Yesterday's World, Tomorrow's Landscape. Modelling Landscape Change in the Free State Goldfields, and Implications for the Development of Resource Regions

Ingrid Watson, Student number 514786

Abstract

The discovery and exploitation of a mineral deposit catalyses development that drives change and profoundly alters the landscape. Traditionally, the assessment of the impact of such developments focuses on a particular location at a specific time, having limited spatial and temporal scale, and so does not provide a full understanding of the consequences of mineral development. There is increasing awareness that the off-site and cumulative impacts of mining over its entire lifecycle are significant and leave resource regions ill-prepared for life after mining. Using the Free State goldfields as a case study, a landscape biography of this region was developed based on five key drivers of landscape change over four time periods between 1945 and 2018. This period covers the full lifespan of most gold mining operations in the region, from development, through production to closure.

The most significant drivers of landscape change in the Free State goldfield over its 73 year lifespan have been mining development, including the disposal of mine waste; urban and infrastructure development to support the mining enterprise; and legislation and political factors, which have played an important role in directing the form of landscape change. The original construction of the numerous mines and associated settlements fixed foundations which set the trajectory for future growth, initially allowing the area to thrive but, with mine closure and its social and economic consequences, have perpetuated unsustainable development to its current state of economic demise.

The three themes emerging from this research are that a landscape approach provides the big picture view and so is a useful tool to gain a comprehensive understanding of the whole system. Secondly, in resource regions mining does not act in isolation in driving landscape change, and thirdly, the consequence for resources regions are significant and existing measures to regulate these are inadequate. Based on these lessons, a model for managing resilient resource regions is developed.