A path towards sustainability for the Nordic mining industry

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A B S T R A C T
The mining industry has a major impact on society - from an economic, environmental and social perspective and due to a vast number of criteria. Which criteria should be given priority depends on where the mining operations take place. This paper’s focus on the Nordic mining industry is partly due to the positive economic trend that the industry is currently experiencing and partly because very little research has been conducted on how the European mining industry addresses sustainability. The purpose of this study is therefore to examine the Nordic mining industry’s sustainability practices and to develop guidelines for such efforts.

The research methods used in the study include a literature review, a content analysis of sustainability reports, a review of existing sustainability initiatives, guidelines and tools, a stakeholder survey and interviews with mining company officials. Based on the findings, sustainability criteria guidelines for the Nordic mining industry are suggested in the areas of corporate governance, fair operating practices, economic aspects, human rights, labour practices, society and the environment. The content of the guidelines is discussed in the light of the sustainability practices performed by the studied mining companies.

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1. Introduction

Strong economic growth and the more sophisticated requirements of the developed world have led to an increased demand for minerals and metals (ICMM, 2013). The last two decades have been somewhat dramatic for the Nordic mining industry (Kurkkio et al., 2013). For example, Sweden is currently one of the EU's leading producers of ores and metals and in 2011 investments in exploration reached a record level (SGU, 2013). In the light of this development, studying the mining industry from a Nordic perspective enables us to learn important lessons for the future.

Although mining is a primary source of important metals and minerals, the use of which ranges from traditional construction to green technology, it also has negative associations and consequences. Impacts range from the geographic and cultural displacement of indigenous communities to contamination of water, air and land with toxic by-products of extraction and processing that have not been sufficiently well contained and/or treated (Moran et al., 2014). In addition, the markets are cyclical in nature, where dips and booms create challenges for companies and communities alike. Mining activities are often welcomed locally as a source of new jobs and for providing positive development opportunities. In other cases they have sparked conflicts, particularly in regions where mines compete for land with other business sectors and stakeholders. Local communities often experience social problems as a result of mining activities (Hermanus, 2007). Further, the accident and ill-health record of the global mining industry makes it one of the most hazardous sectors, particularly with regard to the dust and noise associated with rock blasting, artificial air and light supplies, harmful gases and ergonomic hazards (Jenkins, 2004).

The mining industry has experienced increased stakeholder pressure over the last twenty years as a result of its impact on the environment and society (Kapelus, 2002). Major international organizations, such as the United Nations (UN), the International Labour Organization (ILO), the World Bank and the Organization for Economic Co-operation and Development (OECD), promote and monitor sustainability initiatives (Benn and Bolton, 2011). As a consequence, the mining industry has engaged in the sustainability debate and begun to formulate strategies that address the challenge of sustainable development (Azapagic, 2004). The difficulties lie in trying to apply the principles of sustainable development in
practice (Azapagic and Perdan, 2000).

Different approaches have been suggested in order to define sustainability criteria and indicators for the industry (Azapagic and Perdan, 2000; Auty and Brown, 1997; Clayton and Radcliff, 1996), some of which specifically focus on mining (Lodhia and Martin, 2014; Hilson and Basu, 2009; Worrall et al., 2009; Azapagic, 2004). However, none of these approaches have a specific Nordic perspective. Even though sustainability is on the global mining agenda, the criteria that should be prioritized can differ from one country to another (Idowu and Leal Filho, 2009).

The mining industry has an economic, social and environmental impact on society and the criteria that needs to be given priority depends on where the operations are located. The Nordic mining industry has been chosen due to the positive economic trend that the industry is currently experiencing and because very little research has been conducted on how the European mining industry tackles the sustainability challenge (Ranängen and Zobel, 2014a). The purpose of this study is thus to explore the Nordic mining industry's sustainability practices and develop sustainability guidelines.

The introduction is followed by chapter 2 which gives a description of the methods used in the study. This is followed by the presentation of the findings in chapter 3. Finally, in chapter 4 the sustainability criteria guidelines for the Nordic mining industry are presented and discussed in the light of the industry's sustainability practices.

2. Methods

The methods used in the study are now going to be described and the results are presented in chapter 3.

2.1. Literature review

A literature review helps us to understand a topic and to ascertain what has already been discovered about it, how it has been researched and what the key issues are (Hart, 1998). In this study, the review was conducted in order to acquire an overview of previous research on the sustainability criteria and indicators in the mining industry. A search was performed in the autumn 2015 in the Google Scholar, Scopus and Web of Science databases on the titles of articles, abstracts and keywords. The following search strings were used:

*Sustainability criteria* AND mining OR metal OR extractive
*Sustainable indicator* AND mining OR metal OR extractive
*Sustainable development indicator* AND mining OR metal OR extractive
*Sustainable development criteria* AND mining OR metal OR extractive

A list of literature titles and abstracts was printed out from each search/database and irrelevant literature and duplicates were discarded. Examples of irrelevant literature are when the focus is on forestry or gas. Some of the articles were found by skimming through reference lists in the already identified articles. Comparing the reference lists in the relevant articles made it easier to identify frequently cited and important papers in the subject area. Searching for quotations and important papers in the Web of Science database was particularly successful. This also enabled us to search for articles chronologically. The entire procedure resulted in 23 scientific papers. The sustainability criteria and indicators studied in the papers were listed and sorted into core subjects in an excel-sheet. The results were then summarized according to the number of times each criterion was found in previous research.

2.2. Sustainability reports

A list of mining companies operating in the Nordic countries was compiled and seven of these companies had produced and published sustainability reports (see Table 1, below). In the first instance, sustainability reports published in 2014 were considered for this study. In two cases the reports for 2013 were used instead, because reports for 2014 were not available.

The content of the sustainability reports was studied in order to find references to sustainability initiatives, guidelines or tools (see Table 4). The software application Leximancer was used for a qualitative text analysis to determine the presence of words or concepts in the reports. The analysis was conducted in order to identify the subjects and key sustainability criteria for each subject.

2.3. Review of existing sustainability initiatives

A review of the identified sustainability initiatives, guidelines and tools, presented in the left-hand column in Table 4, was undertaken in order to identify the prioritized sustainability subjects and criteria.

2.4. Stakeholder surveys

In March 2016, an online questionnaire was sent by email to a total of 230 mining stakeholders in Finland, Norway and Sweden. The case study by Ranängen (2015) was used to identify the most relevant stakeholder groups in the Nordic countries, to which the survey was then sent. The case study identified Sami communities, politicians, authorities, employees, capital markets, neighbours, owners, business partners, the media and public opinion makers as relevant stakeholder groups. Politicians and authorities included county administrative boards, municipalities, county councils, the Mining Inspectorate of Sweden, the Swedish Environmental Protection Agency, the Sami Parliament, the Geological Survey of Finland, the Finnish Safety and Chemicals Agency, the Centre for Economic Development, Transport and the Environment in Finland, regional state administrative agencies in Finland, regional councils (Finland), the Ministry of Trade, Industry and Fisheries in Norway, the Geological Survey of Norway and the Norwegian Environment Agency. Employees included union representatives. Capital markets consisted of international banks and investors and ethical funds. Neighbours included local folklore societies, athletic clubs, recreation, cultural, hunting and fishing associations etc. Business partners were both suppliers and customers. Public opinion makers included business associations, NGOs and labour unions.

The questionnaire was translated into each country’s native language. The choice of an online survey was regarded as the best option due to the project’s time frame and for easy access. The respondents were asked to circle the number that best matched their opinion for the various sustainability criteria on a scale of 1–5, where 1 symbolized ‘not important at all’ and 5 ‘very important’.

2.5. Interviews

Officials at the mining companies that had published sustainability reports were interviewed. The assumption was that these companies were more proactive and had the most comprehensive and implemented sustainability work. An interview guide was constructed based on the results of the literature review and the analysis of the sustainability reports. Semi-structured interviews and a group interview were performed with people who were responsible for the companies’ sustainability management (see Table 2). The interviews were either held at the company’s head office, or by telephone. In one case the respondent preferred to
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دانلود فوری مقاله پس از پرداخت آنلاین
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