

Other Configurative Reviews (e.g. evidence maps or scoping reviews)

Title

What is the evidence on the differential impact of mineral mining on local social groups already experiencing marginalisation and through which mechanisms these impacts occur?

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Biljana Macura, Charlotte Wagner, Marina Mautner, Laura Forni, Juan Camilo Betancur Jaramillo, Claudia Coleoni, Cynthia McDougall. What is the evidence on the differential impact of mineral mining on local social groups already experiencing marginalisation and through which mechanisms these impacts occur?: a Other Configurative Reviews (e.g. evidence maps or scoping reviews).

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Corresponding author's email address

biljana.macura@sei.org

Keywords

Gender equality and social inclusion, distributional justice, environmental impacts, extractive industries, poverty

Background

Mining has had substantial impacts on local communities and environments, but the mechanisms by which these impacts differentially affect marginalised groups and aggravate existing inequalities are less clear[1,2]. Understanding mechanisms that lead to differential impacts of mining on local marginalised social groups is crucial in minimizing such impacts. Marginalisation is the relegation to or placement in a depowered position based on social identities such as race, gender, sexuality or social class AND/OR the inequitable distribution of social, economic, environmental, physical and psychological resources[3]. It results in differential life conditions, leading to differential economic, health, and social outcomes among population groups. By synthesising evidence on differential local impacts of mineral mining, we aim to identify in what ways and through which mechanisms critical mineral mining affects local social groups already experiencing marginalisation and the mechanisms by which these impacts occur. The results of this review can help global stakeholders to develop more inclusive (critical) mineral supply chains that justly benefit local stakeholders, including marginalised groups, and minimise impacts on local environments. This review is done in the context of the predicted expansion of critical mineral extraction as part of a rapid transition towards 'green' energy sources and technologies in an effort to limit global warming to 2°C[4]. Many 'green' technologies contain minerals whose supply is limited and hence their extraction will be expanded substantially in the coming decade[5]. As critical mineral mining activities are in their early stages, evidence on the differential impacts of these activities is limited. Having a better understanding of the documented impacts of mining activities of minerals, in general, can help identify lessons learnt as well as potential solutions for improved critical mining outcomes. By reducing the risk of supply disruptions, ensuring responsible mining of minerals ultimately serves a global as much as a local purpose[5].

Theory of change or causal model

The review uses literature on differential local impacts of mineral mining to identify in what ways and through which key mechanisms critical mining may affect already marginalised groups. Within

this, the review will seek to identify how these impacts may influence (aggravate, ameliorate or maintain) marginalisation of local social groups. The mechanisms considered (linking mining activities to differential impacts and impacts to effects on equalities/marginalisation) will include how specific mining activities, as well as environmental, economic, or social and/or institutional mechanisms related to or supporting the mining activities modify the status quo by compounding or challenging existing vulnerabilities and exposures.

Stakeholder engagement

No early stakeholder engagement will be conducted. We will show preliminary findings to our stakeholder group (including representatives from academia, governments, and industry).

Objectives and review question

Primary questions: 1. What evidence exists on the differential impacts of mining on local social (and gender) groups already experiencing marginalisation? 2. What does the evidence indicate regarding resulting changes in level of marginalisation? 3. How does mining drive differential impacts? 4. How do differential impacts link to existing exposures and vulnerabilities of groups that already experience marginalisation? Secondary questions: 1. What does the evidence show on how policy and decision-support tools for mining planning elucidate distributional inequalities of impacts? 2. What are lessons learnt and scalable solutions that can be applied to new critical mineral mining developments?

Definitions of the question components

Settings: Social systems around or within the direct influence of (currently running or proposed) mine Exposure: Informal and formal subsoil mineral mining, including planning, prospecting, exploration, construction, operation, maintenance, expansion, decommissioning, reopening, repurposing, and abandonment. Outcome(s): Any description of indirect, positive or negative, potential or actual local differential impacts on marginalised local communities living in the mine vicinity and mechanisms leading to that impact. Differential impacts affect uniquely or differently a specific (set of) social group(s), either positively (such as affirmative measures) or negatively.

Search strategy

We will conduct searches in 2 bibliographic sources (as detailed below). Additionally, we will search bibliographies of relevant reviews identified during the search for relevant literature. See Supplement (sheet 1) for a detailed search strategy.

Bibliographic databases

We will conduct bibliographic searches in Scopus and Web of Science Core Collections (WoSCC) (consisting of the following indexes: SCI-EXPANDED, SSCI, AHCI, CPCI-S, CPCI-SSH, and ESCI, BKCI-SSH, BKCI-S, CCR-EXPANDED, IC) using English language search terms via the Tufts University library. Searches will be conducted on title, abstract and keywords. A search string formatted for WoSCC is shown below. See Supplement, sheet 2 for a detailed search strategy.

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TS=(((mining OR mine OR mines OR mined OR (extract* AND resource*) OR (extract* AND industr*) OR (extract* AND (mineral OR minerals))) AND (local* OR locat* OR site* OR case* OR "case stud*" OR "case countr*") AND ((impact* OR indicator* OR risk* OR incident* OR accident* OR assess* OR consequence* OR transition*) NEAR/6 (environment* OR health* OR wellbeing* OR household* OR livelihood* OR safe* OR developmen* OR economic* OR exposure* OR pollut* OR employ* OR income OR subsistence OR contaminat* OR "land?use*")) AND (gender* OR indigen* OR pover* OR peasant* OR marginali* OR intersectionality OR social* OR socio* OR *equit* OR *equal* OR men OR man OR women OR woman OR girl* OR boy* OR youth OR *binary OR impov* OR (social NEAR/3 class*) OR caste? OR disparit* OR distributional OR empower* OR race OR sexualit*))
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Web-based search engines

Due to time and resource constraints, searches on web-based search engines will not be conducted.

Organisational websites

Due to time and resource constraints, searches on organisational websites will not be conducted.

Comprehensiveness of the search

During the scoping phase, search results were screened against a benchmark list of 11 articles with known relevance to the review (see Supplement, sheet 3). In cases where relevant articles from the benchmark list were not found with the present search strategy, the search strings were examined to identify why articles were missed and were amended accordingly. This process was iterative. The final search string captures all articles from the benchmark list.

Search update

Search update will not be conducted.

Screening strategy

The screening will be done by at least two reviewers and at two levels: at title and abstract (screened concurrently for efficiency) and at full text. Full texts of records with relevant abstracts will be retrieved, tracking those that cannot be located or accessed and reporting these in the final review. Retrieved records will be screened at the full text, with each record being assessed by one experienced reviewer. The final report will include a list of articles excluded at the title and abstract, and at the full text, with reasons for exclusion.

Eligibility criteria

Eligible Settings: Social systems around or within the influence of (currently running or proposed) mines
Eligible Exposure: Informal and formal subsoil mineral mining, including planning, prospecting, exploration, construction, operation, maintenance, expansion, decommissioning, reopening, repurposing and abandonment. For the list of eligible minerals see Supplement, sheet 4. Studies without specific minerals to be mined will be excluded. Studies about sand, gravel, rock mining and river dredging will be excluded. Mining imports, off-site processing, recycling, and secondary production will be excluded. Mining of hydrocarbons (i.e., coal, and other fossil fuels) will not be considered. Eligible Outcome(s): Any description of indirect, positive or negative, potential or actual local differential impacts of mining on marginalised local social groups living in the mine vicinity and mechanisms leading to that impact. These mechanisms include mining preparations, activities, and processes, as well as related social and institutional processes that drive differential impacts and how they link to existing exposures and vulnerabilities of groups that already experience marginalisation. The (mechanisms of) impacts to non-humans or to actors external to communities living in the mine vicinity will not be considered. Eligible study types: Both primary and secondary (reviews) research studies will be considered, including empirical case studies and policy analysis. We will consider studies collecting qualitative, quantitative, and mixed-method data. Theoretical, methodological and conceptual papers, theses and dissertations, conference proceedings, environmental, social and health impact assessments, governmental reports and any other grey literature will not be considered. Eligible languages: English Time limitations: 2011-present

Consistency checking

Prior to commencing screening, consistency checking will be performed on a subset of records at both title and abstract and full-text levels. Specifically, up to 300 titles and abstracts and 20 full-text records will be independently screened by all reviewers. The results of the consistency checking will then be compared among reviewers and all disagreements will be discussed in detail. Where the

level of agreement among reviewers is low (below 80%), further consistency checking will be performed on an additional set of articles. This will be repeated until the agreement level reaches at least 80%.

Reporting screening outcomes

Screening outcomes will be reported using the ROSES flow diagram. The final report will also include a list of eligible articles and a list of excluded full-text articles with reasons for exclusion.

Study validity assessment

Study validity will be assessed using a mixed methods assessment tool [6]. As a result of the appraisal process, we might categorise relevant studies as, for example, having a high and low validity. This information will be used in a sensitivity analysis during the synthesis stage of the review. The cut-off points for each of the validity categories will be decided during the appraisal process and based on the overall state of the evidence base. To avoid selective outcome reporting bias, studies will not be excluded based on reporting of the outcome data. However, studies without sufficient methodological details will be categorised as unclear.

Consistency checking

To assure the repeatability of this stage and to test the appraisal tool, consistency checking will be performed on a subset of records (5) independently assessed by all reviewers. All disagreements will be discussed among the team, and assessment criteria will be clarified if needed. All the studies will be appraised by at least two reviewers.

Data coding strategy

In addition to bibliographic information, we will code study context, location and design, population descriptors including gender, social and economic status, exposure descriptors including type of mine, mined minerals, impact type and mechanisms behind the impacts (such as increased water exploitation especially effects communities depending on this resource more than non-marginalised groups (elevated exposure/vulnerability to impact), and hence is affected differently from other groups) (see Supplement, sheet 5 for detailed coding tool) The coding tool will be refined during the review process and based on the emerging themes from the literature. For missing or incomplete data related to the outcome, we will aim to contact study authors directly if necessary. Our extracted data records will be made available as additional files.

Meta-data to be coded

See the previous section.

Consistency checking

The repeatability of the extraction process will be tested on a subset of studies (5) independently assessed by all reviewers. All disagreements will be discussed among the team, and the extraction sheet criteria will be clarified if needed. The rest of the data will be extracted by a single reviewer.

Type of mapping

NA

Narrative synthesis methods

We will descriptively summarise each included study. This will be presented in a tabular form with an overview of study designs, populations, exposures and outcomes. Moreover, this review will apply best-fit framework synthesis[7,8,9] as a method for organising and synthesising diverse types of evidence. It includes six analytical stages. (1) In data familiarisation reviewers will get familiar with the topic under study. This stage is followed by (2) framework selection where a new framework can

be created, or a relevant existing framework, conceptual model or theory can be found in the literature (and adjusted to the needs of the review). At (3) the indexing stage, and informed by the framework, the review team will perform searches, screening, and data extraction and identify the main characteristics of relevant studies. In (4) the charting stage, characterised studies will be further grouped into categories and themes will be derived from the data. At (5) the mapping stage derived themes will be considered in the light of the original research question and we will investigate how derived themes relate to each other and to the framework that can be refined and expanded with new themes at this stage. At the (6) interpretation stage derived themes will be considered in the light of the wider research literature.

Knowledge gap identification strategy

The knowledge gaps will be identified through cross-tabulation of different variables (e.g. intervention vs. outcome and similar).

Demonstrating procedural independence

Reviewers who have also authored articles to be considered within the review will be excluded from decisions regarding the inclusion of their work.

Competing interests

The authors declare no competing interests.

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Author's contributions

BM drafted the initial version of the protocol and developed a review methodology. MM, CW together with BM, CMD and LF refined the review scope and search strategy. LF developed the theory of change. MM, CW and LF wrote the background and justification. All authors read, revised, and approved the manuscript.

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NA

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Authors and Affiliations

<u>Name</u>	<u>Country</u>	<u>Affiliation</u>
<i>Biljana Macura</i>	<i>Sweden</i>	<i>Stockholm Environment Institute, SEI HQ</i>
Charlotte Wagner	United States	Stockholm Environment Institute, SEI US
Marina Mautner	United States	Stockholm Environment Institute, SEI US
Laura Forni	United States	Stockholm Environment Institute, SEI US
Juan Camilo Betancur Jaramillo	Colombia	Stockholm Environment Institute, SEI Latin America
Claudia Coleoni	Colombia	Stockholm Environment Institute, Latin America
Cynthia McDougall	Thailand	Stockholm Environment Institute, SEI Asia

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