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# Corporate reporting on solutions to wicked problems: Sustainable land management in the mining sector

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## ABSTRACT

Land degradation is a wicked problem for social–ecological systems, addressed through international policy by the United Nations Convention to Combat Desertification (UNCCD). The UNCCD is striving towards land degradation neutrality – maintenance or improvement of the condition of the land – whereby degradation is prevented and reversed through sustainable land management (SLM) and restoration. Land degradation neutrality, and therefore SLM, is relevant to all land-based sectors. This paper focuses on the mining sector. It explores how mining companies and mining sector stakeholders conceptualize SLM; identifies the drivers of their engagement in SLM; examines how mining companies operationalize existing guidelines to report on SLM; and evaluates the implications of the ways in which companies report on SLM in terms of the UNCCD's efforts in moving towards land degradation neutrality. Our methodological approach includes semi-structured interviews with key mining and SLM stakeholders and content analysis of company sustainability reports. Findings identify a range of interpretations of SLM and suggest that companies are engaging in SLM largely due to the need to reduce their costs and risks. We find a variety of good and poor reporting practices. Differences in both SLM discourses and the quality of reporting have important implications in terms of stakeholders' abilities to understand and evaluate corporate SLM performance, their engagement in the implementation of the UNCCD, and ultimately, the progress made towards land degradation neutrality. Our findings suggest that the currently dominant format of corporate sustainability reporting does not lend itself easily to context-specific, wicked problems such as SLM. Furthermore, there is a need for improved communication, data sharing and knowledge management between mining and other SLM stakeholders; a need to seek further synergistic opportunities for reporting; and that the context of reporting needs to be more clearly presented if reports are to be more useful and meaningful in outlining SLM.

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## 1. Introduction

Land degradation is a ‘wicked’ problem for integrated social-ecological systems. Wicked problems are highly challenging to address, largely due to incomplete, contradictory and dynamic requirements that make them both complex and multi-factored (Bruggemann et al., 2012); they also suffer a lack of clarity in terms of a route towards an optimal solution (Moeliono et al., 2014). Such ‘wickedness’ is inherent to land degradation due to the interactions between ecological, social, political, cultural and economic drivers of the problem, which operate over varying temporal and spatial scales (Reynolds et al., 2007); the multiple actors and stakeholders affected by and implicated in land degradation and its impacts (Schwilch et al., 2009); and the variety of research disciplines involved in the definition and identification of land degradation and the development and implementation of sustainable land management (SLM) solutions (Reed et al., 2011).

Policies play a key role in attempts to address wicked problems. The key international policy framework for addressing land degradation is the United Nations Convention to Combat Desertification (UNCCD), which entered into force in 1996 (Stringer, 2008). The UNCCD recognizes the importance of involving stakeholders including local communities, Non-Governmental Organizations (NGOs), civil society organizations, scientists and the private sector in efforts to move towards land degradation neutrality (Stringer et al., 2009). To date, the majority of analyses of progress in UNCCD implementation have focused on the agricultural sector. This has been justified in terms of pressing global challenges such as food, energy and water security and the cross-cutting role of land degradation therein (Thomas et al., 2012). However, mining is the fifth largest industry in the world and has largely been overlooked in terms of its potential to reorient land quality towards a more sustainable trajectory. The dominance of multi-national corporations (MNCs) in the mining sector means that this group is a key stakeholder in the maintenance of land quality into the future, especially as land is affected by mining throughout exploration, construction, operation, closure and post-closure stages of a mine’s lifecycle (ICMM, 2011).

The extraction aspects of mining cause the largest environmental and social impacts. In general, major environmental issues relating to the mining sector include the depletion of (mineral, land and other) resources; biodiversity loss; the need for land rehabilitation; product toxicity; water use, effluents and leachate management; emissions to air, liquid effluents and solid waste; energy use and contributions to global warming; and nuisance (Azapagic, 2004; Miranda et al., 2012). Due to the presence of linkages and feedbacks, each of these environmental impacts can negatively affect the social (human) aspects of the system (Folke et al., 2002), highlighting the wicked character of the land degradation challenge.

While the UNCCD is striving towards land degradation neutrality, mining companies have been growing in their environmental consciousness, driven by national legislation and company commitments to Corporate Social Responsibility (CSR). In this context, corporate sustainability reporting is emerging as a mainstream practice, particularly among large MNCs (Kolk, 2010; KPMG, 2011). In essence, corporate

sustainability reports should enable a company’s stakeholders to benchmark and compare sustainability performance whilst allowing the company to demonstrate how it is meeting the sustainability challenges it faces (GRI, 2011). At the same time, it is recognized that using more sustainable company practices can offer a competitive advantage in the corporate world, while for mineral-rich developing countries in particular, companies are the economic stakeholders that possess and can utilize the capacity, technologies and other resources to ensure more sustainable extraction activities. Many regulatory bodies and international organizations are involved in developing guidelines designed to enable companies to report. Some of the most commonly used voluntary guidelines are those provided by the Global Reporting Initiative (GRI).

The GRI reporting guidelines encompass a range of aspects that are relevant to SLM. As such, companies are expected to report on their SLM-related performance as part of their general sustainability disclosures. However, given the complex, context-specific and inter-related nature of land degradation, reporting on SLM is not trivial. For example, it is very difficult to quantify sustainability impacts and disaggregate them to the level of the individual actor (Gray and Milne, 2002; Gray, 2010) or in this case, mine, particularly when large MNCs operate in a range of different contexts. The context-specific nature of SLM also raises questions regarding the ability of stakeholders to compare and benchmark corporate performance on the basis of the information that is reported.

The research literature on corporate reporting on wicked problems like land degradation and steps taken towards SLM can be described as nascent, concentrating largely on reporting in relation to biodiversity in just a few academic articles (Jones and Solomon, 2013; Boiral, 2014). The mining sector has been neglected within efforts to move towards SLM and land degradation neutrality, leaving an important knowledge gap regarding how mining companies and stakeholders understand SLM, how they adopt SLM and how they communicate their SLM practices. This paper addresses this gap by answering the following questions:

- (1) How do mining companies and mining sector stakeholders conceptualize SLM?
- (2) What motivates mining companies to engage in SLM?
- (3) How do mining companies operationalize existing reporting guidelines to report on SLM?

Our findings are discussed in terms of their implications for progressing towards a land degradation neutral world.

## 2. Theoretical background

### 2.1. Sustainable land management in the mining sector

SLM as a response to land degradation is defined in different ways by different groups. According to the UNCCD (UNCCD, 2011, p. 4), SLM constitutes “land-use practices that ensure the land, water, and vegetation adequately support land-based production systems for both current and future generations” (UNCCD, 2011, p. 6) and aims “to enhance the economic and social well-being of affected communities, sustain ecosystem

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