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South Africa's disused coal mines could become sites of job creation – analysis

South Africa's abandoned coal mines – often regarded as environmental hazards – could have hidden potential to promote sustainable jobs, economic diversity and community resilience in the context of the Just Energy Transition (JET). This insight comes from an analysis by Nicola Wills, a PhD candidate in economics at the University of Cape Town (UCT).

In an article published in *Econ3x3*, Wills wrote that as the country moves away from coal toward cleaner energy sources, thousands of workers and their families face economic uncertainty. In 2019, the coal sector employed up to 108 000 workers, with nearly 66 000 of them based in Mpumalanga, a province where about 46 000 households depend on coal-related income. Half of the country's coal-fired power plants are expected to shut down by 2040, making it crucial to find new income in regions that used to depend on coal.

"The closure of coal mines must not mean the collapse of local economies. If we repurpose these sites strategically, we can transform them into platforms for jobs and development," said Wills.

The government is currently responsible for over 6 000 abandoned mines, including 379 coal sites. These sites pose serious risks: acid mine drainage, water pollution, land degradation, greenhouse gas emissions due to spontaneous combustion (notably when reopened by illegal miners), and safety concerns.

While information on the recent closure of established coal mines is available, Wills said this is not the case for abandoned mines, and the available data is outdated and provides no specific locations.

"Deficient rehabilitation and restoration of closed and abandoned coal mines presents risks, but also opportunities to create jobs. Supporting job creation and community resilience is very much in line with the JET," she said.

She added: "My analysis highlights sectors that support high-employment and low-carbon growth. Agriculture, environmental monitoring and other services, and industries linked to renewable energy exhibit strong employment benefits. These align with the Mpumalanga

Green Economy Development Plan, which aims to transition the province's economy toward renewable energy (including biomass), sustainable agriculture, and tourism by 2030."

Wills stated that mining contamination in Mpumalanga has been a major challenge for crop cultivation, but innovative rehabilitation techniques are proving that land can be restored for sustainable agriculture – an outcome once thought impossible.

The Mafube water reuse project produced maize yields nearly twice that of dryland crops, while the Wonderfontein wheat project used treated mine water to generate higher outputs than virgin soil, meeting all safety standards. Mpumalanga has also partnered with Coaltech and the Mpumalanga Green Cluster Agency to repurpose mining land for biofuels, industrial hemp and renewable energy.

The government has successfully rehabilitated about 55 abandoned mines, prioritising those that contained asbestos and emphasising safety while working to restore the land to its natural state. Wills stated that legislation mandates rehabilitated land to resemble its condition before mining. However, she suggested that a more effective approach would involve making the land economically viable for local communities.

She said the ongoing greenhouse gas emissions associated with these sites are not included in legislation. Research suggests that abandoned mine methane continues to be released into the atmosphere decades after mine closure. She said this is important to consider in the context of commitments to the Paris Climate Agreement.

According to Wills, many communities affected by mine closures lack skills and opportunities to adapt to an energy transition. "Workers in these mines are mostly semi-skilled, with around 40% in craft and related trades and 35% in plant and machine operations. Reskilling can assist in the transition from mining work to mine rehabilitation efforts, or even farming, but community buy-in is also critical."

The government has allocated R181.9 million for mine rehabilitation in the 2024/25 fiscal year. However, Wills stated that coal mines are not a priority, and obtaining mining closure certificates and accessing rehabilitation funds from the government can be very challenging. "Rehabilitation and restoration projects qualify for funding under the JET Investment Programme."

Wills concluded: "A just transition in South Africa's coal-mining communities hinges on pro-active policy interventions, strategic financing mechanisms and collaboration between government, industry and local communities. The challenge is to turn mining's destructive environmental past into an economic asset."

Note: This media release is based on a summarised version of an analysis published on Econ3x3, a publication hosted by SALDRU in UCT's School of Economics.

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