

# THE CIRCULAR ECONOMY: A REVIEW IN MILIEU OF THE SOUTH AFRICAN MINING INDUSTRY

## ABSTRACT

Mining, as a global economy, provides revenues and development to countries. It generally follows the Linear Economy (LE), which takes, makes and disposes of resources. However, mining wastes pose significant risk to both human health and the environment (Mehta, et al., 2018). One such waste, acid mine drainage (AMD), is considered one of the biggest environmental challenges facing the global mining industry (Hudson-Edwards, et al., 2011). With the increasing global water issues, the current economic model used in mining needs altering. A better option would be implementing Circular Economy (CE). The CE is “a regenerative system in which resource input and waste, emission, and energy leakage are minimised by slowing, closing, and narrowing material and energy loops” (Geissdoerfer, et al., 2017, p. 3 & 10). The main benefit of CE being reusing water, recycling water, enhancing renewable resources and eradicating toxic chemicals in waste water management.

The aim of this research report is to assess the uptake of CE in gold mining in South Africa and to see if this methodology is supported by South African Legislation. This is answered using a mixed methodology approach using qualitative and quantitative data and a case study looking at five gold mining companies in South Africa, namely AngloGold Ashanti, DRDGOOLD, Harmony, Gold Fields and Sibanye Stillwater.

Five main CE principles relevant to gold mining have been identified, namely: (1) Facilitating system effectiveness; (2) Preserving and enhancing renewable resources; (3) Optimising resource yields; (4) Collaboration and (5) Enhanced business models which entail transparent regulatory reporting. CE principles are mostly facilitated by South African legislation, with the exception of water regeneration, restorative systems and incentivised benefits to implement the CE.

Similarly, the case study, focusing on water management, indicate that the level of CE implementation in the gold mining sectors in South Africa has increased over the past 10-year period by all five mining houses. However, cross industry collaboration is lacking with miners not collaborating with other industries on the water issues faced by all industries. Positively an increase in environment data in later years can be seen by the companies studied. Thus, this

research looking at CE in gold mining waste water management could equally be relevant in other mining industries both in South Africa and globally.