone may lodge an appeal to the Minister of Environmental Affairs against a decision by the DMR to grant an EA. The EA may not carry on until the appeal is decided. The Minister of Environmental Affairs may uphold or dismiss the appeal.
If the DMR grants an EA, it must decide whether or not to grant a mining/ prospecting right to the mining company in question. In making that decision, the DMR must consider all the information in the Social and Labour plan, the EA application and the prospecting/mining works programme, as well as any comments or objections from I&APs.	All registered I&APs must be notified of the DMR's decision to grant or refuse a mining/prospecting right application.

	Anyone may lodge an appeal with the Minister of Mineral Resources against a decision of the DMR to grant a mining/prospecting right to a mining company. On request from the appellant, the Minister of Mineral Resources may decide whether or not to suspend a mining right pending the outcome of the appeal. The Minister of Mineral Resources may uphold or dismiss the appeal.

Checklist of documents for a mining operation:

1	Copy of application to DMR for i) a mining right and ii) an environmental authorisation
2	Notification from DMR that the application was accepted.
3	Reports: - Social and labour plan. - Draft mine works programme. - Environmental Authorisation (EA) application including the draft scoping report.
4	Copy of meeting notice to interested and affected parties (that should include an invitation to comment on the application, and lists of places where these notices were posted). Evidence that the draft scoping report was available. List of affected landowners who were notified individually.
5	List of registered I&APs; confirmation they were sent the draft scoping report in advance of the meeting.
6	Evidence that the draft scoping report was sent to DMR with all comments received.
7	Acceptance of DMR of draft scoping report.
8	Reports: - Draft Environmental Management Programme (EMPR). - Environmental Impact Assessment Report (IEAR).
9	Copy of meeting notice to interested and affected parties (it should include an invitation to comment on the application, lists of places where the notices were posted). Evidence the draft scoping report was available. List of affected landowners who were notified individually.
10	List of registered I&APs; confirmation they were sent the EMPR and EIAR in advance of the meeting.
11	Evidence that IAPs were alerted to the chance to appeal.

Glossary

acid mine drainage (AMD) – the acidic water that is created when sulphide minerals are exposed to air and water through mining, and produce sulphuric acid. The water is dangerous for people who use the water, and plants and animals that live in it.

acidification – to make or become acid. Something that is acid has a pH value lower than 7 (see pH below).

alkaline – the opposite of acid. Something that is alkaline has a pH value greater than 7 (see pH below). Alkaline solutions can be used to reduce acid solutions.

biodiversity – The variability among living organisms from all sources including, land, marine and other aquatic ecosystems and the ecological complexes of which they are part and also includes diversity within species, between species and of ecosystems. Biodiversity is important for healthy ecosystems.

buffering – the ability of soil to reduce or neutralise acid.

decant point – the place where water that has separated from sludge and mud flows from.

ecosystem – different communities of living things and their environments, as well as their many interactions.

ecological infrastructure – naturally functioning ecosystems that produce and deliver valuable services to people, such as water and climate regulation, soil formation and flood reduction.

green economy – an economy that aims to reduce environmental risks and develop sustainably without damaging the environment.

heavy metals – these are metals like aluminium, chrome, cobalt, copper, lead, iron and manganese. They can poison fish, animals and people.

iron sulphate – a salty-tasting mineral that dissolves in water. It is used to make other salts, to purify water, make fertilizer, and for medicine to treat anaemia.

neutralise – to stop something having an effect, e.g. alkaline solutions can neutralise acidic water.

nutrient recycling – the movement and exchange of organic and inorganic matter into producing living matter, e.g. animals eat plants and then excrete them as manure. Microorganisms break the manure down so that the plants can use it to grow and produce food for animals once again. Ecosystems use biodiversity to recycle the nutrients that sustain all human societies.

overburden – (also called waste or spoil) the material above the coal seam, for example, the rock, soil and ecosystem.

pH – a measurement of how acid or alkaline water is. The scale of measurement goes from 1–14. Low pH values are acid; high pH values are alkaline (or basic).

plinthic layer – a type of soil that becomes very hard when it is repeatedly wetted and dried.

prospecting holes – holes that are drilled or dug as experiments to see whether it is economically possible to mine an area.

rehabilitate – to restore a place to its previous condition.

sandstone – sedimentary rock composed mainly of sand-sized minerals or rock grains.

SPLUMA – Spatial Planning and Land Use Management Act 16 of 2013.

subsidence – the collapse of the rocks and earth above a mine.

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Useful contacts
Coaltech, www.coaltech.co.za
Centre for Environmental Rights, www.cer.org.za
Inkomati-Usuthu Catchment Management Agency, www.inkomaticma.org.za
Department of Mineral Resources, www.dmr.gov.za
Department of Water and Sanitation, www.dws.gov.za
Foundation for Sustainable Environments, www.fse.org.za

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