



## Review Article

## Sustainable livelihoods and indicators for regional development in mining economies

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## ARTICLE INFO

## Article history:

Received 4 September 2014

Received in revised form 6 December 2014

Available online 9 January 2015

## Keywords:

Mining  
Regional development  
Indicators  
Sustainable livelihoods

## ABSTRACT

In recent years, there has been growing interest in identifying robust indicators which demonstrate the links between mining and development. This builds on an extensive body of work in the broad field of rural development, and aims to capture the extent to which mining is contributing to changes in economic, socio-cultural, health, political and environmental conditions. While these indicators are contested on both conceptual and methodological grounds, we argue in this paper that the sustainable livelihoods (SL) framework might offer a more robust means of understanding the interplay between mining and development. The paper traces the emergence of this framework and considers how it might be situated in the context of existing 'resource studies' literature, before proposing methodological and conceptual alternatives for understanding the links between mining and development.

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## 1. Introduction

Over the past two decades or so, an influx of foreign investment has facilitated unprecedented increases in mineral production throughout sub-Saharan Africa, Asia and Latin America (Hilson and Banchirigah, 2009). Primary examples include: the marked increase in copper production in Zambia; the sharp increases in gold and bauxite mine production witness in Ghana since the mid-1980s; and the rapid expansion of gold mining in Peru (Aryee, 2001; Bury, 2004; Ruffini, 2006). More recently, Rwanda's mineral industry has been producing gold ores and concentrates of columbium, tantalum, tin and tungsten for export (Yager, 2003), and Indonesia's coal output has increased rapidly (Amijaya and Littke, 2005). However, the development outcomes achieved by foreign investment in extractive industries in developing countries continue to be a matter of debate (Emel and Huber, 2008, p. 1393; Blowfield and Frynas, 2005). The negative effects that oil, gas, and mineral dependence have on long-term economic stability, social welfare and the environment has been the subject of considerable attention in the academic literature (Pegg, 2006; Atkinson and Hamilton, 2003; Gylfason, 2001; Sachs and Warner, 1995; Auty, 1993; Gelb, 1988; Nankani, 1979). But more recent empirical studies have pointed to more positive relationships between natural resource abundance, and economic growth and welfare (Sarmidi et al., 2013; Boyce and Emery, 2011; Aubynn, 2009; Brunnschweiler, 2008; Aroca, 2001).

These debates sit in parallel with two important changes in the global development landscape. The first is a significant paradigm shift beyond narrow economic definitions of development. The second and related change is an emerging recognition from within the mining industry of its need to demonstrate responsible social and environmental practice in their operational contexts. Inherent within Corporate Social Responsibility (CSR) and community development strategies is the requirement to produce evidence with regard to the various development impacts of mining at multiple spatial scales.

However, in the absence of a consistent approach to the selection of indicators based on clearly defined and conceptually robust notions of 'development', it is difficult to determine to what extent inconsistencies in conclusions about the effects of mining on developing countries are due to variations in objects and methods of 'measurement', and which represent substantive differences in development trajectories. Further, many of the 'conventional wisdoms' regarding the relationship between resource extraction and development, both positive and negative perspectives, are based on assumptions that have not always been subject to sufficient empirical testing.

There is also little recognition of the cumulative long-term implications of mining on regional development that take account of what might be referred to as 'second round' impacts – that is, the broader impacts of mining on local economies, social systems, services and infrastructure, and institutions. A major challenge, of course, is that reliable indicators of development are often limited by the availability and cost of collecting and analysing data. Thus, there is a pressing need to address the conceptual, methodological and practical constraints around understanding the impact of mining on development.

In this paper, we employ the sustainable livelihoods (SL) framework to evaluate existing evidence and identify knowledge gaps regarding the relationship between mining and the five 'capitals' posited as critical apparatuses of development within the SL approach. We begin by tracing the emergence of the SL approach as a framework for making sense of and measuring development. We then synthesise the major positive and negative impacts of mining as identified by key studies and examples in the literature, categorising them under each of the five capitals. In so doing, we

advance three central observations with regard to the existing literature. First, most of the existing analyses of mining and development in developing countries are undertaken predominantly at the national scale, particularly with respect to works focusing on the 'resource curse'. There is very little evidence regarding possible sub-national outcome differentials, or the local and regional effects of mining. Second, there is a range of contradictory narratives regarding the relationship between mining and development in relation to each of the five capital domains. The existing research evidence does not support simplistic casual assertions and assumptions about the role of mining in developing world contexts. Finally, the question of who defines 'development' opens up an important emerging space of scholarly inquiry with regard to mining in developing countries. After drawing out the implications of these observations, we conclude by proposing methodological and conceptual advances to building a more robust and comparative evidence base with regard to mining and development at local and regional scales in developing world contexts.

While the focus of this article is on the 'five capitals' in the SL framework, we acknowledge that other elements of the framework, including the vulnerability context, transforming processes and structures, livelihood strategies and outcomes are each worth further attention in the mining context in their own regard. However, as the central pivot of the framework, it is anticipated that applied research on the five capitals in any particular context would necessarily take into account how each are impacted by and impact upon these other elements of the SL approach. We also acknowledge that since the 1990s – when the SL framework first emerged and came into prominence – there has been a proliferation of alternative views of development studies and practice, one of which is post-development critique. In this context, a number of critiques of the SL framework have emerged, and donor and development agencies that initially embraced the approach no longer consider it to be their primary emphasis.

However, we argue that the critiques of the SL framework to date do not preclude a useful engagement of the framework in the resource context for several reasons, as we will elaborate further in this paper. These include (i) the SL framework may be alternatively construed as a set of principles, an analytical framework, and a development objective and is thereby flexible enough to be combined with other constructs and paradigms; (ii) the evidence-based approach of the SL framework could be put to good use in testing the array of theoretical assumptions about the positive and negative impacts of mining; (iii) the ability of the SL framework to focus in at the micro level is a strength that may further enhance analysis of the impacts of the mining sector on development which has tended to focus at the macro level; (iv) the SL framework can be used not only to organise information, but also to help its users to restructure information and knowledge from multiple perspectives – another missing thread in resource literature; and (v) the emphasis on participatory methods promoted by the SL framework may also contribute to better decisions in both public policy and private investment sectors of resource economies.

Building on our use of the SL framework to understand how impacts of mining may be perceived negatively and positively depending on their tendency to enhance or deplete one of more of the 'five capitals' at various scales, this paper also aims to demonstrate that the utility of the SL framework extends beyond its genesis as a simplistic generic framework which dominated applied development during the 1990s. Its simplicity, flexibility, potential for application at macro and micro scales, evidenced-based, people-centred, and participatory methodology makes it a 'good fit' for developing a coherent conceptual and practical framework for selecting indicators to concretely measure the interaction between mining and development at various scales.

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