3 Ecological Distribution Conflicts (EDCs) over mineral extraction in India: An overview

3.1 Introduction 33
3.2 Materials and methods 34
3.3 Findings 35
  3.3.1 Patterns of mineral extraction in India 36
  3.3.2 Ecological distribution conflicts over mining 38
    3.3.2.1 Geographical occurrence 42
    3.3.2.2 Type of minerals 43
    3.3.2.3 Mining agency 44
    3.3.2.4 Protesters 44
    3.3.2.5 Causes for protest 46
    3.3.2.6 Duration and outcomes 48
3.4 Analysis 49
3.5 Conclusion 52

4 Resistances against predatory extractivism: Environmental injustices at iron ore peripheries in India

4.1 Introduction 53
4.2 Trends of iron ore extraction in India 54
4.3 EDCs against iron ore extractivism in India 56
  4.3.1 Bellary, Karnataka 56
  4.3.2 Caurem, Goa 56
  4.3.3 Dantewada, Chhattisgarh 57
  4.3.4 Gadchiroli, Madhya Pradesh 57
  4.3.5 Keonjhar, Odisha 58
  4.3.6 Praksham, Andhra Pradesh 58
  4.3.7 Kanker, Chhattisgarh 59
  4.3.8 West Singhbhum, Jharkhand 59
  4.3.9 Tiruvannamalai, Tamil Nadu 59
4.4 The ramifications of extractivism: Features of predatory extractivism at iron ore peripheries in India

4.4.1 Unequal economic gains 60

4.4.2 Large scale ecological degradation and cost-shifting of environmental externalities 61

4.4.3 Economic immiseration of ecosystem-dependent communities 62

4.4.4 Establishment of monoproductive economic systems 62

4.4.5 Cultural impacts of ecological degradation 63

4.4.6 Undermining democracy, and suppression of social resistance by State-corporate collusion 63

4.4.7 Militarization, rebel groups, and disruption of regular lives of citizens 64

4.5 Role of social resistances in altering patterns of extractivism 66

4.6 Conclusion 70

5 The existence and consequences of predatory extractivism in the iron ore mining belt of Odisha

5.1 Introduction 72

5.2 Trends of domestic extraction of metals in Odisha 73

5.3 The iron ore extractive frontiers of Odisha 81

5.4 Environmental, social, and economic implications of extractivism in Odisha 83

5.4.1 Economic implications 84

5.4.1.1 Illegal mining 85

5.4.1.2 Dependency on corporations 86

5.4.1.3 Abandonment of agricultural activities 87
### 5.4.2 Environmental implications

- **5.4.2.1 Water pollution**
- **5.4.2.2 Air pollution**
- **5.4.2.3 Management of waste generated from extraction**

### 5.4.3 Social implications

- **5.4.3.1 Impacts on wildlife, and generation of man-animal conflicts**
- **5.4.3.2 Repression of activists**
- **5.4.3.3 Tight vigilance on non-local people**
- **5.4.3.4 Influx of migrant labor and prostitution**
- **5.4.3.5 Induced complacency of local villagers**

### 5.5 Conclusion

### 6. An overview of impacts of iron ore extractivism in Goa

- **6.1 Introduction**
- **6.2 Background and description of field**
- **6.3 The extractive economy of Goa**
- **6.4 Impacts of iron ore mining in Goa**
  - **6.4.1 Impacts on agricultural activities**
  - **6.4.2 Water pollution**
  - **6.4.3 Air pollution**
  - **6.4.4 Noise pollution**
  - **6.4.5 Solid waste generation**
  - **6.4.6 Impacts on cultural ecosystem services**
  - **6.4.7 Impacts on wildlife**
- **6.5 Outcome of iron ore EDC in Goa and current scenario**
- **6.6 Conclusion**
7. Conceptualizing a post-extractive framework for resource peripheries in India

7.1 Introduction

7.2 Post-growth

7.2.1 Alternatives to GDP as an indicator of well-being and progress

7.2.2 Critique of economic growth on the basis of biophysical limitations

7.2.3 Critique of economic growth as a desirable project from a socioecological standpoint

7.3 Post-extractivism

7.4 Post-growth and post-extractivist streams of thought in India

7.5 Post-extractivist proposals for resource peripheries in India

7.5.1 Identification of resource peripheries

7.5.2 Documentation of cultural, religious, and other non-use values of local ecosystems

7.5.3 Assessment of local needs

7.5.4 Public dissemination of constitutional rights at current or potential regions of extractivism

7.5.5 Appropriate downscaling of extractivism

7.5.6 Exploring alternatives to extractivism

7.5.7 Exploration of alternative mechanisms of resource appropriation

7.5.8 Setup of diverse livelihood generation opportunities in regions of current or potential extractivism

7.5.9 Ensuring transparency of information flow in and out of regions of current or potential extractivism

7.6 Conclusion
8 Re-imagining mineral regulation in India: towards reconciling with local interests

8.1 Introduction

8.2 Major laws and principles governing social inclusion of local communities in decision-making

8.2.1 Constitution and Laws

8.2.1.1 Schedules V and VI of the Constitution of India

8.2.1.2 Panchayat (Extension to Scheduled Areas) Act, 1996

8.2.1.3 The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act

8.2.2 Principles

8.2.2.1 Public trust Doctrine

8.2.2.2 Precautionary Principle

8.3 The role of social mobilization in struggles for environmental justice

8.3.1 Samatha v. State of Andhra Pradesh

8.3.2 Rural Litigation and Entitlement Kendra,

Dehradun v. State of UP

8.3.3 Goa Foundation v. Union of India and ors.

8.3.4 Common cause v. Union of India

8.3.5 Odisha Mining Corporation v. MOEF and Ors

8.4 Towards Radical Mineral Democracy: A guiding framework based upon principles of post-extractivism

8.4.1 Inclusion of local communities

8.4.2 Downscaling extraction

8.4.3 Capture of windfall profits and redistribution of value of minerals

8.4.4 Transparency and accountability

8.5 Conclusion

9 Conclusion

10 Bibliography
Annexures
Annexures I - Data 190
Annexures II - Reports from the Field 200
Annexures III – EDCs 250
Annexure IV—Photographic documentation 273
Annexure V- Reference for databank of EDCs (Table 3.1) 286
# List of tables and figures

## List of figures

<table>
<thead>
<tr>
<th>Figure No.</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>Flowchart representing methodology used</td>
<td>No.</td>
</tr>
<tr>
<td>3.1</td>
<td>Trends of Domestic Extraction of major (non-fuel) minerals in India (1957-2013).</td>
<td>36</td>
</tr>
<tr>
<td>3.2</td>
<td>a) Year-wise and b) state-wise distribution of total EDCs against (non-fuel) mineral mining; c) state-wise distribution of EDCs against metal mining; and d) state-wise distribution of EDCs against non-metallic (non-fuel) mineral mining</td>
<td>42</td>
</tr>
<tr>
<td>4.1</td>
<td>a) Trends of total metallic ore extraction in India (1951-2013); b) Metallic ore extraction in India by major metallic minerals (1951-2013).</td>
<td>54</td>
</tr>
<tr>
<td>5.1</td>
<td>Mineral map of Odisha</td>
<td>74</td>
</tr>
<tr>
<td>5.2</td>
<td>Annual production of major metallic minerals in Odisha (1994-2015)</td>
<td>75</td>
</tr>
<tr>
<td>5.3</td>
<td>Comparison of annual production of metallic ore extraction in Odisha with the rest of India (2009-2010)</td>
<td>75</td>
</tr>
<tr>
<td>5.4</td>
<td>Per capita extraction of major metals- India versus Odisha: a) Total major metals; b) Iron ore; c) Bauxite; d) Chromite</td>
<td>77</td>
</tr>
<tr>
<td>5.5</td>
<td>Per square kilometer extraction of major metals- India versus Odisha: a) Total major metals; b) Iron ore; c) Bauxite; d) Chromite</td>
<td>79</td>
</tr>
</tbody>
</table>
Trends of utilization of total extractivism for annual internal consumption (in the domestic market) and exports (to the international markets) of major metals for export in Odisha (1994-2014): a) Iron ore; b) Chromite

River systems of Odisha

Hypothetical pictorial representations of aquifers under lateritic plateaus with ore bodies

Differences between claimed quantity iron production by tonnage and known exports of iron ore indicating misrepresentation of production data.

List of tables

<table>
<thead>
<tr>
<th>Table No.</th>
<th>Title</th>
<th>Page No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>Equally weighted index of iron ore extraction in India using above metrics.</td>
<td>12</td>
</tr>
<tr>
<td>3.1</td>
<td>Databank of anti-extractive conflicts in India.</td>
<td>39</td>
</tr>
<tr>
<td>5.1</td>
<td>Per capita extraction of major metals- India versus Odisha</td>
<td>76</td>
</tr>
<tr>
<td>5.2</td>
<td>Per square kilometers extraction of major metals- India v/s Odisha</td>
<td>78</td>
</tr>
<tr>
<td>6.1</td>
<td>Types of aquifers directly relevant to mining related conflicts.</td>
<td>103</td>
</tr>
<tr>
<td>6.2</td>
<td>Trends of extraction in terms of absolute quantities, tons per capita, and tons per sq. km. of Iron Ore in Goa (1999-2012)</td>
<td>106</td>
</tr>
<tr>
<td>6.3</td>
<td>Ratio of value of Iron ore extracted to GSDP</td>
<td>107</td>
</tr>
<tr>
<td>6.4</td>
<td>Export of iron ore from Goa: Exports as a percentage of production of iron ore in Goa (2004-2011)</td>
<td>108</td>
</tr>
<tr>
<td>6.5</td>
<td>Environmental injustices borne by local communities based on the phase of extractive operations</td>
<td>110</td>
</tr>
<tr>
<td>6.6</td>
<td>Population of scheduled tribes in the mining regions of Goa</td>
<td>117</td>
</tr>
</tbody>
</table>