The Extractive Industries and Society 2 (2015) 162–176

Contents lists available at ScienceDirect

The Extractive Industries and Society

journal homepage: www.elsevier.com/locate/exis

Review Article

Extractive industries and poverty: A review of recent findings and linkage mechanisms

Jonathan Gamu [a], Philippe Le Billon [a,*], Samuel Spiegel [b]

[a] Liu Institute for Global Issues, University of British Columbia, Canada
[b] Centre of African Studies, University of Edinburgh, United Kingdom

ARTICLE INFO

Article history:
Received 23 May 2014
Received in revised form 31 October 2014
Available online 9 December 2014

Keywords:
Extractive industries
Poverty
Development
Mining
Resource curse

ABSTRACT

This article surveys fifty-two empirical studies on relationships between extractive industries and poverty, addressing both poverty impacts and possible linkage mechanisms. Distinguishing these studies by mode of resource extraction, we find industrial mining to be more frequently associated with poverty exacerbation, and artisanal mining with poverty reduction. Poverty exacerbation findings are more pronounced in cross-national statistical studies and ethnographic local case studies, especially when relative deprivation and longer-term impacts are taken into account; while sub-national census-based studies tend to show lower poverty levels in areas with extractive sector activities. A review of thirteen specific linkages between extractive industries and poverty highlights the importance of governance institutions and the limited effects of Corporate Social Responsibility activities. Methodologically, our survey points to the dominance of industrial mining-related data in cross-national and sub-national studies and the overlooked effects of artisanal and small-scale mining on poverty reduction at analytical scales larger than community-level. Such findings call for integrated studies assessing effects on poverty at various scales and attending to the specificities of mining-related livelihoods. Nested mixed-methods including place-based ethnographic observation, longitudinal surveys, as well as socioeconomic and political analysis across multiple scales are needed to provide more robust contextual understandings of the relationships between extractive sectors and poverty.

Contents

1. Introduction . . . 163
2. Extractive industries and poverty . . . 164
 2.1. Analytical framework . . . 164
  2.1.1. Mode of resource extraction: industrial versus artisanal mining . . . 164
  2.1.2. Population scales for examining poverty: from national to local-level effects . . . 164
  2.1.3. Research methods: quantitative and qualitative approaches . . . 165
 2.2. Overview of studies and results . . . 165
3. Theory and evidence: accounting for causal linkages . . . 165
 3.1. Poverty reduction . . . 167
  3.1.1. Catalyst for growth . . . 167
  3.1.2. Fiscal transfers . . . 167
  3.1.3. Direct employment . . . 168
  3.1.4. Upstream and downstream linkages . . . 169
  3.1.5. Private investment in public goods . . . 169
  3.1.6. CSR initiatives . . . 170
 3.2. Poverty exacerbation . . . 170
  3.2.1. Economic underperformance . . . 171
  3.2.2. Inter-sectoral mobility . . . 171

* Corresponding author. Tel.: +1 6048229935.
E-mail address: lebillon@geog.ubc.ca (P. Le Billon).

http://dx.doi.org/10.1016/j.exis.2014.11.001
2214-790X/

3.2.3. Exacerbation of inequality . . . 171
3.2.4. Employment volatility . . . 172
3.2.5. Economic enclaves . . . 172
3.2.6. Rent seeking and corruption . . . 172
3.2.7. Environmental and social impacts . . . 173
4. Concluding remarks . . . 174
Acknowledgements . . . 174
References . . . 174

1. Introduction

The developmental record of resource-rich countries has received much attention since the oil boom of the 1970s. In theory, mineral extraction, including oil and gas, should contribute to development by increasing employment, economic growth and public services, and thus reduce poverty. Yet many empirical studies point to the challenge of translating resource wealth and resource-led growth into poverty reduction, stressing the "ambiguity" in the relationship between extractive industries and "development" (Bebbington et al., 2008). This article reviews empirical studies that specifically examine the relationship between extractive industries and poverty as well as the particular linkages articulated in these studies in order to gain further insight into this ambiguity. Our findings underscore how divergences between methodological orientations in studying these linkages matter, and we argue that interdisciplinary mixed methods approaches that take into account the full range of socioeconomic costs and benefits as well as power dynamics at multiple scales are vital to understanding the relationship between extractive industries and poverty.

Analytic simplifications abound in the literature addressing the poverty impacts of extractive industries. Studies of extractive sectors tend to follow one of two main paradigms. The dominant paradigm related to large-scale mining extols the potential for extractive sectors to reduce poverty. Since the onset of the recent commodity 'super-cycle' driven by 'emerging economies', many proponents of extraction-led development have renewed arguments that the poverty reduction potential of extractive sectors can be harnessed (ICMM, 2013). The World Bank Group supports extraction-led development in low- and middle-income countries on the grounds that large-scale industrial mining can contribute both directly and indirectly to poverty reduction (Weber-Fahr et al., 2001; Weber-Fahr, 2002). In addition to its contribution to aggregate growth, the ICMM (2013: 5) argues that extractive industries have important regional and local level effects, noting that mining regions in Chile, Ghana, and Brazil "[h]ave enjoyed stronger poverty reduction and social development performance than non-mining areas." Extractive companies highlight the potential poverty-reducing effects of their activities through employment, local procurement, physical infrastructure and the provision of public goods such as health care and education as well as skills training through their Corporate Social Responsibility (CSR) programmes (Dashwood, 2012). Many proponents within 'international development' do stress the challenges of soundly governing extractive industries, yet remain confident about the possibility of positive contributions (Pedro, 2006; Collier, 2010; APP, 2013).

While extractive companies, industry associations, national governments and many international development agencies present arguments regarding the potential positive contributions from extractive industries to poverty reduction, many other voices have empirically challenged the prevailing optimism. For many critics of extractive industries, the past record of mismanagement, corruption, pollution and exploitative terms of commercial relations suggest that new resource booms are unlikely to benefit the poor, absent major changes in power relations between governments, companies and communities at both domestic and international levels (Gary and Karl, 2003). Such perspectives echo earlier studies in rural sociology of persistent poverty within natural resource-dependent areas, which point to "the shift from labour to capital-intensive resource extraction, profit squeezes, and increased capital mobility ... [as well as] internal colonialism such as unequal exchange, the clash between traditional and secular cultures, and the control of public agencies by powerful private interests" (Peluso et al., 1994: 23; Freudenburg, 1992). This more critical paradigm related to large-scale mining often engages early studies on rentier states (Mabro, 1969; Mahdavy, 1970; Yates, 1996; Karl, 1997) and is frequently articulated around the concept of *resource curse*.[1] Resource curse scholarship argues (with variations) that resource-rich and/or resource-dependent countries generally experience relative economic and institutional underperformance as a result of a series of mechanisms including greater exposure to economic shocks, currency overvaluation, higher levels of corruption, lower levels of democratization, higher likelihood of armed conflict, and a consolidation of patriarchy (Auty, 1994; Arezki and Van der Ploeg, 2011; Ross, 2012; for a critique of common framings of the 'resource curse,' see Di John, 2011; Boschini, 2013). Whereas some early econometric studies of the 'resource curse' claimed unconditional negative impacts on economic growth (Sachs and Warner, 1995), more recent ones demonstrate the crucial role of institutions (Bulte et al., 2005), and emphasize the difficulties of managing large and volatile revenues even with relatively sound governance institutions (Ross, 2012).

While the 'resource curse' paradigm mostly questions the macro-level developmental contribution of large-scale mining and oil and gas industries, another paradigm critical of extractive industries is one that emphasizes negative micro-level impacts of artisanal and small-scale mining (ASM) on rural communities – such as health, environmental and work safety hazards, high inefficiencies and low returns, labour diversion – and negative impacts on public finances and political order due to the weak 'tax-handle' (difficulty of taxation) provided by a mostly 'informal' sector (Davies, 2009; Snyder and Bhavnani, 2005). There is, however, a growing counter-perspective to this negative portrayal, namely one that focuses on ASM's potential for poverty alleviation – a perspective, as Hilson and McQuilken (2014) demonstrate in a recent review, that is often undervalued within global and national development agendas and marginalized relative to industrial mining.

If the 'curse or blessing' of resource wealth is intensely debated, relatively few studies have systematically reviewed the linkages between extractive industries and poverty. Among these, Labonne (2002: 69) concludes that "mining broadly contributes to poverty reduction", whereas Pegg (2006: 376) suggests that "mining is more likely to lead to poverty exacerbation than it is to poverty reduction." As discussed below, settling this debate is difficult. Despite the many articles on the resource curse, very few mobilize

[1] The term curse seems to have been first used academically in relation to resource-led development by Thorp and Bertram (1978), and most prominently by Gelb (1988), although the term 'resource curse' first appears as a metonym in Auty (1994).

large-N methods (analyzing patterns in a large number of cases, generally using large databases) to *specifically* assess possible effects on poverty levels. Ross (2001: 4; 2003) observes that "oil and mineral dependence are strongly associated with unusually bad conditions for the poor", and that "higher levels of mineral dependence [are] strongly correlated with higher poverty rates." Assessing the impact of extraction-led growth, rather than extractive sector dependence, Davis and Cordano (2013) find no evidence that such growth is either 'pro-poor' or 'anti-poor'. Furthermore, large-N studies relying on limited cross-national data are often open to critiques of reductionism, while the more nuanced case study literature is sometimes dismissed for its anecdotal character. As discussed below, these contrasting perspectives and the absence of consensus on the poverty reduction or exacerbation effects of extractive sectors are not surprising given the diversity of socio-economic and institutional settings in which they operate. Furthermore, studies vary in the definitions and indicators used to assess poverty, in the differences in time periods covered in relation to commodity prices and investment cycles, as well as in the array of scholarly disciplines and methods used to investigate this topic.

In this article, we review findings from fifty-two empirical studies of the effects of extractive industries on poverty (see below for selection process). We first discuss definitions of poverty. We then outline our analytical framework, distinguishing between analytical scales, empirical methods, and modes of resource extraction. We then briefly present the studies surveyed and their general findings according to their scale of analysis before examining the various mechanisms purported to link extractive industries to poverty reduction or exacerbation. We conclude with a discussion of the main empirical findings and methodological suggestions for further research.

2. Extractive industries and poverty

Poverty can be conceptualized as a multidimensional phenomenon characterized by causal complexity and diverse outcomes (Banerjee et al., 2006). The World Bank (2001) provides a broad conceptualization comprised of four components: (1) material deprivation, (2) lack of access to education and health services, (3) vulnerability and exposure to risk, and (4) voicelessness and powerlessness. Taken together, these elements are meant to capture the range of social, economic, political, human health, and environmental dimensions through which poverty can be analyzed empirically. As Pegg (2006) notes, even though the World Bank's influences on extractive sector governance have been widely disputed in practice, the World Bank's conceptual framework provides scholars with useful tools for understanding relationships between extractive industries and poverty – in theory. Yet it is not without shortcomings. For example, underlying drivers of socio-economic *inequality* are not explicitly included. While growth may reduce material deprivation through an absolute increase in household incomes, the gap between rich and poor may continue to widen. Inequality – and more generally relative deprivation – are thus important dimensions of poverty as they bear both on impoverished peoples' *self-perceptions* of social status and power (or lack thereof) and their *material ability* to exercise voice. Not all studies explicitly follow the World Bank's conceptualization; some do include human health and/or environmental dimensions while others exclusively consider its economic dimensions. Attention to the multidimensionality of poverty is important when surveying the empirical literature as it can help analysts better comprehend the diverse causal pathways and population scales at which extractive industries may affect society.

2.1. Analytical framework

Our survey rests on an analytical framework including the modes of resource extraction, the scales at which the effects on poverty are observed, and the research methods employed by scholars. We review each of these dimensions in turn.

2.1.1. Mode of resource extraction: industrial versus artisanal mining

Extractive industries can be disaggregated into two broad categories based on the scale and methods of resource extraction: industrial mining (IM) and artisanal and small-scale mining (ASM). The former is a capital-intensive mode of resource exploitation requiring relatively small amounts of high-skilled and semi-skilled labour to extract, transport, and process minerals en masse. Conversely, ASM is a low-tech, low-capital, and labour-intensive mode of resource exploitation, generally of relatively high value minerals such as alluvial gold, diamonds or cassiterite. Whereas IM generally involves wealthy investors driven by prospects of long-term returns, ASM is often (though not always) poverty-driven spurred by prospects of short-tem returns or be part of long-term livelihood diversification strategies (Banchirigah and Hilson, 2010; Siegel and Veiga, 2010; Maconachie, 2011; Hilson, 2012; Hilson et al., 2013; Spiegel, 2014a,b). While ASM can potentially lift people out of poverty, it can also reflect a situation of prevailing poverty, thereby requiring attention to the circumstances of ASM practices and net effects on mining communities over time (Hilson, 2005).

As modes of natural resource exploitation, IM and ASM are represented for purposes of this study as distinct *independent variables* that can affect poverty via unique processes operating at different population scales. Yet, it is important to note that there are not only dialectical relationships between these variables and social processes determining poverty, but that interaction effects can exist between the two types of mining, which may also affect poverty outcomes. For example, ASM activities sometimes precede large-scale mining projects or emerge around the peripheries of IM activity areas (Luning, 2014). This frequently generates tensions as large-scale companies, often backed by the coercive power of the state, seek to assert their tenure, and secure profits by preventing 'encroachments' by artisanal miners and restricting access by local communities (Hilson and Yakovleva, 2007; Spiegel, 2015). When poorly managed, such tensions can exacerbate poverty, most notably through its impact on artisanal miners losing their livelihood, but also – at least from a macro-level perspective – from large-scale mine suspension or closure if tensions escalate to the point of violent conflict with local communities (Franks et al., 2014).

2.1.2. Population scales for examining poverty: from national to local-level effects

In addition to its multidimensionality, poverty is also a multi-level phenomenon, meaning that the manifestations and possible causal mechanisms can be observed differently at national, regional and local scales. These, in turn, often reflect different epistemologies of poverty and the search for appropriate methods in poverty research (for a wider discussion, see Tooze and Murphy, 1996; Shaffer, 2013). The manner in which scholars operationalize – or 'measure' – poverty depends largely upon the scale or level under consideration. Most metrics compiled by national governments and international organizations – such as the $1.25/day headcount, Gini coefficient, infant mortality, and life expectancy – are generally made available at an aggregated national level, though sub-national data can sometimes be accessed. Other metrics – such as changes to household livelihood activities, rural access to clean water/wells, or perceptions of risk and vulnerability amongst affected communities – are generally more spatially circumscribed or discrete, enabling scholars to capture regional and local effects.

The various mechanisms linking extractive industries and poverty identified in the literature also occur at diverse population scales (e.g. from village to national levels) and can operate simultaneously in support of or against one another. For example, access to wages is mostly limited to mining communities, while fiscal revenues are more broadly distributed among regional and national populations. Pollution can affect certain populations at the regional level, while inflation can be acutely felt only in proximity to mining areas or at the national level (depending on the size of revenue generated). Extractive industries may have minimal positive impacts on national income distribution, but positive impacts can, at least temporarily, accrue at a local level through health and education programmes in host communities, and on a regional scale through infrastructure development if these can help diversify the economy. Attentiveness to scalar effects can help scholars better comprehend the complex linkages between extractive industries and poverty.

2.1.3. Research methods: quantitative and qualitative approaches

Scholars use various research methods to study the effects of extractive industries on poverty. The decision to deploy quantitative or qualitative methods is largely guided by specific research questions and the availability of data; nevertheless, each has distinct advantages and limitations. Statistical methods, such as multivariate regression analyses, rely on large samples of relatively limited variables (i.e. large-N data) and, if conducted with enough nuanced attention to the diverse costs and benefits, can allow researchers to (at least theoretically) estimate the general causal effects of extractive industries on poverty outcomes across a broad universe of cases (generally cross-nationally and sub-nationally). Such methods, moreover, enable researchers to (again at least theoretically) control for possible confounding factors. However, while they can allow researchers to draw generalizable conclusions, they are limited in their ability to empirically test theorized mechanisms linking cause and effect. Furthermore, they often overlook or simplify important contextual factors mediating the relationship between natural resources and poverty outcomes.

Qualitative research methods, on the other hand, such as individual or comparative case studies (i.e. small-N studies), allow researchers to better grapple with the issue of causal complexity and the need for nuanced contextualization, thereby integrating a large number of 'variables' and diverse perspectives. The conclusions of small-N research designs, however, may be limited to a smaller universe of cases and may not be generalizable beyond the particular country, region or district under consideration. As we observe, a significant methodological division exists within the literature. Large-N statistical studies tend to focus on the socio-economic effects of mostly IM-related indicators cross-nationally and nationally (often unintentionally overlooking ASM dimensions that are harder to measure), while small-N qualitative studies tend to focus on the socio-economic effects of ASM sub-nationally. As we argue, scholars interested in studying the effects of extractive industries on poverty can harness the potential of each by employing mixed-methods research designs to understand general relationships and specific causal linkages.

2.2. Overview of studies and results

This meta-study of extractive industries and poverty covers 52 studies conducted over the past fifteen years. Studies were identified through the Web of Science database using a combination of the following keywords: poverty, mining, oil, petroleum, extractive sectors, extractive industries, and artisanal mining. These peer-reviewed articles were then selected for their use of empirical evidence in assessing relationships between extractive industries and poverty. Studies that qualified for inclusion ranged from econometric studies of socio-economic indicators to field-based focus groups and individual interviews. The selected studies included those with data covering the 1956–2012 period, ranging from cross-national datasets from 194 countries down to ethnographic material from specific mining sites. Thirty-six studies dealt mostly with large-scale industrial mining (or at least indicators that mostly reflect IM activities and revenues), thirteen covered ASM, and three covered both. Ten studies used cross-national data, 15 sub-national data, and 27 used individual or comparative case studies at the local or regional level. We briefly outline the findings and characteristics of these studies according first to the scale of their sample and method, and then in chronological order in Table 1a, Table 1b, Table 1c. While the results of these studies were often nuanced, for the sake of this analysis, findings are reported as "negative" if the study generally associated extractive activities with higher poverty levels or an exacerbation of poverty, and "positive" otherwise. Studies varied in their quality and rigour; some studies specified intervening variables or qualifying factors, while others did not. When short-term and long-term effects varied, we focused upon long-term effects.

Overall, this set of studies demonstrates a diversity of mechanisms and, not surprisingly, a lack of uniformity regarding the perceived influences of extractive industries on poverty. A majority of the cross-national studies in our sample found negative – or poverty aggravation – effects, while evidence from sub-national panels was predominantly positive (see Table 2a). Most studies of ASM in our sample found positive effects, whereas IM studies generally suggested negative effects (see Table 2b). Several studies confirmed that inequality often increases, either in terms of income groups or in other dimensions of poverty such as deteriorating health and resource access.

3. Theory and evidence: accounting for causal linkages

In this section we review the mechanisms posited to explain the causal effects of extractive industries on poverty, along with empirical findings. Following our analytical framework, the

Table 1a
Cross-national studies.

Authors	Findings	Period	Cases	Mode of extraction
Gylfason (2001)	Negative, lower educational achievements	1965–1998	85 countries	IM (oil, gas, and metals)
Ross (2001)	Negative	1987–1997	194 countries	IM (oil, gas, and metals)
Bulte et al. (2005)	Negative, but institution dependent	1998–2001	62 countries	IM (fuels, ores, and minerals)
Stijns (2006)	Positive	1975–2000	152 countries	IM (oil, gas, and metals)
Davis (2009)	Positive	1956–1999	88 countries	IM
Loayza and Raddatz (2010)	Neutral	1985–2000	51 countries	IM
Daniele (2011)	Negative, but institution dependent	1980–2004	153 countries	IM (oil, gas, and metals)
Goderis and Malone (2011)	Negative in long term, positive in short term	1965–1999	90 countries	IM (oil, gas, and metals)
Ross (2012)	Negative via conflicts and patriarchy	1960–2006	170 countries	IM (oil and gas)
Davis and Cordano (2013)	Mixed	1967–1997	57 countries	IM (oil, gas, metals)

Table 1b
Sub-national panel studies.

Authors	Findings	Period	Cases	Mode of extraction
Freudenburg and Wilson (2002)	Negative	1970s–1990s	19 studies, US rural areas	IM (all minerals)
Booth (2003)	Positive	1990s	Indonesia	IM/ASM
Slack and Jensen (2004)	Negative	1974–1998	US	IM (all minerals)
Stedman et al. (2004)	Positive for income	1996	Canada	IM (mining and energy)
Buccellato and Mickiewicz (2009)	Negative through inequalities	2000–2004	86 Russian regions	IM (oil and gas)
Lagos and Blanco (2010)	Positive for income and income distribution, but negative on health and quality of life	1985–2008	Chile, Antafagosta	IM (copper)
Saha et al. (2011)	Mixed	2005	600 households, Orissa, India	IM (iron)
Deaton and Niman (2012)	Negative in long term, positive in short-term	1960–2000	399 Appalachian counties, US	IM (coal)
Jensen et al. (2012)	Positive for education of children of miners	2000	Chile	IM (copper)
Perdue and Pavela (2012)	Negative	1997–2009	55 West Virginian counties, US	IM (coal)
Wilson (2012)	Positive via less risky sexual behaviour among women during booms	2003–2008	9 mining cities, Zambia	IM (copper)
Aragón and Rud (2013)	Positive on incomes through backward linkages	1997–2006	Peru, Cajamarca	IM (gold)
Ge and Lei (2013)	Positive, especially for high income households	2007	China	IM (coal, metal ores, non-metal ores, petroleum and natural gas)
Caselli and Michaels (2013)	Negligible through public revenue transfers	1991–2000	3659 municipalities, Brazil	IM (oil)
Loayza et al. (2013)	Positive for poverty, negative for inequality	2007	1841 districts, Peru	IM (minerals)

Table 1c
Local case studies.[a]

Authors	Findings	Period	Cases	Mode of extraction
Heemskerk (2003)	Mixed (positive through income, negative through social and health impacts)	1996–1999	Suriname	ASM (gold)
Bury (2005)	Positive, except for resource access	1990s–mid 2000s	Cajamarca, Peru	IM (gold)
Hilson and Pardie (2006)	Negative, through mercury pollution	Mid 2000s	Ghana	ASM (gold)
Fisher (2007)	Mixed (formalization helps some, but hurts others)	2004	Tanzania (villages of Nyarugusu, Mgusu, and Makub)	ASM (gold, diamonds)
Yakovleva (2007)	Mixed (positive for income but negative over the long-term for women)	2006	Ghana, Birim North District	ASM (gold)
Bury (2008)	Mixed (improved access to produced and human capital resources but degraded access to natural and social capital resources)	1999–2003	Peru, Cajamarca	IM (gold)
Bush (2009)	Positive (displacement by IM and clampdown on ASM drastically increased poverty, esp. among women and youth)	1996–2007	Ghana, Wassa West District	ASM (gold)
Fisher et al. (2009)	Positive	2004–2006	Tanzania	ASM (gold and diamonds)
Idemudia (2009)	Negative via pollution	Early–mid 2000s	Niger Delta, Nigeria	IM (oil)
Tschakert (2009)	Positive	2006	Southwestern Ghana	ASM (gold)
Hinojosa (2011)	Negative for lack of effective revenue decentralization		Bolivia and Peru	IM (hydrocarbons and metals)
Kamlongera (2011)	Positive when earnings allocated to productive activities	2010–2011	Malawi	ASM (gems)
Maconachie (2011)	Positive, including through linkages with agricultural sector	2004–2008	Sierra Leone, Kayima	ASM (gold, diamonds)
Wiebelt et al. (2011)	Positive long term effects when smoothing mechanisms implemented	2010–2027	Ghana	IM (oil)
Hilson (2012)	Negative in the absence of formalization	Mid 1990s–late 2000s	Northern Ghana	ASM (gold)
Idemudia (2012)	Negative for lack of effective revenue decentralization	Early–late 2000s	Niger Delta, Nigeria	IM (oil)
Mwitwa et al. (2012)	Negative through loss of resource access	Early 1970s–late 2000s	Copper belt, Zambia and DRC	IM (copper)
Zulu and Wilson (2012)	Negative for lack of empowerment	Mid–late 2000s	Sierra Leone	IM and ASM (gems)
Ackah-Baidoo (2013)	Negative for lack of empowerment	2007–2012	Coastal Ghana	IM (oil)
Hilson et al. (2013)	Positive through livelihood diversification	Late 2000s	Northern Ghana	ASM (gold)

Table 1c (*Continued*)

Authors	Findings	Period	Cases	Mode of extraction
Hinojosa (2013)	Mixed (negative for older generation, positive for younger generation)	2000–2010	Southern Peruvian Andes	IM (gold)
Kamlongera (2013)	Negative through lack of voice	Late 2000s–2012	Malawi	IM (uranium)/ASM (gems)
Pegg and Zabbey (2013)	Negative through pollution	2008	Niger Delta, Nigeria	IM (oil)
Van Alstine and Afionis (2013)	Negative due to lack of engagement	2005–2011	Northwestern Zambia	IM (copper)
Canavesio (2014)	Positive for ASM, mixed for IM	2004–2008	Southern Madagascar	IM (ilmenite)/ASM (gems)
Kelly (2014)	Positive (if predated upon by armed groups)	2012	DRC, South Kivu	ASM (cassiterite, coltan, gold)
Nel et al. (2013)	Positive but high health risks	1998–2010	South Africa, Indwe	ASM (coal)

[a] This selection represents the findings from the (limited) search strategy employed for this study; numerous other local case studies have been published (for example, related to livelihoods and ASM), that are not included in this table. We included poverty-related insights from some of these other studies within the discussion of findings and linkage mechanisms.

mechanisms identified below (see Table 3) account for the population scales at which they occur, as well as the modes of resource exploitation studied. Our review highlights that relatively few empirical studies employ mixed-methods to grapple with the nuanced effects of extractive industries on poverty outcomes at the sub-national level (e.g. regional and local population scales). Not only would such an approach help scholars to more robustly test for the effects of EI, but it could also contribute to policymakers' ability to design and implement appropriate interventions to maximize EI's potential contributions to poverty reduction efforts.

3.1. Poverty reduction

We identify six mechanisms purported to link extractive industries and poverty reduction and review each in turn.

3.1.1. Catalyst for growth

The World Bank has argued that economic growth is good for the poor. Extending the argument, advocates for extractive industries suggest that they are a catalyst for national growth and, by extension, an indirect contributor to poverty reduction. The World Bank's Mining Department claims:

> Overall, economic growth per se is a well-documented prerequisite to sustainable development and poverty reduction. Growth in national income has been shown to benefit all groups, including the poorest, and is strongly associated with other measures of well-being such as health, nutrition, and education. Thus, growth in GDP/capita, whether based on the creation of mineral wealth or on other assets, can also be expected to reduce poverty profiles overall. (Weber-Fahr, 2002: 13).

Cross-national studies, however, have generally found poverty *exacerbation* effects via the national growth mechanism rather than poverty reduction. An early study by Ross (2001) found mineral-dependent countries to be affected by higher levels of inequality that undermine the poverty reduction potential of growth gains. Davis (2009), on the other hand, contended that growth in extractive economies was more likely to be *pro-poor* than is growth in non-extractive economies. However, in a subsequent study using panel data rather than cross-sectional data, Davis and Cordano (2013) found no statistically significant positive or negative correlation between the level of resource extraction and the likelihood of pro-poor growth and could not substantiate that growth in extractive economies is unambiguously pro-poor. Their findings resonate with those of Loayza and Raddatz (2010) who observed neither positive nor negative effects of mining sector growth from a sample of 51 countries, attributing the lack of poverty reduction to the frequently low labour intensity and economic linkages of IM.

3.1.2. Fiscal transfers

Both ASM and IM can generate fiscal revenues to reduce poverty when invested in health care and education. The fiscal mechanism is generally emphasized for IM due to its relative size and ease of taxation compared to ASM (Weber-Fahr et al., 2001; Pegg, 2003). Governments can also utilize revenues to indirectly reduce poverty by financing infrastructure projects that generate jobs and economic growth, for example, as argued by Weber-Fahr et al. (2001). Yet the effects of fiscal revenues vary widely according to the resources involved, the commercial attractiveness of reserves, and the national regulatory framework. Given the fixity of mineral reserves, governments can, at least theoretically, exercise bargaining leverage over companies when negotiating tax rates. They can be set at levels that increase government take, but do not dissuade foreign direct investment over time – taking into consideration

Table 2a
Sample findings by scale of study.

	Negative	Neutral/mixed	Positive	Total
Cross-national studies	6	2	2	10
Sub-national panels	4	2	9	15
Local case studies	11	5	10	27
Total	21	9	21	52

Table 2b
Sample findings by mode (scale) of production.

	Negative	Neutral/mixed	Positive	Total
Industrial mining	19	7	11	37
ASM	4	3	11	18
Total	23	10	22	55

Note: Three studies provide findings for IM *and* ASM.

Table 3
Main mechanisms proposed.

Poverty reduction
•Catalyst for growth (national scale)
•Fiscal transfers (national, regional and local scales)
•Direct employment (local scale)
•Upstream and downstream linkages (national, regional and local scales)
•Private investment in public goods (regional and local scales)
•Corporate Social Responsibility initiatives (regional and local scales)
Poverty exacerbation
•Economic underperformance (national scale)
•Inter-sectoral mobility (regional and local scales)
•Exacerbation of Inequality (national and regional scales)
•Employment volatility (local scale)
•Economic enclaves (national, regional and local scales)
•Rent seeking and corruption (national, regional and local scales)
•Environmental and social impacts (regional and local scales)

both the 'obsolescing bargain' argument associated with high sunk capital costs, which favour governments (Buckley, 2008); but also the rising costs associated with fuller resource recovery, which incite companies to terminate projects. Cross-national studies in our survey found some evidence that fiscal revenues from extractive industries can have poverty reduction effects when invested in programmes that promote human capital, highlighting the importance of the state in this relationship (Bulte et al., 2005; Daniele, 2011).

Case studies reinforce the point that national policies and state institutions are important mediating factors in translating resource revenues into poverty reduction. For instance, using Ghana to model how oil revenues can promote poverty reduction, Wiebelt et al. (2011) emphasized that governments must implement smoothing mechanisms coupled with targeted infrastructure spending that alleviates anti-rural/agricultural biases. Similarly, Hinojosa's (2011) study of IM and poverty reduction efforts in Peru and Bolivia also highlight the role of domestic institutions, concluding that newly implemented fiscal decentralization schemes are of limited effect precisely due to the lack of technical expertise and capacity of provincial and local governments.[2] Using survey data and administrative records to examine the effects of fiscal transfers of oil revenues through 'oil-rich' municipalities in Brazil, Caselli and Michaels (2013) observe lower improvements in household income and public goods than expected from reported high spending; they suggested both embezzlement and vote-buying by mayors as a possible explanation. Earlier cross-national studies found that resource-rich low and middle-income countries systematically underinvested in education and health care (Gylfason, 2001; Ross, 2001; Birdsall et al., 2000) yet argued that *well managed* fiscal revenues could – at least theoretically – contribute to poverty reduction. Saad-Filho and Weeks (2013) also reject the notion that mineral wealth has systematic deleterious effects as some of the 'resource curse' literature suggests (Busse and Gröning, 2013; Kennedy and Tiede, 2013). In this line of argument, curse-like symptoms are instead attributed to poor government decisions, including "the lack of political will to build distributive economic policy alternatives" (Saad-Filho and Weeks, 2013: 13). Overall, scholars generally agree that the capacity and willingness of governments to effectively implement fiscal transfers, especially at the sub-national level, is a critical intervening factor in the relationship between mineral resources and poverty.

In terms of research methods and scale of analysis, these studies focus on the sub-national level. However, even *within* resource-rich low and middle-income countries, institutional efficacy and policy decisions may vary widely, with some regional and local governments having greater capacity than others to harness fiscal revenues for poverty reduction. Future research that combines quantitative and qualitative techniques could generate important insights into whether, within specific national contexts, resource revenues are significantly correlated with human capital measures across administrative jurisdictions and why this may be the case. The influences of global lending institutions on fiscal transfers in low and middle-income countries should also be taken into account. Such studies could assist policymakers in understanding the conditions under which resource rents or other fiscal mechanisms are most likely to deliver sustainable solutions to poverty reduction.

[2] Several studies have also noted the rise of revenue distribution at the regional and local scales (Radetzki, 1994), including for indigenous groups (O'Faircheallaigh, 2013). Segal (2011) has argued that global poverty could be halved through universal cash transfer from resource revenues to citizens, but few schemes exist to test this proposition (e.g. Alaska, Iran and Bolivia). Misallocation and poor accountability in fiscal decentralization or localized revenue allocation have been identified (e.g. in Nigeria, see Idemudia, 2012; in Sierra Leone, see Le Billon and Levin, 2009; Zulu and Wilson, 2012).

3.1.3. Direct employment

Extractive industries purportedly contribute to poverty reduction by creating jobs for the poor, especially if tied to capacity-building initiatives. In this line of analysis, it is noted that extractive sector jobs generally have the potential for higher income earnings than other livelihood options in mining communities (on ASM, see Siegel and Veiga, 2010; on IM, see Weber-Fahr et al., 2001). In addition, it is also argued that job creation may have positive inter-generational effects as increased earnings can allow children of parents employed in extractive industries to attend school rather than engaging in household livelihood-supporting activities (Jensen et al., 2012).

It is important, however, not to overstate the opportunities for direct employment in IM, as this high-skill, capital-intensive mode of resource exploitation tends to operate in communities with limited relevant skills. Even in high-income countries, IM may produce relatively few jobs compared to other sectors. For example, in a sub-national statistical analysis of the socio-economic effects of coal mining in the U.S. state of West Virginia, Perdue and Pavela (2012) found that mining communities had higher unemployment and poverty levels than non-mining communities. Perdue and Pavela (2012: 378) attribute this, in part, to the increasingly mechanized nature of coal mining. Case studies from low and middle-income countries also highlight the limited employment opportunities IM offers to residents of mining communities (Van Alstine and Afionis, 2013: 366; Ackah-Baidoo, 2013: 413). Indirect jobs (see "linkages" section below) may be the more likely avenue through which IM can contribute to poverty reduction through employment. By contrast, ASM has much greater potential for directly employing the poor. Despite the health and environmental risks, this mode of resource exploitation represents a viable source of primary and supplementary income for impoverished populations (Siegel and Veiga, 2010; Tschakert, 2009), particularly for rural farming households needing to diversify their livelihood base (Hilson and Garforth, 2013). The ASM sector's low-tech and low-skilled nature means that barriers to entry are low; in some cases, ASM may be the only realistic livelihood option available (Siegel and Veiga, 2010; Spiegel, 2012; Tschakert, 2009).

Several sub-national case studies confirm ASM's potential poverty reduction effect via employment. For example, Hilson et al.'s (2013) study of the Bole District of Northern Ghana found that ASM enabled poor rural households in the village of Kui to obtain wage earnings and diversify livelihoods. Due to the harsh climatic conditions of the region, subsistence food production historically took priority for families there, subsequently delaying their entrance into the wage economy and limiting their ability to escape poverty. ASM enabled farmers to earn wages during harsh growing seasons and even allowed many families to send their children to school (Hilson et al., 2013: 129). This study confirms a critical feature of ASM in poor communities: it is not necessarily a 'stand-alone' activity but rather one that can be used to diversify the portfolio of livelihood activities. A similar study in Northern Tanzania found that individuals who worked as artisanal miners were less likely to experience poverty than those with other occupations living in the same areas (Fisher et al., 2009: 38). In Suriname, self-employment within ASM areas is an effective means for women to gain independent income, though not to alleviate their poverty when accounting for negative long-term social and health impacts (Heemskerk, 2003; for a review on women and ASM see, Jenkins, 2014). More generally, Krishna (2004) concludes that non-agricultural sources of income, especially mining income, are an important factor for households in rural India to escape poverty.

While ASM has greater direct employment and income earning potential than IM, this mode of resource exploitation is limited in

its ability to sustainably reduce poverty due to the marginalized position it occupies within the development agenda (Hilson and McQuilken, 2014). Not only do artisanal miners frequently lack access to credit and land, but their human rights are frequently violated (Zulu and Wilson, 2012; Hilson and Pardie, 2006; Hilson, 2012; Hilson et al., 2013; Spiegel, 2014a,b). In sum, studies suggest that facilitating access to the ASM sector is needed, which requires coordinated action on behalf of governments in producing countries and development organizations (Hilson and McQuilken, 2014). *Facilitation*, however, does not necessarily equate simply to '*formalization*' as formalization processes in the ASM sector can represent a barrier to entry for the poor and may even serve to entrench pre-existing power and inequality structures within heterogeneous ASM communities (Fisher, 2007; Maconachie and Hilson, 2011).

Methodologically speaking, complementing the cross-sector research approaches that Maconachie (2011) and Hilson et al. (2013) develop to understand livelihood challenges in ASM communities – and their relation to farming, Fisher et al.'s (2009) study is a model of the type of mixed methods-based research that we argue could greatly assist policymakers in structuring interventions to maximize the poverty reduction benefits of EI. They combine random sampling of rural households and a probit analysis with qualitative interviews. Not only does the statistical component of their study demonstrate a general positive poverty reduction effect via employment in Northern Tanzania, but their incorporation of qualitative interviews also provides tools for understanding how particular household strategies in response to employment opportunities have helped or hindered poverty reduction outcomes.

3.1.4. Upstream and downstream linkages

A fourth argument in studies advancing the position that extractive industries reduce poverty is that extractive industries can indirectly contribute to poverty reduction efforts at national population scales by generating opportunities for the development of non-extractive industries industrial activity in host countries. For example, a common argument in recent years has been that governments and private actors can invest mining rents and services into the development of indigenous processing and refinement facilities that add value to raw commodities before export. Additionally, it is argued that both IM and ASM can support non-mining sectors and various small and medium enterprises (SMEs) in producing regions and communities (e.g. agriculture, food services, hospitality). The World Bank estimates that IM creates 2–25 times as many indirect jobs than direct ones, depending notably on the sector and local capacities (Weber-Fahr et al., 2001: 9–10); while ASM may create as many as 6 downstream jobs for every individual directly employed in the sector (Hilson and McQuilken, 2014: 105).

In a comparative analysis of seven Sub-Saharan African countries, Morris et al. (2012) found extractive companies to have established mostly backward, rather than forward linkages as they outsourced exploration activities to domestic firms with superior local knowledge and procured local goods and services in the areas of accommodation, transport and logistics, security, and simple maintenance and repair. Observing that price booms reduced rates of transactional sex around large-scale copper mines in Zambia, Wilson (2012) suggests that positive employment spillovers in local markets generated employment for women outside the sex trade. However, while the linkage potential of extractive industries may contribute to poverty reduction during boom periods, it is important to appreciate that local service providers may be highly vulnerable to resource busts. For instance, even in industrialized countries, scholars have found that resource-linked industries and enterprises were highly susceptible to booms and busts (for an earlier review and case study of US offshore oil sector, see Freudenburg and Gramling, 1998). As commodity prices fall, demand for resource-related goods and services may also decline, depending notably on the degree of dependence services providers have on the resource local sector.

Moreover, while the aforementioned studies suggest that IM may not inherently operate as enclaves and can have poverty reducing multiplier effects through indirect job creation assertions that extractive industries can catalyze the emergence of 'indigenous' downstream processing and refinement industries appear to be exaggerated. As Pegg (2003) and Abugre and Akabzaa (1997) note, many mining projects are surface operations involving heavy earth moving equipment that utilize few innovative and transferrable technologies. This characteristic of IM underscores the importance of companies and development organizations actively supporting host government efforts to invest in education programmes and training in technology intensive sectors (Pegg, 2003), including vertically and horizontally linked sectors. It also points at the value of diversified economic activities that may be linked, but not wholly dependent on, resource industries vulnerable to busts.

3.1.5. Private investment in public goods

Another common argument is that IM can indirectly contribute to poverty reduction when mining companies construct or improve transportation, power, and water-based infrastructure, from which impoverished populations (particularly rural) may also benefit. The World Bank argues that extractive industries can contribute indirectly to regional and local-level poverty reduction efforts through investments in physical infrastructure as these constitute 'public goods'[3] in that they can often support non-mining economic activities (Pegg, 2003). The construction of road networks, for instance, can sometimes allow subsistence farmers to access new and larger markets for the sale of their produce. Yet bulk minerals export infrastructure is designed to be economically efficient and follow the most secure routes, with important trade-offs regarding economic diversification and poverty reduction objectives. Leveraging IM infrastructure often demands a high level of planning and coordination as well as financial incentives such as co-investments by host governments and development banks.

By contrast, ASM is often portrayed as offering limited opportunities for investment in (formal) public goods infrastructure as a result of its informality, limited access to aggregate investment capital, supposedly transient character, and lack of support from authorities. The poverty-driven nature of this mode of resource exploitation, along with the (often incorrectly) assumed transient nature of mining activities would also make it difficult for ASM to directly contribute in a formally measurable way to "official" public goods; nonetheless, ASM activities often generate a densification and improvement of electricity, transportation, and telecommunication networks as well as schools and health care facilities. Illustratively, a recent study comparing the poverty reduction effects of IM and ASM in Madagascar suggests that "the infrastructure development planned and produced by large-scale mining investments are less adapted to the needs of the local population than the development that occurs spontaneously by and for the local stakeholders of ASM activity" (Canavesio, 2014: 152).

[3] A public good is one that satisfies the criteria of *non-exclusion* and *non-rivalry*. A good is non-exclusionary when no actor can be prevented from its enjoyment and is non-rivalrous when an actor's consumption of it does not simultaneously prevent others from consuming it as well (i.e. it is not zero-sum), though in practice many public goods face budget constraints creating some rivalry (e.g. delays to receive health services).

The empirical literature has demonstrated no clear and systematic poverty reduction effect of private investment in public goods infrastructure. For example, Frynas (2005) highlights that many of Royal Dutch Shell's road building projects in the Niger Delta *by-pass* the villages that would benefit the most from them. On the other hand, in a case study of the Yanacocha mine in the Cajamarca region of Peru, Bury (2005) found that several rural communities surrounding the mine reported increased access to economic resources; some interviewees reported improved access to roads, potable water systems, and markets for their dairy products. However, while Bury's study provides some evidence that IM can contribute to poverty reduction through private investments in public goods, the results should be interpreted with caution as only the communities closest to the mine reported these benefits.

The few empirical studies that examine the infrastructure mechanism suggest two issues that warrant consideration. First, infrastructure investments made by companies may not always be best conceptualized as *public* goods. Rather, they may in effect act as *club* goods that benefit a select sub-group of stakeholders in producing regions or communities. This may be unintentional, as the constraints of physical geography or efficiency concerns simply exclude some from accessing the potential benefits of physical infrastructure. It may be more cost effective and efficient for companies to bypasses impoverished communities entirely, thereby contributing little to the non-mining economic activities of producing provinces. For instance, landlocked low-income countries and producing regions must often cede some of the positive spillover effects of infrastructure creation to neighbouring countries and regions that possess ports and appropriate infrastructure to facilitate the export of bulk materials. Second, some types of IM may be more likely to produce public goods infrastructure than others. Those involving the bulk export of commodities, such as coal and iron ore, necessitate road and/or rail transport infrastructure, whereas petroleum and gas operations utilize pipelines. Therefore, the former are more likely to produce physical infrastructure investments with poverty alleviation implications (Morris et al., 2012: 412).

3.1.6. CSR initiatives

Corporate Social Responsibility (CSR) can be defined as the "beyond-law obligations that companies must adhere to because their economic activities affect the social and ecological systems in which they are embedded" (Dashwood, 2012: 9).[4] It is often argued, for instance, that companies can mitigate the risk of their activities contributing to poverty by adhering to the International Finance Corporation's Performance Standards on Environmental and Social Sustainability. Companies can also participate in capacity-building projects in areas of health care, education, and skills training. While CSR is widely viewed by industry actors as a means to reduce poverty at local and regional levels, concerns exist as to whether companies are genuinely committed to socially and environmentally responsible practices; whether CSR addresses the structural roots of mining-induced poverty; or whether CSR may even be used by companies as a subtle form of political interference. Critics argue, moreover, that CSR is largely a public relations exercise by extractive companies (Slack, 2012), with a record of poor results (Campbell, 2012). For instance, poorly managed community development initiatives can generate pernicious forms of dependence when companies dole out social investments in an ad hoc and reactionary manner. This may be particularly problematic in regions and communities in which the state has been historically absent and companies are treated as pseudo-state actors. More troubling, social investments can easily influence the political dynamics of local communities. Companies can use them to co-opt particular groups and fragment the collective power and political voice of affected communities.

While companies frequently promote the contributions their CSR activities have made to poverty reduction, caution is warranted when interpreting this as definitive empirical evidence of CSR's poverty reducing effects. Our review of the empirical literature has found no systematic scholarly research (large-N quantitative or small-N qualitative) that has demonstrated a sustained poverty reduction effect from CSR. By contrast, various qualitative case studies have negated or problematized its poverty reduction effects (for a broader review of oil, human rights and CSR, see Watts, 2005). For example, Frynas (2005), Idemudia (2009) and Pegg and Zabbey (2013) argue that community development is simply not a priority for oil companies in the Niger Delta. Unwillingness to clean up oil spills and the use of gas flaring nullified the poverty reduction impacts of CSR initiatives in the region. Oil spills were particularly problematic as they increased material deprivation in fishing communities and forced families to pull their children out of school due to reductions in household incomes (Pegg and Zabbey, 2013: 398; Idemudia, 2009: 103). The case of Royal Dutch Shell in the Niger Delta even led Pegg and Zabbey (2013: 402) to claim that "CSR initiatives are likely to produce disappointing developmental outcomes" and are simply "a façade."

CSR, however, may produce some poverty reduction benefits for actors within communities in companies' direct area of influence. Based on a study of four communities in the Southern Peruvian highlands, Hinojosa (2013) concludes that CSR contributed to the development of human capital for younger generations in communities surrounding the mine. Nevertheless, CSR unintentionally increased the vulnerability of older generations, as they were less able to sustain rural farming activities as result of younger generations migrating to urban centres in search of greater opportunities. Hinojosa (2013: 430) also reports that many community members viewed the company's CSR initiatives as "insufficient compensatory mechanisms" to offset the more destructive environmental impacts of the mine.

We suggest that future studies of CSR and poverty reduction could devote greater analytical attention to the convergence of internal and external institutional factors when analyzing the effects of CSR initiatives in IM. There is a need for more scholarship theorizing and empirically analyzing how the nexus between internal company-based factors – such as the degree of alignment between social and operations arms of companies or organizational culture and corporate hierarchy – can interact with external political and social conditions to affect the manner in which CSR initiatives are employed and their success or failure. Mining companies themselves are as diverse as the domestic institutional contexts within which they operate. Therefore, two-level institutional analyses may produce insightful findings with respect to the effects of the CSR mechanism.[5]

3.2. Poverty exacerbation

We identify seven mechanisms possibly linking extractive industries to poverty exacerbation and review each in turn.

[4] Corporations have adopted CSR for a variety of reasons, such as capturing greater market share, reducing operational risks, and obtaining a social license to operate (Broad and Cavanagh, 1998; Bendell, 2004; Oetzel et al., 2007; Ruggie, 2013). See Dashwood (2012) for a comprehensive review of the factors leading to the global mining industry's adoption of CSR.

[5] See Dashwood (2012) for an example of how multi-level institutional analysis has been employed to understand CSR in the mining industry.

3.2.1. Economic underperformance

Several scholars find resource-rich countries to exhibit poor growth performance relative to resource-poor countries (Auty, 1994, 2001; Sachs and Warner, 1995; Ross, 2001; Weber-Fahr, 2002). In a reversal of the causal logic of positive growth benefiting the poor, extractive industries are said to be bad for the poor because of the structural limitations resource abundance and/or dependence place on growth rates. Dutch Disease and heightened vulnerability to economic shocks are two mechanisms commonly posited to explain why resource-rich developing countries experience negative growth and, by extension, are also less likely to reduce poverty. The effects of these mechanisms on poverty operate in part indirectly and at the national scale through their impacts on macroeconomic performance.

The Dutch Disease – coined in relation to the negative effects of the North Sea's gas boom on the economy of the Netherlands in the 1970s – refers to the adverse effects the export of oil, gas, and mineral commodities can have on non-extractive sectors, specifically agriculture and manufacturing. Mineral booms, while directly beneficial to the extractive sector, pull a country's productive assets, including skilled labour, away from non-resource sectors such as agriculture and manufacturing. They also cause an appreciation of a country's real exchange rate and the value of its currency, thereby making it cheaper to import agricultural and manufactured goods, undermining the competitiveness of domestic producers on international markets due to the increased price for their goods. Dutch Disease can thereby restrict the prospects for diversification. The failure to diversify, moreover, can heighten a country's vulnerability to resource price volatility. The boom and bust nature of extractive industries can induce economic instability, which can further contribute to declining growth rates over time. Moreover, volatility can prevent governments from acquiring predictable fiscal revenues and induce shortsighted planning policies that can result in a debt over-hang as revenues fail to recover (Van der Ploeg and Poelhekke, 2009).

Recent cross-national work has challenged earlier findings that resource-rich developing countries grew more slowly than resource-poor countries (Auty, 1994; Ross, 2001). However, using a dataset covering 1960–2006, Ross (2012) observed that, over that entire timeframe, oil-producing countries grew approximately at the same rate as others, attributing this 'puzzle of normal growth' to demographic effects and policy challenges. First, he explains that producing countries, particularly in the Middle East and North Africa, were less likely to incorporate women into the workforce, and as a result, depended on immigrant labour; his analysis also notes that the combination of high fertility rates and immigration in these countries led to unusually high population growth rates, and subsequently, lower economic growth rates when measured in terms of per capita income. Second, he argues that many governments struggled to design and implement appropriate policy responses to cushion themselves from oil price volatility.

While earlier studies attributed slow growth to the structural limitations that natural resources place on macroeconomic performance, recent studies suggest that the relationship between resources and growth is not so deterministic. Rather, domestic institutions and government policies mediate the relationship between mineral resources and growth outcomes (Saad-Filho and Weeks, 2013; Humphreys et al., 2007) and, consequently, the contribution of economic growth to poverty reduction, as was previously discussed.

3.2.2. Inter-sectoral mobility

As noted above, Dutch Disease can indirectly exacerbate poverty through its effects on employment in non-mining sectors. One such mechanism is inter-sectoral mobility, which refers to the ease with which labour can transition from one economic sector to another in response to shifting conditions. If barriers to mobility exist during boom periods (e.g. a lack of education and skills training opportunities), displaced labour from agricultural and manufacturing may not be re-absorbed into other productive sectors. As a result, unemployment or underemployment may increase and individuals may be at a higher risk of poverty. Dutch Disease can also have adverse effects on gender equality in low and middle-income countries as fewer manufacturing jobs are made available to women, thereby preventing women from entering the formal labour market and becoming more empowered politically (Ross, 2012: 117–118).

It is important to note that the poverty *exacerbation* through the mechanisms of inter-sectoral mobility is more likely to be associated with IM than ASM because the former is capital intensive and provides fewer opportunities for agricultural and manufacturing workers displaced due to the extractive sector development to be re-absorbed into IM. Conversely, ASM may actually provide significant numbers of jobs for labour displaced from other sectors due to a variety of factors, as barriers to entry into ASM are low. Thus it should be stressed that while the evidence suggests – at a very general level – that IM may have an overall negative impact on poverty reduction through displaced labour, findings support the notion that ASM can provide important avenues for poverty reduction for displaced labour groups. A growing body of research is documenting how ASM has been a vital source of income for women and men who otherwise would have no source of income due to political and economic crises, drought and other drivers of inter-sectoral labour mobility (Yakovleva, 2007; Lahiri-Dutt, 2012; Maconachie and Hilson, 2011; Spiegel, 2014a,b).

3.2.3. Exacerbation of inequality

Extractive industries can exacerbate poverty at national and regional scales through their effects on the distribution of wealth and power. Mineral rents can generate "horizontal" and "vertical" inequality (Ross, 2007). Horizontal inequality refers to the distribution of wealth across administrative jurisdictions. Governments in producing regions may refuse to share the fiscal revenues generated by extraction with other poorer jurisdictions that may depend on transfer payments. Vertical inequality refers to the distribution of wealth amongst citizens.

Several processes could plausibly explain the linkage between IM and inequality. First, as noted above, if displaced labour from agricultural and manufacturing sectors cannot be re-absorbed into other productive sectors during boom periods, unemployment may rise and change income distribution (Ross, 2007: 241). Second, the rents associated with IM can have negative effects on government responsiveness. High rents can create incentives for corrupt political behaviour, which can lead to resource revenues being diverted away from the public coffers. Additionally, high value minerals can play a role in exacerbating the problems of unresponsive rentier states. As mineral rents account for a higher proportion of government revenues – especially oil and gas – governments can become less susceptible to public demands (Ross, 2001, 2012). This can exacerbate inequality as the poor have even fewer opportunities to exercise political voice and power, such that EIs can in effect 'reflect' and 'magnify' existing entrenched inequalities.

Various cross-national studies have examined the relationship between mineral extraction and inequality. Ross (2001) observes that, while oil-exporting countries were no more unequal than non-oil exporting countries, mineral exporting countries were more unequal than their non-mineral exporting counterparts. Specifically, as mineral dependence increased, a smaller share of national income accrued to the poorest 20% of the population (Ross, 2001: 12); however, Ross (2007: 238) subsequently cautions

against drawing firm conclusions about this relationship due to the paucity of data on income inequality for most of the world's oil-dependent countries (i.e. Gini scores). While insufficient cross-sectional data exists from which to draw firm conclusions, panel data have indicated that a temporary reduction of inequalities may occur during resource booms, but that this can be followed by a gradual increase until inequality eventually returns to pre-boom levels (Goderis and Malone, 2011).

Sub-national-level studies have also demonstrated the inequality inducing effects of EI. For example, Ge and Lei (2013) note that the increased demand for coal, metal ores, non-metal ores, and petroleum and natural gas in China had heterogeneous effects on household incomes. High- and middle-income households in both rural and urban areas experienced the greatest income increases, whereas low-income households derived fewer income benefits. Buccellato and Mickiewicz (2009) observe a similar effect from oil and gas production in Russia, where only the top income quintile in producing regions experienced income benefits from oil and gas production increases. By contrast, the lowest four income quintiles experienced negative income effects from production increases.

It is important to note that inequalities, and more generally the inability of the poor to benefit from extraction-led development, may induce or exacerbate conflicts. Based on sub-national census data of poverty and inequality in Peru, Loayza et al. (2013: 1) suggest that "the inequalizing effects of mining activity, both across and within districts, may explain part of the current social discontent with mining activities in the country, even despite its enormous revenues [and the lower levels of poverty observed in mining districts]". There is also stronger evidence for higher conflict risks under condition of high *horizontal* inequality – that is, inequality between ethno-religious groups – compared to inequalities within homogenous societies (Stewart and Annan, 2008). Wegenast and Basedau (2014) confirm that ethnic fractionalization increases the risk of armed conflict, at least for a subset of oil rich countries (though not specifically accounting for horizontal inequality). There is also anecdotal evidence that community-level conflicts around extractive industries – including inequalities within communities – can escalate into armed conflicts (Le Billon, 2013). More generally, there is robust evidence that the likelihood of large-scale armed conflicts increases with oil dependence, especially at lower levels of oil abundance and for on-shore oil (Ross, 2012). In turn, armed conflicts tend to exacerbate poverty and inequalities. Yet, interestingly, Bebbington and Bury (2009) and Bebbington (2012) argue that social resistance emerging under conditions of high inequality may be one mechanism through which countries can overcome some of the effects of resource curses – an argument resonating with findings from Dunning (2008) on the democratization effects of resource wealth in highly unequal Latin American countries. Social movements and public protests can thus have poverty and inequality reduction effects, notably by crafting in their wake institutions that foster more sustainable and equitable resource governance. More research, however, is needed to understand the conditions under which community-level risk can escalate, the conflict exacerbation effects of ethnic fractionalization can be reduced, and the progressive outcomes of protest movements can emerge.

3.2.4. Employment volatility

IM can exacerbate local poverty in producing communities through the periodic suspension of operations during bust periods as commodity prices fall below sustainable operating prices. Following sharp declines, companies may decide that certain operations should be suspended, negatively affecting both direct and indirect employment. Moreover, Freudenburg and Wilson (2002: 553) note that "even when higher incomes are associated with [the mechanization of] mining [in Appalachia], those incomes do not prove sufficient to alleviate the problems of poverty and unemployment so often associated with mining-dependent regions". Sub-national analyses of mining in the United States have confirmed the harmful effects of employment volatility. For example, Deaton and Niman (2012: 311) find poverty in Appalachian mining counties to have increased over the long term. This effect is due to the competing short- and long-term challenges confronting individuals when deciding whether to seek immediate employment in a high-wage sector or forego these gains to develop skills through secondary education for more sustainable employment. The decline in net secondary school enrollment rates in producing communities increases communities' long-term vulnerability to price and employment volatility.

In a related study, Slack and Jensen (2004) assess the effects of IM on underemployment. While individuals in the metal, coal, petroleum, natural gas in the U.S. were less likely to be underemployed than those in fishing/forestry and agriculture, their employment circumstances were much more volatile due to booms and busts. Slack and Jensen (2004: 143) conclude that, "[d]espite the relative advantages reaped by workers in mining relative to those in other extractive industries, employment in mining has [...] been subject to great instability". These studies demonstrate that even in high-income country contexts, the inherent volatility of resource prices can have adverse micro-level poverty impacts via employment volatility. Such studies, in turn, can help illuminate appropriate policy responses with respect to how best to promote diversification and human capital accumulation so that producing regions are more resilient in the face of price fluctuations.

3.2.5. Economic enclaves

Extractive industries are often characterized as enclave economies (Ferguson, 2005), with IM in particular hampering poverty reduction efforts when failing to develop forward or backward linkages to host country economies. Some scholars suggest that forward linkages are unlikely to develop in a globalized world in which international transportation costs are low, as it is financially feasible for companies to transport raw commodities back to high income countries for processing and refinement, as opposed to performing these in host countries (Sachs and Warner, 2001). Additionally, IM may reinforce technology and knowledge gaps as their capital-intensive nature creates minimal incentives for human capital investment and diffusion of innovative technologies to host countries (Pegg, 2006; Ross, 2012). These features can thereby prevent extractive industries from acting as a springboard for industrialization and diversification.

Cross-national studies identified in our survey mostly found resource wealth to be negatively correlated with growth due to the tendency of resource-rich countries to under-invest in human capital. For example Gylfason (2001) shows that resource-rich countries invested less in secondary schooling and have lower levels of gross secondary school enrollment (particularly for girls) due to the enclave nature of EI. More generally, Gylfason (2001: 856) argues that "[n]atural-resource-based industries as a rule are less high-skill labour intensive and perhaps also less high-quality capital intensive than other industries, and thus confer relatively few external benefits on other industries."

3.2.6. Rent seeking and corruption

Rents, or the revenues generated above and beyond normal production costs and company profits, can have corruption-inducing effects that undermine EI's potential contribution to poverty reduction (Leite and Weidmann, 1999). In general, corruption can undermine the relative performance of resource-based industries. For instance, vertical forms of corruption

between public and private agents can result in sub-optimal decision-making over the choice of companies and plans to develop resources, operational delays, and the diversion of funds generated by the sector away from populations (Kolstad and Søreide, 2009). Horizontal forms of corruption between private agents can result in tax evasion and a preference for speculative or high-return short-term productive activities, particularly to hedge against longer-term investment risks including contract renegotiation and possible demands for bribes (Le Billon, 2011; Ndikumana, 2013).

Studies demonstrate that countries with large oil and gas sectors and low levels of democratic institutionalization are more likely to be affected by higher levels of corruption (Gylfason, 2001; Leite and Weidmann, 1999; Bhattacharyya and Hodler, 2010; Arezki and Van der Ploeg, 2011). Ultimately, corruption risks diverting monies from the public coffers and away from the public good, while reducing the responsiveness of public officials to the needs of the poor. For example, sub-national qualitative research showed that efforts to use revenue decentralization to reduce poverty in the Niger Delta were undermined by rent seeking, corruption, and patronage (Idemudia, 2012).

The widespread perception of rent-seeking behaviour and corruption in extractive industries and the secrecy surrounding contracts and rents in the global oil and gas industries has prompted NGOs to demand greater revenue transparency from both firms and host governments. The movement towards 'disclosure as governance' in EIs through international multi-stakeholder initiatives such as the Extractive Industries Transparency Initiative (EITI) has been an indirect attempt to root out corruption and its attendant impacts through greater transparency and accountability. While revenue transparency mechanisms are viewed as critical for enhancing governance, the EITI remains a limited solution – notably for relying on civil society organizations often unable to challenge ruling elites while reducing the reputational concerns of extractive companies (Hilson and Maconachie, 2009; Gillies, 2010). These limits motivate mandatory disclosure and more stringent application of anti-corruption legislation at home government and international levels.

3.2.7. Environmental and social impacts

Extractive industries can exacerbate poverty at regional and local scales through their impacts on the environment as well as on human health and social capital in affected communities (Dudka and Adriano, 1997; O'Rourke and Connolly, 2003). Rural populations – particularly indigenous and peasant groups – who live in close proximity to mining operations can be especially vulnerable to EI-related environmental degradation, as such populations may rely directly on the natural environment for livelihood sustaining activities. If companies and policymakers do not take appropriate mitigation actions, extractive industries can have disastrous environmental and human health impacts that further impoverish these populations (from a strictly economic definition of poverty, or, perhaps more meaningfully in this context, adopting a wider concept of poverty). For example, air pollution and toxic waste from smelting can increase the incidence of respiratory illness. Acid rock drainage and cyanide leakage from mining operations can pollute groundwater, rivers, and soils, thereby reducing soil fertility and increasing livestock mortality. The recent Ebola outbreak in West Africa is having a devastating poverty-exacerbating impact; mining is among the factors driving deforestation of the region thought to be a major factor in initiating this disease, as forests were habitat for fruit bats, Ebola's reservoir host, who, in turn, have been concentrating into the remnants of their once-abundant habitat (Changula et al., 2014) Mining is not only thought to have played a major role in deforestation in the region, but employs thousands of workers who regularly travel into bat territory to get to the mines, increasing the risk of acquiring and spreading the disease. Indeed Ebola is only one of many diseases that have been linked to mining (Eisler, 2003), many if which can have profoundly impoverishing effects locally, regionally, nationally and beyond. Companies' activities can also indirectly exacerbate poverty at the global level through greenhouse gas emissions, which are responsible for accelerating the pace and scale of global climate change.

Extractive industries can have a range of additional adverse social effects. It has long been noted that mining induced displacement and resettlement can contribute to the further impoverishment of already poor populations when subsistence communities are forced to live on less fertile soils (Downing, 2002; Pegg, 2003); these concerns continue to be ever-more pressing. Both IM and ASM can radically alter the social milieu of affected communities. For example, the influx of seasonal/migrant workers (in many cases, predominantly male) can sometimes create new demands and opportunities for sex work; and changing patterns of mining-related migration have been associated with increases in the spread of infectious diseases such as HIV/AIDS (Rees et al., 2010). Additionally, higher wages received by those employed in extractive industries can increase the cost of living, making it harder for non-mining households to afford basic goods and services.

Several studies identified in our survey demonstrated such effects. For instance, Bulte et al.'s (2005: 1038–1039) cross-national analysis show that increases in mineral resource exports were correlated with increases in the percentage of countries' populations without access to improved water sources. Sub-national statistical analyses have also highlighted the direct human health impacts, which can be compounded by socio-economic inequalities induced by mining activities. Examining the impacts of iron-ore mines in the Indian state of Orissa, Saha et al. (2011) report an increase in the incidence of respiratory illness and malaria in downstream mining villages. Qualitative research has also generated similar insights into how the adverse environmental and social effects of extractive industries can exacerbate poverty. A comparative study of cases in Zambia and the DRC analyzed how copper mines led to increased deforestation adversely affecting forest-dependent communities (Mwitwa et al., 2012). Bury (2005: 233–234) reports that the Yanacocha mine in the Cajamarca region of Peru induced land use changes that restricted the portfolio of subsistence activities available to rural households. Additionally, he notes that families reported decreased access to natural resources, such as freshwater and irrigation networks, and a decline in inter-household relationships, community organizations, and local leadership.

While the above-cited studies spoke to poverty exacerbation associated with the environmental and social impacts of large and medium-sized mining companies, a different set of social and environmental impacts tends to be reported in the literature on ASM. One key concern in ASM scholarship is mercury pollution and its relationship to poverty dynamics. Hilson and Pardie (2006) examine how mercury is an "agent of poverty" in Ghana's artisanal gold mining sector as mercury amalgamation is widely used because it is the cheapest method for gold extraction; they examine miners' vulnerability to mercury poisoning, and the extent to which miners are forced to buy expensive medicines to deal with the health impacts. The link between poverty and mercury use in ASM has highlighted the need for new policy interventions, including consideration of grassroots micro-finance programmes, especially for women, to support environmentally safer gold production methods that can also lead to higher income (Spiegel et al., 2014).

Finally, although there is often much discussion on whether companies from certain countries lead to particularly severe social and environmental impacts, a growing body of literature aptly

points out the need for understanding local contexts and local poverty dynamics. Recent attention has been placed on the social impacts and environmental degradation associated with illegal Chinese-run ASM operations in African countries, reshaping debates about ASM dynamics (Hilson et al., 2014). The local social, fiscal and environmental impacts of large state-owned Chinese companies have also recently come under scrutiny, generating detailed reflection on the need for strengthening national regulatory frameworks and capacities (Haglund, 2009). González-Vicente (2013) stresses the need for *disaggregating* and *locally contextualizing* investment projects (he also focuses on Chinese investment), through careful attention to the historical and social dimensions in mining regions. The studies we reviewed in our survey varied considerably in the extent to which they disaggregated and contextualized extractive projects. They also varied considerably in the extent to which they considered how processes of neoliberalism in the extractive sector (Bridge, 2004; Campbell, 2012) have undermined local government capacity to regulate environmental and social impacts. As recent studies on community–company interactions demonstrate, failure to meaningfully engage with local stakeholders can ultimately undermine EI's contribution to local development (Kamlongera, 2013; Van Alstine and Afionis, 2013; Ackah-Baidoo, 2013). Our main point here is that social and environmental impacts associated with extractive sector developments can exacerbate poverty through diverse mechanisms, generating the need for multi-level and multi-disciplinary analysis. Analyzing effects that extractive industries have on poverty via their socio-environmental impacts requires researchers to consider how national regulatory frameworks, along with local capacities for collective action, influence impact assessment processes and subsequently the environmental, social, and human health impacts of extractive industries.

4. Concluding remarks

This survey of 52 studies, while limited by the narrowness of the search strategy and inclusion criteria employed (in which the word "poverty" had to be an explicit target of the research), nonetheless drives at an important result: there is no evidence of a 'universal' effect of extractive industries on poverty levels. As discussed above, this reflects in part the diversity of extractive industries, as well as the importance of contextual variables and diversity of linkages involved. Yet two particularly important findings emerge from this literature. First, institutions – including those at global, regional and local levels – condition the relationship between mineral resources and poverty outcomes through a variety of mechanisms. Second, the scales and modes of resource exploitation affect the scales and mechanisms through which extractive industries influence poverty. Analytically, IM and ASM can be treated as distinct independent variables, and even such duality is misrepresentative of the diversity of modes of extraction, and interactions between them. Several studies do indicate that the local effects of IM on poverty tend to be negative, especially when local affected communities lack voice and corporate practices are detrimental. In contrast, ASM can positively contribute to poverty reduction by diversifying the portfolio of livelihood activities of the poor, especially when households are facing economic stress factors. Greater attention to the scalar dimension of extractive industries is crucial for developing a nuanced understanding of the causal linkages and overall effects.

Our review of the literature has also yielded some recommendations for future research. Importantly, scale matters not only with respect to scale of production but also scale of analysis; future studies should employ mixed methods-based research to examine the poverty effects of extractive industries at a variety of scales, from the local to the national. This would enable scholars to begin to address some of the methodological and substantive gaps we find in the small but extant empirical literature focusing specifically on the relationship between extractive industries and poverty. While local studies based on ethnographic methods can offer important and detailed insights into the micro-level impacts of resource extraction in specific localities, these can be limited in their generalizability. Utilizing econometric methods to analyze not only cross-national but also sub-national and local level effects of extractive industries on poverty outcomes can therefore be useful complements to such studies. However, quantitative analyses should be combined with qualitative ones to allow scholars to avoid some of the reductionist tendencies of previous large-N cross-national studies, which tend to rely on nationally aggregated data and compare often vastly diverse extractive sector and institutional and contexts through a still limited range of variables. Methodological pluralism, particularly when focused on regional and local levels, could help scholars determine whether a specific mechanism was, in fact, responsible for the outcomes observed. Additionally, the creation of spatially disaggregated measures of both poverty and resource production can assist scholars in generating more nuanced findings and help disentangle the multi-scalar effects that distinct modes of exploitation have on poverty outcomes at different population scales.

Furthermore more evidence-based assessments of the effects of extractive sector governance initiatives are needed. At the national level, many resource rich low and middle-income countries have heeded the advice of international financial institutions by implementing resource revenue decentralization schemes to ensure that producing communities and regions benefit directly from their resource endowments. Such schemes have been implemented in an array of institutional and political contexts in low and middle-income countries, and it is therefore crucial to understand the domestic conditions under which they can reduce poverty. Moreover, analyzing the resilience of both local communities and national economies to commodity revenue collapse could produce fruitful insights on the relationship between extractive sectors and poverty, particularly if political, social and economic factors at multiple scales are taken into account. Such studies could produce policy-relevant knowledge for low and middle-income countries that have opened their economies to mineral investment and may provide some clues as to how they may fare after the possible end of the contemporary commodity 'super-cycle.' Finally, further context-specific multi-methods analyses of the impacts of multiplier effects of extractive sectors on poverty reduction – or conversely, the potentially devastating ripple effects of extractive sector-related poverty exacerbation – are needed to better understand broader costs and benefits of extractive sector activities over time and their distribution across society.

Acknowledgements

We are thankful to Gavin Hilson and two anonymous reviewers for their constructive comments. We acknowledge funding from the Canadian International Resources and Development Institute.

References

Abugre, C., Akabzaa, T., 1997. Social and Environmental Accountability Issues in Foreign Direct Investment (FDI) Flows to Africa: A Focus on the Mining Sector. Third World Network, Accra.

Ackah-Baidoo, A., 2013. Fishing in troubled waters: oil production, seaweed and community-level grievances in the western region of Ghana. Community Dev. J. 48 (3), 406–420.

Africa Progress Panel (APP), 2013. Equity in Extractives: Stewarding Africa's Resources for All. Africa Progress Report.

Aragón, F., Rud, J., 2013. Evidence from a Peruvian gold mine. Am. Econ. J. Econ. Policy 5 (2), 1–25.

Arezki, R., Van der Ploeg, F., 2011. Do natural resources depress income per capita? Rev. Dev. Econ. 15 (3), 504–521.

Auty, R.M., 1994. Industrial policy reform in six large newly industrializing countries: the resource curse thesis. World Dev. 22 (1), 11–26.

Auty, R.M., 2001. Resource Abundance and Economic Development. Oxford University Press, Oxford.

Banchirigah, S., Hilson, G., 2010. De-agrarianization, re-agrarianization and local economic development: re-orientating livelihoods in African artisanal mining communities. Policy Sci. 43 (2), 157–180.

Banerjee, A.V., Benabou, R., Mookkherjee, D., 2006. Understanding Poverty. Oxford University Press, Oxford.

Bebbington, A., 2012. Extractive industries, socio-environmental conflicts, and political economic transformations in Andean America. In: Bebbington, A. (Ed.), Social Conflict, Economic Development, and the Extractive Industry: Evidence From South America. Routledge, New York, pp. 3–26.

Bebbington, A., Bury, J., 2009. Institutional challenges for mining and sustainability in Peru. Proc. Natl. Acad. Sci. U. S. A. 106 (41), 17296–17301.

Bebbington, A., Hinojosa, L., Bebbington, D.H., Burneo, M.L., Warnaars, X., 2008. Contention and ambiguity: mining and the possibilities of development. Dev. Change 39 (6), 887–914.

Bendell, J., 2004. Barricades and Boardrooms: A Contemporary History of the Corporate Accountability Movement. UN Research Institute for Social Development, Geneva.

Bhattacharyya, S., Hodler, R., 2010. Natural resources, democracy and corruption. Eur. Econ. Rev. 54 (4), 608–621.

Birdsall, N., Pinckney, T.C., Sabot, R.H., 2000. Natural Resources, Human Capital, and Growth. Carnegie Endowment for International Peace.

Booth, A., 2003. Decentralization and poverty alleviation in Indonesia. Environ. Plan. C: Gov. Policy 21, 181–202.

Boschini, A., 2013. The resource curse and its potential reversal. World Dev. 43, 19–41.

Bridge, G., 2004. Mapping the bonanza: geographies of mining investment in an era of neoliberal reform. Prof. Geogr. 56 (3), 406–421.

Broad, R., Cavanagh, J., 1998. The Corporate Accountability Movement: Lessons and Opportunities. World Resources Institute, Washington, DC.

Buccellato, T., Mickiewicz, T., 2009. Oil and gas: a blessing for the few: hydrocarbons and inequality within regions in Russia. Eur. Asia Stud. 61 (3), 385–407.

Buckley, P., 2008. Do we need a special theory of Foreign Direct Investment for extractive industries? J. Chin. Econ. Foreign Trade Stud. 1 (2), 93–104.

Bulte, E.H., Damania, R., Deacon, R.T., 2005. Resource intensity, institutions, and development. World Dev. 33 (7), 1029–1044.

Bury, J., 2005. Mining mountains: neoliberalism, land tenure, livelihoods, and the new Peruvian mining industry in Cajamarca. Environ. Plan. 37 (2), 221–239.

Bury, J., 2008. Transnational corporations and livelihood transformations in the Peruvian Andes: an actor-oriented political ecology. Hum. Org. 67 (3), 307–321.

Bush, R., 2009. Soon there will be no-one left to take the corpses to the morgue': accumulation and abjection in Ghana's mining communities. Resour. Policy 34 (1/2), 57–63.

Busse, M., Gröning, S., 2013. The resource curse revisited: governance and natural resources. Public Choice 154 (1/2), 1–20.

Campbell, B., 2012. Corporate Social Responsibility and development in Africa: redefining the roles and responsibilities of public and private actors in the mining sector. Resour. Policy 37 (2), 138–143.

Canavesio, R., 2014. Formal mining investments and artisanal mining in southern Madagascar: effects of spontaneous reactions and adjustment policies on poverty alleviation. Land Use Policy 36, 145–154.

Caselli, F., Michaels, G., 2013. Do oil windfalls improve living standards? Evidence from Brazil. Am. Econ. J. Appl. Econ. 5 (1), 208–238.

Changula, K., Kajihara, M., Mweene, A.S., Takada, A., 2014. Ebola and Marburg virus diseases in Africa: increased risk of outbreaks in previously unaffected areas? Microbiol. Immunol. 58 (9), 483–491.

Collier, P., 2010. The Plundered Planet: Why We Must – and How We Can – Manage Nature for Global Prosperity. Oxford University Press.

Daniele, V., 2011. Natural resources and the 'quality' of economic development. J. Dev. Stud. 47 (4), 545–573.

Dashwood, H., 2012. The Rise of Global Corporate Social Responsibility: Mining and the Spread of Global Norms. Cambridge University Press, Cambridge.

Davies, V.A.B., 2009. Alluvial Diamonds: A New Resource Curse Theory. Center for the Study of African Economies, University of Oxford.

Davis, G., 2009. Extractive economies, growth, and the poor. In: Richards, J.P. (Ed.), Mining, Society, and a Sustainable World. Springer Verlag, Berlin, Heidelberg, pp. 37–60.

Davis, G.A.L., Cordano, V., 2013. The fate of the poor in growing mineral and energy economies. Resour. Policy 38 (2), 138–151.

Deaton, B., Niman, E., 2012. An empirical examination of the relationship between mining employment and poverty in the Appalachian region. Appl. Econ. 44 (3), 303–312.

Di John, J., 2011. Is there really a resource curse? A critical survey of theory and evidence. Glob. Gov. 17 (2), 167–184.

Downing, T., 2002. Avoiding New Poverty: Mining-induced Displacement and Resettlement. International Institute for Environment and Development.

Dudka, S., Adriano, D.C., 1997. Environmental impacts of metal ore mining and processing: a review. J. Environ. Qual. 26 (3), 590–602.

Dunning, T., 2008. Crude Democracy: Natural Resource Wealth and Political Regimes. Cambridge University Press, Cambridge.

Eisler, R., 2003. Health risks of gold miners: a synoptic review. Environ. Geochem. Health 25 (3), 325–345.

Ferguson, J., 2005. Seeing like an oil company: space, security, and global capital in neoliberal Africa. Am. Anthropol. 107 (3), 377–382.

Fisher, E., 2007. Occupying the margins: labour integration and social exclusion in artisanal mining in Tanzania. Dev. Change 38 (4), 735–760.

Fisher, E., Mwaipopo, R., Mutagwaba, W., Nyange, D., Yaron, G., 2009. "The ladder that sends us to wealth": artisanal mining and poverty reduction in Tanzania. Resour. Policy 34 (1), 32–38.

Franks, D.M., Davis, R., Bebbington, A.J., Ali, S.H., Kemp, D., Scurrah, M., 2014. Conflict translates environmental and social risk into business costs. Proc. Natl. Acad. Sci. U. S. A. 111 (21), 7576–7581.

Freudenburg, W.R., 1992. Addictive economies: extractive industries and vulnerable localities in a changing world economy. Rural Sociol. 57 (3), 305–332.

Freudenburg, W.R., Gramling, R., 1998. Linked to what? Economic linkages in an extractive economy. Soc. Nat. Resour. 11 (6), 569–586.

Freudenburg, W.R., Wilson, L.J., 2002. Mining the data: analyzing the economic implications of mining for nonmetropolitan regions. Sociol. Inq. 72 (4), 549–575.

Frynas, J.G., 2005. The false developmental promise of Corporate Social Responsibility: evidence from multinational oil companies. Int. Affairs 81 (3), 581–598.

Gary, I., Karl, T.L., 2003. Bottom of the Barrel: Africa's Oil Boom and the Poor. Catholic Relief Services.

Ge, J., Lei, Y., 2013. Mining development, income growth and poverty alleviation: a multiplier decomposition technique applied to China. Resour. Policy 38 (3), 278–287.

Gelb, A.H., 1988. Oil Windfalls: Blessing or Curse? Oxford University Press.

Gillies, A., 2010. Reputational concerns and the emergence of oil sector transparency as an international norm. Int. Stud. Q. 54 (1), 103–126.

Goderis, B., Malone, S.W., 2011. Natural resource booms and inequality: theory and evidence. Scand. J. Econ. 113 (2), 388–417.

González-Vicente, R., 2013. Development dynamics of Chinese resource-based investment in Peru and Ecuador. Latin Am. Polit. Soc. 55 (1), 46–72.

Gylfason, T., 2001. Natural resources, education, and economic development. Eur. Econ. Rev. 45 (4), 847–859.

Haglund, D., 2009. Regulating FDI in weak African states: a case study of Chinese copper mining in Zambia. J. Mod. Afr. Stud. 46 (4), 547–575.

Heemskerk, M., 2003. Self-employment and poverty alleviation: Women's work in artisanal gold mines. Hum. Org. 62 (1), 62–73.

Hilson, G., 2005. Strengthening artisanal mining research and policy through baseline census activities. Nat. Resour. Forum 29 (2), 144–153.

Hilson, G., 2012. Poverty traps in small-scale mining communities: the case of sub-Saharan Africa. Can. J. Dev. Stud. 33 (2), 180–197.

Hilson, G., Garforth, C., 2013. 'Everyone now is concentrating on the mining': drivers and implications of rural economic transition in the eastern region of Ghana. J. Dev. Stud. 49 (3), 348–364.

Hilson, G., Maconachie, R., 2009. Good governance and the extractive industries in sub-Saharan Africa. Miner. Process. Extract. Metall. Rev. 30 (1), 52–100.

Hilson, G., McQuilken, J., 2014. Four decades of support for artisanal and small-scale mining in sub-Saharan Africa: a critical review. Extract. Ind. Soc. 1 (1), 104–118.

Hilson, G., Pardie, S., 2006. Mercury: an agent of poverty in Ghana's small-scale gold-mining sector? Resour. Policy 31 (2), 106–116.

Hilson, G., Yakovleva, N., 2007. Strained relations: a critical analysis of the mining conflict in Prestea, Ghana. Polit. Geogr. 26 (1), 98–119.

Hilson, G., Amankwah, R., Ofori-Sarpong, G., 2013. Going for gold: transitional livelihoods in Northern Ghana. J. Mod. Afr. Stud. 51 (01), 109–137.

Hilson, G., Hilson, A., Adu-Darko, E., 2014. Chinese participation in Ghana's informal gold mining economy: drivers, implications and clarifications. J. Rural Stud. 34, 292–303.

Hinojosa, L., 2011. Riqueza mineral y pobreza en Los Andes (mineral wealth and poverty in the Andes). Eur. J. Dev. Res. 23 (3), 488–504.

Hinojosa, L., 2013. Change in rural livelihoods in the Andes: do extractive industries make any difference? Community Dev. J. 48 (3), 421–436.

Humphreys, M., Sachs, J., Stiglitz, J. (Eds.), 2007. Escaping the Resource Curse. Columbia University Press, New York.

ICMM, 2013. The Role of Mining in National Economies: Mining's Contribution to Sustainable Development. International Council on Mining and Metals.

Idemudia, U., 2009. Oil extraction and poverty reduction in the Niger delta: a critical examination of partnership initiatives. J. Bus. Ethics 90 (1), 91–116.

Idemudia, U., 2012. The resource curse and the decentralization of oil revenue: the case of Nigeria. J. Clean. Prod. 35, 183–193.

Jenkins, K., 2014. Women, mining and development: an emerging research agenda. Extract. Ind. Soc. 1 (2), 329–339.

Jensen, L., Yang, T.-C., Munoz, P., 2012. Natural resource dependence: implications for children's schooling and work in Chile. Soc. Nat. Resour. 25 (1–3), 3–21.

Kamlongera, P., 2011. Making the poor 'poorer' or alleviating poverty? Artisanal mining livelihoods in rural Malawi. J. Int. Dev. 23 (8), 1128–1139.

Kamlongera, P., 2013. The mining boom in Malawi: implications for community development. Community Dev. J. 48 (3), 377–390.

Karl, T.L., 1997. The Paradox of Plenty: Oil Boom and Petro-States. University of California Press, Berkeley.

Kelly, J., 2014. "This mine has become our farmland": critical perspectives on the coevolution of artisanal mining and conflict in the Democratic Republic of the Congo. Resour. Policy 40, 100–108.

Kennedy, R., Tiede, L., 2013. Economic development assumptions and the elusive curse of oil. Int. Stud. Q. 57 (4), 760–771.
Kolstad, I., Søreide, T., 2009. Corruption in natural resource management: implications for policy makers. Resour. Policy 34 (4), 214–226.
Krishna, A., 2004. Escaping poverty and becoming poor: who gains, who loses, and why? World Dev. 32 (1), 121–136.
Labonne, B., 2002. Commentary: harnessing mining for poverty reduction, especially in Africa. Nat. Resour. Forum 26, 69–73.
Lagos, G., Blanco, E., 2010. Mining and development in the region of Antofagasta. Resour. Policy 35 (4), 265–275.
Lahiri-Dutt, K., 2012. Digging women: towards a new agenda for feminist critiques of mining. Gend. Place Cult. 19 (2), 193–212.
Le Billon, P., 2011. Extractive Sectors and Illicit Financial Flows: What Role for Revenue Governance Initiatives? U4 Issue (13). .
Le Billon, P., 2013. Wars of Plunder: Conflicts, Profits and the Politics of Resources. Oxford University Press, New York.
Le Billon, P., Levin, E., 2009. Building peace with conflict diamonds? Merging security and development in Sierra Leone. Dev. Change 40 (4), 693–715.
Leite, C., Weidmann, J., 1999. Does Mother Nature Corrupt? Natural Resources, Corruption, and Economic Growth. IMF Working Paper WP/99/85. .
Loayza, N., Raddatz, C., 2010. The composition of growth matters for poverty alleviation. J. Dev. Econ. 93 (1), 137–151.
Loayza, N., Mier, Teran, A., Rigolini, J., 2013. Poverty, inequality, and the local natural resource curse. Policy Research Working Paper Series 6366. World Bank.
Luning, 2014. The future of artisanal miners from a large-scale perspective: from valued pathfinders to disposable illegals? Futures 62, 67–74.
Mabro, R., 1969. La Libye: Un état rentier? Projet 39, 1090–1101.
Maconachie, R., 2011. Re-agrarianising livelihoods in post-conflict Sierra Leone? Mineral wealth and rural change in artisanal and small-scale mining communities. J. Int. Dev. 23 (8), 1054–1067.
Maconachie, R., Hilson, G., 2011. Safeguarding livelihoods or exacerbating poverty? Artisanal mining and formalization in West Africa. Nat. Resour. Forum 35 (4), 293–303.
Mahdavy, H., 1970. The pattern and problems of economic development in rentier states: the case of Iran. In: Cook, M.A. (Ed.), Studies in the Economic History of the Middle East. Oxford University Press, Oxford.
Morris, M., Kaplinsky, R., Kaplan, D., 2012. One thing leads to another: commodities, linkages and industrial development. Resour. Policy 37, 408–416.
Mwitwa, J., German, L., Muimba-Kankolongo, A., Puntodewo, A., 2012. Governance and sustainability challenges in landscapes shaped by mining: mining-forestry linkages and impacts in the Copper Belt of Zambia and the DR Congo. For. Policy Econ. 25, 19–30.
Nel, E., Binns, T., Gibb, M., 2013. Community development at the coal face: networks and sustainability among artisanal mining communities in Indwe, Eastern Cape Province, South Africa. Geogr. J. 180 (2), 175–184.
Ndikumana, L., 2013. The private sector as culprit and victim of corruption in Africa. PERI Working Paper 330. Amherst University.
O'Faircheallaigh, C., 2013. Extractive industries and Indigenous peoples: a changing dynamic? J. Rural Stud. 30, 20–30.
O'Rourke, D., Connolly, S., 2003. Just oil? The distribution of environmental and social impacts of oil production and consumption. Annu. Rev. Environ. Resour. 28 (1), 587–617.
Oetzel, J., Getz, K., Ladek, S., 2007. The role of multinational enterprises in responding to violent conflict: a conceptual model and framework for research. Am. Bus. Law J. 44 (2), 331–358.
Pedro, A.M., 2006. Mainstreaming mineral wealth in growth and poverty reduction strategies. Miner. Energy Raw Mater. Rep. 21 (1), 2–16.
Pegg, S., 2003. Poverty Reduction or Poverty Exacerbation? World Bank Group Support for Extractive Industries in Africa. Report Sponsored by Oxfam America, Friends of the Earth-US, Environmental Defense, Catholic Relief Services, Bank Information Center, Washington, DC.
Pegg, S., 2006. Mining and poverty reduction: transforming rhetoric into reality. J. Clean. Prod. 14 (3), 376–387.
Pegg, S., Zabbey, N., 2013. Oil and water: Bodo spills and the destruction of traditional livelihood structures in the Niger Delta. Community Dev. J. 48 (3), 391–405.
Peluso, N., Humphrey, C.R., Fortmann, L.P., 1994. The rock, the beach, and the tidal pool: people and poverty in natural resource-dependent areas. Soc. Nat. Resour. 7 (1), 23–38.
Perdue, R., Pavela, G., 2012. Addictive economies and coal dependency: methods of extraction and socioeconomic outcomes in West Virginia, 1997–2009. Org. Environ. 25 (4), 368–384.
Radetzki, M., 1994. Mineral exploitation–regional development in a historical perspective. Miner. Energy 10 (1), 2–7.
Rees, D., Murray, J., Nelson, G., Sonnenberg, P., 2010. Oscillating migration and the epidemics of silicosis, tuberculosis, and HIV infection in South African gold miners. Am. J. Ind. Med. 53 (4), 398–404.
Ross, M., 2001. Extractive Sectors and the Poor. Oxfam America.
Ross, M., 2003. The natural resource curse: how wealth can make you poor. In: Bannon, I., Collier, P. (Eds.), Natural Resources and Violent Conflict: Options and Actions. The World Bank, Washington, pp. 17–42.
Ross, M., 2007. How mineral rich states can reduce inequality. In: Humphreys, M., Sachs, J., Stiglitz, J. (Eds.), Escaping the Resource Curse. Columbia University Press, New York, pp. 237–255.
Ross, M., 2012. The Oil Curse: How Petroleum Wealth Shapes the Development of Nations. Princeton University Press, New Jersey.
Ruggie, J., 2013. Just Business: Multinational Corporations and Human Rights. W.W. Norton and Company, New York.
Saad-Filho, A., Weeks, J., 2013. Curses, diseases and other resource confusions. Third World Q. 34 (1), 1–21.
Sachs, J.D., Warner, A.M., 1995. Natural Resource Abundance and Economic Growth. National Bureau of Economic Research.
Sachs, J.D., Warner, A.M., 2001. The curse of natural resources. Eur. Econ. Rev. 45 (4), 827–838.
Saha, S., Pattanayak, S.K., Sills, E.O., Singha, A.K., 2011. Under-mining health: environmental justice and mining in India. Health Place 17 (1), 140–148.
Segal, P., 2011. Resource rents, redistribution, and halving global poverty: the resource dividend. World Dev. 39 (4), 475–489.
Shaffer, P., 2013. Ten years of "Q-Squared": implications for understanding and explaining poverty. World Dev. 45, 269–285.
Siegel, S., Veiga, M.M., 2010. The myth of alternative livelihoods: artisanal mining, gold and poverty. Int. J. Environ. Pollut. 41 (3), 272–288.
Slack, K., 2012. Mission impossible? Adopting a CSR-based business model for extractive industries in developing countries. Resour. Policy 37 (2), 179–184.
Slack, T., Jensen, L., 2004. Employment adequacy in extractive industries: an analysis of underemployment, 1974–1998. Soc. Nat. Resour. 17 (2), 129–146.
Snyder, R., Bhavnani, R., 2005. Diamonds, blood, and taxes: a revenue-centered framework for explaining political order. J. Confl. Resolut. 49 (4), 563–597.
Spiegel, S.J., 2012. Microfinance services, poverty and artisanal mineworkers in Africa: in search of measures for empowering vulnerable groups. J. Int. Dev. 24 (4), 485–517.
Spiegel, S.J., 2014a. Legacies of a nationwide crackdown in Zimbabwe: operation Chikorokoza Chapera in gold mining communities. J. Mod. Afr. Stud. 52 (4), 541–570.
Spiegel, S.J., 2014b. Contested diamond certification: reconfiguring global and national interests in Zimbabwe's Marange fields. Geoforum (in press).
Spiegel, S.J., 2015. Rural place-making, globalization and the extractive sector: insights from gold mining areas in Kratie and Ratanakiri, Cambodia. J. Rural Stud. (in press).
Spiegel, S., Keane, S., Metcalf, S., Veiga, M., 2014. Implications of the Minamata Convention on Mercury for informal gold mining in Sub-Saharan Africa: from global policy debates to grassroots implementation? Environ. Dev. Sustain. 1–21.
Stedman, R.C., Parkins, J.R., Beckley, T.M., 2004. Resource dependence and community well-being in rural Canada. Rural Sociol. 69 (2), 213–234.
Stewart, F., Annan, K.A., 2008. Horizontal Inequalities and Conflict: Understanding Group Violence in Multiethnic Societies. Palgrave MacMillan, Basingstoke.
Stijns, J.P., 2006. Natural resource abundance and human capital accumulation. World Dev. 34 (6), 1060–1083.
Thorp, R., Bertram, G., 1978. Peru 1890–1977: Growth and Policy in an Open Economy. Columbia University Press, New York.
Tooze, R., Murphy, C.N., 1996. The epistemology of poverty and the poverty of epistemology in IPE: mystery, blindness, and invisibility. Millennium 25, 681–707.
Tschakert, P., 2009. Recognizing and nurturing artisanal mining as a viable livelihood. Resour. Policy 34 (1), 24–31.
Van Alstine, J., Afionis, S., 2013. Community and company capacity: the challenge of resource-led development in Zambia's 'New Copperbelt'. Community Dev. J. 48 (3), 360–376.
Van der Ploeg, F., Poelhekke, S., 2009. Volatility and natural resource curse. Oxf. Econ. Pap. 61 (4), 727–760.
Watts, M.J., 2005. Righteous oil? Human rights, the oil complex, and corporate social responsibility. Annu. Rev. Environ. Resour. 30, 373–407.
Weber-Fahr, M., 2002. Treasure or Trouble? Mining in Developing Countries. World Bank Group, Washington, DC.
Weber-Fahr, M., Strongman, J., Kunanayagam, R., McMahon, G., Sheldon, C., 2001. Mining and Poverty Reduction. World Bank, Washington, DC.
Wegenast, T.C., Basedau, M., 2014. Ethnic fractionalization, natural resources and armed conflict. Confl. Manage. Peace Sci. 31 (4), 432–457.
Wiebelt, M., Schweikert, R., Breisinger, C., Bohme, M., 2011. Oil revenues for public investment in Africa: targeting rural or urban areas? Rev. World Econ. 147, 745–770.
Wilson, N., 2012. Economic booms and risky sexual behavior: evidence from Zambian copper mining cities. J. Health Econ. 31 (6), 797–812.
World Bank, 2001. World Development Report 2000/2001: Attacking Poverty. World Bank and Oxford University Press, New York.
Yakovleva, N., 2007. Perspectives on female participation in artisanal and small-scale mining: a case study of Birim North District of Ghana. Resour. Policy 32 (1), 29–41.
Yates, D.A., 1996. The Rentier State in Africa: Oil Rent Dependency and Neocolonialism in the Republic of Gabon. Africa World Press.
Zulu, L., Wilson, S., 2012. Whose minerals, whose development? Rhetoric and reality in post-conflict Sierra Leone. Dev. Change 43 (5), 1103–1131.