The Cost of Gold:
Environmental, Health, and Human Rights Consequences of Gold Mining in South Africa’s West and Central Rand
Harvard Law School International Human Rights Clinic
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Gold Mining in South Africa's West and Central Rand

Summary and Recommendations

Cover Illustration
The poor community of Soul City Extension 2 sits near a gold mine waste dump in the West Rand. Mining has produced contaminated water and tailings dams that have threatened the local environment, residents' health, and human rights.
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Methodology

This short publication reproduces the summary and recommendations of a 113-page report that provides a comprehensive, in-depth analysis of the environmental, health, and human rights consequences of gold mining in South Africa’s West and Central Rand. The full report is available online.1

The report is based on a combination of fieldwork and desk research. The Harvard Law School International Human Rights Clinic (IHRC) conducted on-the-ground investigations in South Africa in 2014, 2012, and 2010, and updated its information through phone interviews in 2016 and 2015. During that period, IHRC researchers interviewed about 200 people from a variety of spheres. They visited more than 20 communities in the West and Central Rand in order to speak to residents of informal and formal settlements. The researchers also interviewed government officials, especially from the national government, representatives of several mining companies, civil society advocates, scientists, and other experts. (Citations identify interviewees with the title they held at the time of the interview.) While in the West and Central Rand, IHRC investigators went on site visits to observe first hand the environmental effects of mining and the activities that have exposed local residents to its contamination.

IHRC supplemented the testimony it collected with a wide range of other sources. IHRC researchers drew on government and industry documents, scientific studies, news reports, and histories of the region. In addition, they identified and applied the most relevant pieces of South African, international, and regional human rights law, which provide an analytical framework for this report.

1 www.website link when available.pdf
The discovery of major gold deposits in the Witwatersrand Basin in 1886 marked a turning point in the history of South Africa. The gold rush that followed sparked an economic boom, which attracted wealthy mining magnates and then national and multinational corporations. It also gave rise to South Africa’s largest city. Since its earliest days, however, the industry has endangered the environment and health of the people who have made the region their home. Ongoing mining activities combined with the legacy of 130 years of operations have caused water, air, and soil contamination in the West and Central Rand, an area encompassing Johannesburg and its surroundings. Residents have been exposed to elevated concentrations of heavy metals and radiation that can contribute to immediate and long-term medical problems ranging from asthma and skin rashes to cancer and organ damage. Furthermore, the local people have been largely excluded from decisions about how to deal with the dangers. The situation has particularly affected impoverished, and frequently black, communities.

Over the past five years, the South African government has taken some noteworthy steps to address the adverse impacts of gold mining, but it has failed to live up to many relevant human rights obligations. Its response to the crisis in the West and Central Rand has generally been slow and insufficient. As a result, mining has not only created environmental and health risks, but it has also prevented community members from realizing numerous human rights. Widespread contamination has raised concerns under the rights to health, a healthy environment, water, and housing, while inadequate community engagement has interfered with the rights to receive information and participate in decision making. To remedy the situation, South Africa should adopt a coordinated and comprehensive program that both mitigates the effects of mining and helps the country meet its responsibilities under domestic, international, and regional human rights law.
This report provides a fresh look at the problems posed by gold mining in the West and Central Rand because it examines them through a human rights lens. It is based on three field trips to South Africa and about 200 interviews conducted by the International Human Rights Clinic (IHRC) at Harvard Law School. The report documents the effects of mining on local residents and assesses efforts to deal with them. While recognizing that industry and community involvement is essential to addressing the situation, the report focuses on the actions of the government, which has a legal obligation to guarantee human rights. The report directs most of its recommendations to the government as a whole because South Africa is better situated to assign tasks to specific agencies.

Part I of the report provides context by laying out the historical background and legal framework. Chapter 1 discusses the history of gold mining in the Witwatersrand and the evolution of human rights in South Africa, while Chapter 2 explains the most relevant provisions of domestic and international law. Part II presents the study’s factual findings and legal analysis. Chapters 3 and 4, which address acid mine drainage (AMD) and tailings, respectively, document exposure pathways, describe potential health impacts, and evaluate government responses. Chapter 5 illustrates and critiques how communities have been given limited information and few opportunities to participate in decisions about mining that affect their lives. Chapter 6 concludes by highlighting the need for a coordinated and comprehensive program to resolve the situation.

**Historical and Legal Context**

Gold mining has been both a boon and a burden for the West and Central Rand, which makes up a large portion of the Witwatersrand. Mining has played an integral part in the region’s economic growth for more than a century, but from its earliest days, it has caused environmental damage. Because the industry contributed to the establishment and survival of the decades-long apartheid regime, the government had little incentive to regulate mining’s harmful effects during that period.

Since the end of apartheid, South Africa has continued to receive economic benefits from mining, but the industry has operated in a different context. The new government has demonstrated its commitment to human rights through its national constitution and ratification of international treaties. As a result, the effects of mining and the government’s response should now be assessed within a human rights framework.

**Environmental Contamination**

Gold mining has released highly toxic contaminants into the environment of the West and Central Rand for more than a century. In the process, it has raised concerns under several economic, social, and cultural rights. For the South African government to meet its corresponding obligations, it should take steps to remedy ongoing harm and prevent additional effects in the near term as well as to develop a more complete solution for the future.

The pollution of the region’s ground and surface water with acid mine drainage has implicated the rights to health, a healthy environment, and water. AMD is produced when water and oxygen mix with sulfides exposed by mining activities, and it contains elevated concentrations of heavy metals, which are in some cases radioactive. Community members have indirectly ingested AMD, especially by eating vegetables irrigated with the polluted water, meat from cattle that have drunk from local waterways, and fish from contaminated bodies of water. AMD neutralized at the West Rand Treatment Plant has flowed for several years through this pipe and manmade trench to a nearby pit, where heavy metals have precipitated. The water, which has continued to the Tweelopiespruit in the background, however, has retained dangerously high sulfate levels.

Local people have also been exposed through skin contact that has occurred when they have washed clothes or swum in tainted lakes and streams. Residents told IHRC that they have suffered from skin rashes after exposure, and studies done in other parts of the world have documented long-term health impacts, such as cancer and organ damage, from the same contaminants.

In recent years, the government has pumped and partially treated the AMD, but this positive step was overdue and a more complete solution has been wanting. A treatment facility that came online in 2014 prevented AMD from decanting, i.e., reaching the surface, in the Central Rand. AMD in the West Rand, however, began decanting in 2002, and the government only assumed primary responsibility for treatment in 2012. The treatment plants have fallen short of a complete solution because they have only neutralized the water, leaving high concentrations of sulfates and other salts that can cause acute health effects and make water unsuitable for such activities as drinking, bathing, washing clothes, and watering livestock.

Desalination, a more thorough treatment process, has been needed to improve water quality and to reduce the strain on South Africa’s limited drinking water supply, which has been used to dilute the neutralized water. Recognizing this need, in May 2016 the government announced a plan to construct desalination facilities, which it said would be fully operational by 2020. The project holds promise, but its success depends on the government implementing it effectively and in a timely manner. The government must also address other major sources of AMD, such as rainwater runoff and underground seepage from mine waste sites.
Contaminated dust and soil from omnipresent hills of mine waste have interfered with the enjoyment of the rights to health, a healthy environment, and housing. There are more than 200 such waste dumps, known as “tailings dams,” in the Johannesburg area, and like AMD, they contain elevated concentrations of heavy metals, including radioactive uranium. Contaminated dust has filled the air and blanketed communities, leading to widespread complaints of asthma and other breathing difficulties. In addition, the location of many settlements near or even on top of the tailings dams has endangered residents, who have indirectly ingested food grown in the soil, had skin contact with the toxins, or used mud in traditional medicines. In better studied parts of the world, the contaminants in tailings have been found to cause serious health problems, similar to those from AMD.

Government efforts to minimize the effects of tailings have been largely incomplete, short-term fixes. The government’s most notable accomplishment has been to relocate some residents of the informal settlement of Tudor Shaft, who were at particular risk because their homes stood directly on a radioactive tailings dam. The government has permitted new construction near other dams, however. In addition, it has neither pursued adequate dust control measures, such as irrigation and vegetation of tailings dams, nor ensured that industry has taken inadequate steps to develop a more complete solution to the root causes of polluted dust and soil—which, the tailings dams themselves. Mining companies have extracted and removed some heavy metals through remining, but government oversight seems to have been insufficient to minimize the side effects of the process, which both stir up dust and increases AMD. The government has also left companies to take the lead in designing and evaluating proposals to move tailings from urban dams to isolated mega dumps.

**Inadequate Information and Participation**

The government’s poor track record of communicating and engaging with residents about mining matters has been almost as problematic as the adverse effects of mining operations. It has prevented local people from fully exercising two key civil and political rights—the right to receive information and the right to participate in decision making. Community members have complained, for example, that the government (along with industry) has not provided ample warnings about potential risks or advance notice of mining activities or remedial measures. In addition, while contamination levels have been well documented, there has been a shortage of epidemiological studies regarding the effects of mining contamination on human health in the region. The lack of such information has undermined residents’ abilities to protect themselves or advocate on their own behalf. Over the past few years, the government has funded some new scientific research into the health impacts of AMD and tailings, and the World Health Organization (WHO) and North-West University have sponsored a study on uranium exposure in the West and Central Rand. South Africa should be more proactive, however, in collecting and disseminating information to the local population.

In many cases, government agencies have also failed to engage meaningfully with communities about mining issues that could affect them. Residents have reported being left out of discussions related to nearby operations or their own relocation. Frustration at the lack of engagement has led to violence, litigation, and feelings of mistrust. To meet its human rights obligations, the government should increase the participation of community members in decision making. Their participation could produce more effective policies to address the impacts of mining in the West and Central Rand and increase community buy-in for long-term plans.

**A Coordinated and Comprehensive Program**

South Africa should adopt an overarching program dedicated to realizing the human rights threatened by mining in the region. According to Government of the Republic of South Africa v. Grootboom, a seminal South African Constitutional Court case regarding the right to housing, a “reasonable” program to progressively realize rights should be coordinated and comprehensive. To date, South Africa’s efforts in the West and Central Rand have failed to meet the Grootboom standard. The complex web of responsible government agencies and repeated legislative changes to that organizational structure have impeded the development of a coordinated plan to deal with the negative effects of mining. The limited scope of action, inadequate attention to at-risk communities, and insufficient consideration of environmental concerns have undermined the completeness of any response. A coordinated and comprehensive program to deal with the situation in the West and Central Rand should follow the Grootboom model and address each of these shortcomings.

A holistic perspective could further minimize the harm caused by mining in the region. It would take into account the connection between AMD and tailings, recognize the importance of linking protection of the environment and human health with community engagement, and allow the government better to prioritize tasks and marshal finite resources. Implementation of such an approach would ultimately help minimize the adverse impacts of mining while promoting human rights.
Recommendations

Mitigating the environmental, health, and human rights impacts of gold mining in the West and Central Rand will require a significant commitment from the South African government. The government will need to employ practical and legal fixes, improve interactions with local communities, and adopt an overarching plan that is coordinated and comprehensive. Communities and mining companies should contribute to these efforts, including by bringing to the task an open mind and a willingness to cooperate. The government should play the lead role, however, given the risk of a collective action problem and the inadequate measures taken by industry to date. In addition, the state bears primary responsibility under human rights law for preventing infringement of its people’s rights.

The South African government should take the following steps to address the mining problems in the region and advance realization of the relevant human rights:

Environmental Contamination
- Adopt measures to remedy ongoing harm from environmental contamination, such as:
  - Ensuring cleanup of polluted areas,
  - Providing free health screenings and access to medical care for at-risk populations, and
  - Considering a regime to compensate those harmed by the adverse effects of mining;
- Minimize the risks of further harm from acid mine drainage by:
  - Ensuring water treatment plants are adequate to prevent decanting, including during heavy rains and other severe weather events,
  - Implementing plans to upgrade water treatment in the region from neutralization to desalination as soon as possible, but no later than the scheduled 2020 deadline,
  - Monitoring water levels and degrees of contamination,
  - Requiring companies to reduce spillages from pipes transporting mining waste, and
  - Improving control of runoff and seepage from tailings dams, including through better enforcement of existing laws;
- Minimize the risks of further harm from mine tailings by:
  - Ensuring implementation by the government and industry of dust control measures, such as irrigating or planting vegetation on tailings dams,
  - Prohibiting the use of tailings dams for leisure biking and other recreational activities that stir up dust,
  - Relocating residents who live in areas at high risk from mining contamination and who wish to move to a safer environment, and providing them with adequate housing,
  - Requiring a larger buffer between new construction and existing tailings dams,
  - Adequately regulating and overseeing remining operations to minimize the side effects of disturbing old tailings,
  - Working with communities and mining companies to develop and implement a long-term strategy that deals with the prevalence of tailings dams in populated areas, and
  - Ensuring its efforts encompass both privately owned mine sites and legacy mines that have reverted to the state.

Inadequate Information and Participation
- Ensure that the public and especially members of affected communities receive information related to the risks posed by mining, including by:
  - Educating, or requiring mining companies to educate, the local population about the dangers of mining contamination and ways to limit exposure through awareness-raising mechanisms, such as warning signs and community workshops,
  - Encouraging and supporting epidemiological studies of the health effects of mining in the West and Central Rand,
  - Providing advance notice of new mining and remining activities and remediation plans, and
  - Disseminating information in a form that is accessible and understandable to laypeople;
- Ensure that community members have the opportunity to participate in decision making about mining activities that affect their lives, including by:
  - Holding regular meetings with relevant stakeholders, including community members, civil society, and industry, to have constructive discussions about dealing with the problems of mining in the region,
  - Engaging meaningfully, and requiring mining companies to engage meaningfully, with affected residents about specific projects, such as those that involve remining or relocation,
  - Working with communities jointly to design constructive forums for regular contact as well as proper engagement mechanisms for specific projects,
  - Encouraging affected people to take part in these processes and voice individual and community concerns, and
  - Taking community perspectives into account when determining policies.

A Coordinated and Comprehensive Program
- Design, resource, and implement a coordinated and comprehensive program to address the adverse effects of mining in the West and Central Rand;
- Build on the criteria for a “reasonable” program laid out in the South African Constitutional Court case Grootboom;
- Meaningfully engage communities and industry in the design of the program;
- Promote coordination by:
  - Establishing a focal point to lead the design and implementation of the program and to organize the relevant actors,
  - Creating a clear and stable division of responsibility among government entities with jurisdiction over mining matters, and
  - Providing legislative support, including in the form of necessary resources;
- Ensure comprehensiveness by:
  - Taking immediate preventive and remedial actions as well as developing and implementing long-term strategies to eliminate the root causes of the problem,
  - Devoting adequate attention to the needs of the most at-risk communities, and
  - Following a balanced approach that takes into account environmental and health concerns as well as economic benefits;
Adopt a holistic perspective that:
- Takes into account the connection between AMD and tailings,
- Links efforts to protect the environment and human health with those to engage communities, and
- Provides an overarching understanding of the problem to facilitate prioritization of tasks and marshaling of resources.

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Gold mining has brought risks as well as riches to South Africa’s West and Central Rand. This region, encompassing Johannesburg and its environs, contains one of the largest gold deposits on earth. The extraction of this resource has left a dangerous legacy.

Based on more than 200 interviews and in-depth desk research, *The Cost of Gold* illuminates the environmental and health consequences of gold mining. In particular, it shows how the industry’s adverse effects have compromised South Africans’ human rights.

Gold mining has contaminated water, soil, and air with elevated levels of heavy metals, including uranium. Local people have been exposed to acid mine drainage when using local waterways for agriculture, laundry, or recreation. Residents have also inhaled dust from toxic and radioactive mine waste dumps, known as tailings dams.

While the government has taken some noteworthy steps to address the situation, its response has generally been slow and insufficient. It has not fully met its obligations to ensure that South Africans in the West and Central Rand can exercise their rights to health, a healthy environment, water, and housing.

The government has also failed to engage adequately with affected residents, thereby infringing on their rights to information and participation. Community members have received limited warning of the threats they face and been denied a voice in decisions regarding new mining operations and efforts to address the impacts of old ones.

*The Cost of Gold* calls on the South African government to adopt a coordinated and comprehensive program to deal with the crisis in the West and Central Rand. Such a plan should both mitigate the environmental and health effects of mining and help the country meet its responsibilities under national and international human rights law.