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

5.1 Introduction

India, unlike other typical extractive and often peripheral or semi-peripheral economies, is distinct in that most resources are used for internal consumption (Singh et al., 2012), and therefore not a global extractive periphery. Although India is not subject to ‘ecologically unequal exchange’ as has been observed in other countries of the Global South, Martinez-Alier et al. (2016), hypothesize the presence of processes of ‘ecological internal colonization’ wherein certain states within the country serve as suppliers of primary commodities both to other states, as well as to the global market (Martinez-Alier et al., 2016), and bear resemblance to peripheral economies. In India, 11 states account for over 90% of the metal production, and iron ore is the predominant metal extracted in terms of volume—accounting for close to 87% of total metal extracted in 2013-14. This chapter examines whether there are peripheral regions—regions that are largely producers and suppliers of primary commodities, within India and follow the path of extractivist economies. The chapter explores the implications of such iron ore extractivism on the social, cultural, political and economic spheres of the lives of local indigenous communities residing in the iron ore mining belt of the north-western Odisha, one of the regions that can take credit for taking care of the 'source' function vis-a-vis this particular resource in recent times.

Towards addressing this question, academic as well as non-academic works have been consulted. In addition, on-the-ground experiences have been captured through semi-structured interviews conducted with relevant stakeholders. This chapter draws

49 Own calculations. Data Source: Indian Bureau of Mines, 2014
upon the academic and popular literature including reports from newspapers and journals, semi-structured interviews with agents of extractivism, lawyers of mining companies, NGOs, tribal people, local non-tribal residents, truckers, and local citizens.

The second section examines the trends and patterns of extractivism in Odisha between 2009 and 2013. The next section discusses expanding iron ore extractivism in the mining belt of Odisha, and the myriad impacts and outcomes using observations from the field. The chapter ends with a few concluding observations on iron ore extractivism in Odisha.

5.2 Trends of Domestic extraction of metals in Odisha

The state of Odisha has the largest stock and the most ‘diverse portfolio’ of metallic minerals in India. The state accounts for 94% of chromite, 92% of nickel ore, 69% of cobalt ore, 52% of bauxite, 44% of manganese, and 33% of iron ore (hematite) resources in the country as of 2010 (Odisha, IMYB, 2014). Given its large stock of mineral wealth, Odisha has also historically been a region of high metal extraction within India. The state is one of India’s largest producer of metals in India in terms of volumes of resources extracted. As of 2013-14, it was largest producer in terms of volume of bauxite, chromite, graphite, manganese ore, and iron ore (Odisha, IMYB, 2014). The state was the leading producer of, and accounted for close to 50% of iron ore production, 35% of bauxite production, and over 99% of chromite production in 2013-14. It was the third largest producer of manganese ore, accounting for 26% of total national production (Odisha, IMYB, 2014). Of the 30 districts in the state, 25 have mineral reserves.
Metal extractivism has rapidly increased in recent decades. Between 1994 and 2014, the total metallic ore production in the state increased from 11.93 MT/year in 1994-95 to 95 MT/year in 2013-14.\textsuperscript{50} The contribution of Odisha to metal production as compared against the rest of India is also significantly high. For instance, in 2009 Odisha accounted for 86 MT of the 230 MT, i.e., 37% of total metal production in the country. In 2013, this had increased to 48%, with Odisha producing close to 87 MT of the 180 MT of total metal ore production in the country.

\textsuperscript{50} Own calculations. Data source: IMYB, Odisha, 2014
Figure 5.2: Annual production of major metallic minerals in Odisha (1994-2015)


Figure 5.3: Comparison of annual production of metallic ore extraction in Odisha with the rest of India (2009-2010)

With metal extraction rates of 0.19 tons/pc/yr, and 73.58 tons per sq km/yr in 2013, India certainly does not qualify as one of the most intense extractive frontiers in the world. For instance, Australia had rates of metal extractivism of over 15 tons per capita in 2008 (Schandl et al., 2008); and per square kilometer extractivism rates of over 200 tons/sq km. in Chile, Jamaica, New Caledonia, Indonesia, and Uzbekistan, and between 140 -200 tons per sq km per year in Poland, China, Peru, South Africa, and Ghana (Schaffartzik et al., 2015). Odisha however, occupy at a significantly higher level than the rest of India vis-a-vis these rates in the recent past. Per capita metal extraction of Odisha was 2.11 tons per year in 2009, as against the comparatively low rate (on average) for India at 0.14 tons/pc/yr in 2009 (Table 5.1). Odisha also had an extremely high per square kilometer metal extraction of 569 tons/sq km/yr as compared against all India average which was at 57 tons/sq km/yr in 2009 (Table 5.2). In fact, the state of Odisha, which makes up about 3.5% of the total geographical area of the country, has consistently accounted for over 30% of metal extraction of the country since 2009, and accounted for close to 50% of metal extraction in 2013 (see Fig. 5.2).

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Major Metal Extraction* (thousand tons)</th>
<th>Per capita Domestic extraction of Major Metals (tons per capita)</th>
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<tbody>
<tr>
<td>2009</td>
<td>183318 (thousand tons) 88570 (thousand tons)</td>
<td>India 0.14 Odisha 2.11</td>
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<td>2010</td>
<td>162042 (thousand tons) 82599 (thousand tons)</td>
<td>India 0.13 Odisha 1.97</td>
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<td>2011</td>
<td>190996 (thousand tons) 75469 (thousand tons)</td>
<td>India 0.15 Odisha 1.80</td>
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<td>2012</td>
<td>230864 (thousand tons) 75420 (thousand tons)</td>
<td>India 0.18 Odisha 1.80</td>
</tr>
<tr>
<td>2013</td>
<td>241866 (thousand tons) 88996 (thousand tons)</td>
<td>India 0.19 Odisha 2.12</td>
</tr>
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</table>

Figure 5.4: Per capita extraction of major metals*- India versus Odisha: a) Total major metals; b) Iron ore; c) Bauxite; d) Chromite


*Major Metals (India) include bauxite, chromite, copper ore, iron ore and manganese ore; Major Metals (Odisha) include bauxite, chromite, iron ore and manganese ore
Area of India: 3,287,263 square kilometers; Area of Odisha: 155,707 square kilometers;
Table 5.2: Per square kilometers extraction of major metals- India v/s Odisha

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Major Metal* Extraction (thousand tons)</th>
<th>Per square kilometers Domestic extraction of Major Metals</th>
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<tr>
<td></td>
<td>India</td>
<td>Odisha</td>
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<td>Domestic extraction of Major Metals</td>
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<td></td>
<td>India</td>
<td>Odisha</td>
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<tr>
<td>2009</td>
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<td>2010</td>
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<td>49.29</td>
<td>530.48</td>
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<tr>
<td>2011</td>
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<td>75469</td>
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<td></td>
<td>58.10</td>
<td>484.68</td>
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<tr>
<td>2012</td>
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<td>75420</td>
</tr>
<tr>
<td></td>
<td>70.23</td>
<td>484.37</td>
</tr>
<tr>
<td>2013</td>
<td>241866</td>
<td>88996</td>
</tr>
<tr>
<td></td>
<td>73.58</td>
<td>571.56</td>
</tr>
</tbody>
</table>


*Major Metals (India) include bauxite, chromite, copper ore, iron ore and manganese ore; Major Metals (Odisha) include bauxite, chromite, iron ore and manganese ore

Area of India: 3,287,263 square kilometers; Area of Odisha: 155,707 square kilometers

Figure 5.5: Per square kilometer extraction of major metals* - India versus Odisha: a) Total major metals; b) Iron ore; c) Bauxite; d) Chromite


*Major Metals (India) include bauxite, chromite, copper ore, iron ore and manganese ore;
Major Metals (Odisha) include bauxite, chromite, iron ore and manganese ore
Area of India: 3,287,263 square kilometers; Area of Odisha: 155,707 square kilometers

Odisha also contributes significantly to export, with iron ore and chromite contributing the largest in terms of volume to exports (See Fig. 5 (a), and Fig. 5 (b)).
Figure 5.6: 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


One of the most significant extracted as well as exported metal in Odisha is iron ore. Between 1994 and 2009, iron ore production increased almost ten-fold from 7.9 MT/year to 79 MT/year in 2009.\textsuperscript{51} In 2013 iron ore production in state of Odisha, at 89 MT/year, exceeded the same for 8 of the 13 largest iron ore producing economies in the world, i.e., United States (52 MT), Canada (40 MT), Iran (37 MT), Kazakhstan (25 MT), South Africa (67 MT), Sweden (26 MT), Ukraine (80 MT), and Venezuela (30 MT) (Data source: USGS, Iron ore, 2014).

5.3 The iron ore extractive frontiers of Odisha

Within Odisha, the bulk of iron ore extractivism occurs in six districts—Keonjhar, Sundergarh, Anugul, Jharsuguda, Koraput and Mayurbhanj. Keonjhar and Sundergarh are the two most prominent iron ore rich districts, with the former accounting for close to 31% of the total iron ore reserves in Odisha as of 2010 (Pradhan and Patra, 2014). Keonjhar and Sundergarh also account for close to 71.1% and 25.5% of the total iron ore extracted in Odisha per year (Odisha Economic Survey, 2014-15). Keonjhar has witnessed a rapid pace of increase in production over the past few decades. For instance, in just four years between 2001 and 2005, the total number of mines in Keonjhar increased from 76 to 119—and increase of over 50% (Firoz, 2008). This district also accounts for the largest iron ore extraction. In 2013-14, the production of the district was 58 MT, implying that just a district surpassed many of the nation-states in terms of extraction. Additionally, back of the envelope calculations indicate that the district had an extremely high per capita iron ore extraction of 32.2 tons per capita, and of 6985 tons per sq km. In 2013-14, the district of Sundergarh—the second largest iron ore producing district in Odisha produced 19.6 MT iron ore, implying extraction of 9.3 tons per captia and 2018 tons per sq km.

Despite of the large quantities of metals extracted both districts have poor socioeconomic indicators. Although iron ore extraction in the state has been consistently increasing since 1994, Keonjhar ranked 27 out of the total 30 districts within the state in 2001 (Human Development Report, Odisha, 2004). Even after the boom in mining and the high iron ore prices since 2004, the districts continue to fare badly in terms of socioeconomic, and human development indicators. This can be evidenced by the fact that both districts fall within the 250 backward districts identified by the Backward Regions Fund Grant of the government of India (BRFP,

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52 At Census 2011 population of 1.8 million people.
53 Area of Keonjhar- 8,303sq km.
54 At Census 2011 population of 2.1 million people.
55 Area of Sundergarh-9712 sq km.
Letter dated 6th of February, 2016 from the District Collector, Keonjhar to the District Rural Development Agency, Keonjhar shows that as of 2016, out of the total 45960 households in the mining affected blocks of Jhumpura, Joda, Hatadili, Banspal, and Harichandapur in Keonjhar, 23006 still require to be converted into ‘Pucca’ Houses (District Rural Development Agency, 2016). Further, as per the Odisha Economic Survey, 2014-15, about 6% of the local population gets employment from the mining industry.

Large quantities of iron from the state are sold to industries outside the state, thus resulting in the state serving as an intra-national extractive frontiers. Odisha thus ends up serving as a supplier of raw materials to industries outside the state, resulting in a situation similar to a global extractive frontier, but at a national level. As such, iron ore from Odisha is supplied to different industries across India and the world, whereas industries within the state face a situation of shortage of supply. In recognition of this problem, the Government of Odisha, through an Executive Order on the 5th of December, 2012, directed mining lease holders within the state to reserve at least 50% each of lumps, and fines extracted in the state, which have not put to captive use by leaseholders, for sale to stand alone mineral based industries within the state. This Executive Order was challenged by mining companies but was held valid by the High Court of Odisha of the state government dated 2nd April, 2014 (The Odisha Gazette, 2014). The official notification released on the 26th June, 2014 further specifies that the sale of this reserved quantity is to be “limited to the requirement of such user industries (stand-alone mineral based industries within Odisha), in an equitable manner, on payment of the prevailing fair market price by the user industries to the mining lessees” (The Odisha Gazette, 2014).

Given the high volumes of extraction of metals within the state, the per capita extraction rates, as well as the per sq km extraction rates as compared to the rest of India, Odisha can be said to serve as a metal extractive frontier within India, and will likely do so in the near future given that it has a large stock of resource, and since state government policy continues to promote mining (Odisha Economic Survey, 2007). The Backward Regions Fund Grant of the Central Government was launched in 2007 in order to address “persistent regional imbalances in development”. http://pib.nic.in/newsite/efeatures.aspx?relid=79312 (Last accessed 7th February, 2017).
2013-14). This can also be observed from the website of the Government of Odisha’s Department of Steel and Mines’ Business Environment subsection which states:

Iron ore deposits could well be Orissa’s passport to a bright future. With the upswing in the global demand for steel, which is obtained after the reddish-grey ore is put through a blast furnace, Orissa is the toast of the country and perhaps the world... With the global demand for steel growing, the Union Cabinet recently unveiled a new steel policy that seeks to shore up the per annum steel production from 38 million tonnes to 100 million tonnes by 2019-20. But going by the current rush for iron ore in Orissa, the country may achieve the target well before the deadline. The State Government assigned 49 MoUs with various domestic and foreign companies for production of more than 75 million tonnes of steel in the state thereby bring(n)ing investment to the tune of 198,149 crore rupees. Similar MoUs have been signed by the state Government for alumina-aluminium and cement projects in the state. (Government of Odisha, 2017)57

In the following section, some characteristics of extractivism in Odisha are explored to determine whether the region can be categorized as suffering from predatory extractivism.

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

As is well known, mining is not an environmentally benign activity. However, it is often justified on the ground of social and economic benefits that the industry is supposed to bring forth. Based upon secondary literature, and semi-structured interviews with relevant stakeholders, and observations from the field, the following environmental, social and economic implications of extractivism at extractive frontiers are presented.

5.4.1 Economic Implications

Outside of contributing to the State exchequer in the form of royalties, continued presence of extractive industries can have a range of negative economic implications which in turn can have a serious impact on the long term economic sustainability for local communities. As per calculations made by the Justice M. B. Shah Commission, given the quantities of ore extracted and the prices of ores,\(^{58}\) even if 10% of average annual income from iron ore extraction for the eight years between 2004–05 and 2011–12 (which would account for almost 2500 crores), was actually “utilized for basic facilities (drinking water, roads, hospitals, schools etc.)...the Districts would be par excellence for stay and would be equal to well-developed Districts of any developed States” (Justice M. B. Shah Commission Report, 2013, p. 105).

In order to address some of these concerns, the Mineral and Metal (Development and Regulation) Act 1957 was amended in 2015. One of these include the creation of District Mineral Funds (DMF) for district development and welfare activities at a smaller scale. As per this new rule, starting 2015, every mining lease holder is obligated to pay a sum, not exceeding one third of the total royalty collected by the State government, as per the royalty rates set by the Central Government.\(^{59}\). Given the current royalty rates of 15%, this would mean that, for instance, given the total value of mineral production in Keonjhar in 2004-05 (which was about 767 crores), the royalties collected by the State government would be close to 115 crores per annum (0.15 X 767), and the royalty collection by the district fund would be about 38 crores per annum (767/3). At the much higher volumes of extraction and value generation in 2011-12, which was 11984 crores, the DMF would have acquired royalties close to 600 crores per annum. The creation of this fund is a step towards redistribution of the economic benefits of mining by enabling direct collection of royalties at the district level. However, even at the current levels, mining corporations continue to make “super normal profits”.

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\(^{58}\) In the year 2009-10 when mining peaked, at 80 MT, given the high iron ore prices then, and the high quality iron ore of Odisha, the value of ore in that single year from the two districts was close to Rs.35,082.57 crores (Justice M. B. Shah Commission, 2013).

\(^{59}\) For further details see: http://dmf.orissaminerals.gov.in/website/aboutus.aspx
In the iron ore mining belt of Odisha, economic implication of mining include, but are not limited to the following.

5.4.1.1 Illegal mining: One of the most significant outcomes of the large scale extractive industries in the region has been proliferation of illegal mining. The extreme wealth and power concentrated in the hands of mining corporations however, entails that even when illegal operations are detected, large corporations can avoid too much opposition from local and state level governmental actors and agencies. For instance, Bera notes that,

Despite the findings, many violators, especially big companies, got away without any hassle...Tata Steel, for instance, renewed its mining lease and increased production capacity from six million tonnes to 12 million tonnes in a year even when the Divisional Forest Officer (DFO) of Keonjhar had slammed the company for violating forest laws and illegal mining in 2011. Similarly, Rungta Mines renewed its lease despite violations. The DFO was transferred after he filed damning inspection reports (Bera, Down to Earth, 2012).

The scale of illegal operations was so large between 2004-05 and 2019-10 that in 2010 the central government appointed a Commission of Inquiry—the Justice M.B. Shah Commission, to explore the nature, extent, and cases of illegal iron ore and manganese operations within the state. The Justice M.B. Shah commission published its first Volume on illegal iron and manganese ore operations in Odisha in 2013 which provided the first comprehensive account of the scale of illegal operations being undertaken in the region. The state government, prior to the visit by the Commission, issued notices for illegal mining operations indicating its willingness to take action against these operations. Indeed, 146 illegal mining operations were issued notices for excess production of iron ore by the state government prior to the visit of the Commission to Odisha in 2012. The notices for recovery of cost of excess production for the 4 mines in Keonjhar accounted for more than Rs. 1064 crores and the 11 in Baripada for Rs. 467 crores (Justice M. B. Shah Commission, 2013, p. 129-130). Of the total 192 mining leases granted, 53 mines were found to be operating without Environmental Clearances.

Of these, 33 were in Koida, 62 in Joda, 11 in Baripada, and 4 in Keonjhar.
5.4.1.2 Dependency on corporations: The Government of India and the state government have certain responsibilities towards tribal communities within the tribal dominated regions,\(^6\) which they often fail to provide. Often, extractive agents use this gap left by government to contribute to small development related projects for their Corporate Social Responsibility (CSR) activities and utilize these as a proof of contributing towards the welfare of local communities. This includes opening local schools, hospitals, mobile first aid or vaccination centers, services for supply of bottled water, etc. However, these are ‘development related activities’ (see footnote 13) under the ambit of government responsibilities and should be provided before allowing extractive industries to establish if not irrespective of their presence. As the then Union Minister for Tribal Affairs and Panchayati Raj, Kishore Chandra Deo stated: “It’s been suggested portions of mining companies’ profit be spent on tribal community development – but why should we be dependent on a company's declared profits?” (Times of India, 18th March 2013).

Significant proportion of population in both Keonjhar and Sundergarh belong to 'tribal population' category as per the 2011 Census: 46% (Keonjhar) and Sundergarh (56%) (Justice M. B. Shah commission Report, 2013).

\(^6\) The Commission brings out this issue and highlights provisions of Section 3(2) of the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 which mandates the Central Government to provide various facilities within Scheduled Areas. The Section states:—

Notwithstanding anything contained in the Forest (Conservation) Act, 1980, the Central Government shall provide for diversion of forest land for the following facilities managed by the Government which involve felling of trees not exceeding seventy— five trees per hectare, namely:—(a) schools;(b) dispensary or hospital;(c) anganwadis;(d) fair prices shops;(e) electric and telecommunication lines;(f) tanks and other minor water bodies;(g) drinking water supply and water pipelines;(h) water or rain water harvesting structures;(i) minor irrigation canals;(j) non—conventional sources of energy;(k) skill upgradation or vocational training centres;(l) roads; and (m) community centres.

Provided that such diversion of forest land shall be allowed only if: (i) the forest land to be diverted for the purposes mentioned in this sub—section is less than one hectare in each case; and (ii) the clearance of such developmental projects shall be subject to the condition that the same is recommended by the Gram Sabha (Justice M.B. Shah Commission, 2013, p. 110).
The dependencies that are created by mining corporations in the region were revealed in an interview with the head of a prominent NGO working towards tribal welfare in villages in Keonjhar which do not directly fall in the iron ore mining belt. The concerned individual, who has requested anonymity informed us that they secretly wish mining activities, which were largely on hold owing the ban on various large corporation as a result of the Commission’s report, would resume as soon as possible. This was surprising given that the impacts on adivasi welfare were evident to the concerned individual, and given their commitment to the adivasi communities. He explains that most of the funding for conducting their operations from corporations such as Rio Tinto, and Aditya Birla. With the ceasing of mining operations, the source of funding are at risk. The people in the villages desperately need help, and require support for managing their primarily subsistence agricultural activities. The Juang people living in such villages lack access to electricity, clean water; and although mining results in all kinds of environmental problems, and the industry remains as the largest source of funding. He states that every month of the mining ban has implications on their activities, and by association on the daily lives of the Juang people (paraphrased from interview, and translated from Hindi).

5.4.1.3 Abandonment of agricultural activities: The monoproductive nature of extractivist industries incentivize abandonment of alternative professions, create dependencies and eventually result in dis-incentivization of economic diversification. Bera describes similar processes occurring in Keonjhar where, “[b]eginning 2002, with the boom in mineral prices, people abandoned agriculture—everyone wanted a share of the booty, either by illegal mining or by transporting the iron ore. Most areas now lie barren. With streams dried up, people depend on tankers from mining companies for drinking water” (Bera, Down to Earth, 2012). Given the economic appeal of integrating into the extractive ecosystem, the socio-economically stronger sections of society have already invested in trucks for ore transportation. The socio-economically weaker sections of society are then employed, often informally, as truck drivers. A study of 600 households in Keonjhar in 2010, indicates that on an average, 1 people every two households are employed as daily wage laborers in mines, whereas in Keonjhar block this figure averages around 1 person per household (Pattnayak et al., 2010). Discussions with truckers (under conditions of anonymity) through semi-structured interviews provided
insights on the working conditions of several hundred truckers in an active iron ore mine 
in the region: long hours of waiting to receive consignments of ore, close to continuous  
20 hours of working schedules, and the health impacts due to constant exposure to ore. 
Given the informal nature of employment, truckers are paid as per loads transported. 
Since everyone attempts to maximize the amount of ore they transport, this results in 
overburdening each truck, and taking up multiple and continuous shift thus resulting in 
grueling hours of travel time. Additionally, since the quantity in tons transported is the 
criteria of payment, truckers often work several days at a stretch getting, a few hours of 
sleep (many sleeping whilst awaiting their turn in long queues of trucks). This is often 
done in order to earn larger sums of money, but also because of competition between the 
thousands of disposable truckers. As per one trucker, the occupation pays significantly 
better than those offered in agricultural activities—an average trucker can make upto 
30,000 INR per month. This incentivizes the local male youth in the villages to undertake 
ore transportation. Interviewees also indicated that stressful working conditions, and 
continuous breathing of iron ore dust, is perceived to result in reduction of life 
expectancy of truckers. In its effects on skilling, extractivism has resulted in many local 
youth learning how to drive, thus giving them employment opportunities as drivers. 
However, once the mining operations cease, this can result in sudden loss of 
employment. Given the current permissible limits for extraction of up to 154.263 MT/ 
year granted by Indian Bureau of Mines (IBM), and Ministry of Environment, 
Forests, and Climate Change (MOEF CC), it would take only 30 more years to extract 
all of the iron ore from Odisha—an estimated 4704.263 MT of good quality iron ore 
(Justice M. B. Shah Commission, 2013).

5.4.2. Environmental implications

The cost-shifting of negative environmental externalities of onto local populations 
has been observed to be a common occurrence in mining operations in Odisha 
(Vasundhara, 2008). Some examples follow in the next section.

5.4.2.1. Water pollution: Mining activities have had severe implications on access 
to water, and water pollution in the mining belt of Odisha. The M.B. Shah commission 
reported the following: “We have seen some women fetching water from dirty
“nalas”; (culverts or streams). Upon making inquiry with them, it was found that there is no well from where drinking water can be fetched.” (ibid., 2013, p. 52). Apart from direct pollution of water sources, mining activities also result in damaging the source of water, which are often close to mines. The iron ore rich Keonjhar and Sundergarh districts lie in the catchment of the Baitrani (Vaitarni) River—one of the six major rivers flowing through Odisha (see Figure 5.7).

Figure 5.7: River systems of Odisha


A large section of the network of the 65 tributaries and many nalas joining into this catchment area used to lie within the region covered by these two districts. Extractivism in the region has resulted in the disruption of these water channels
resulting in impacts on availability of water resources for downstream villages. The Commission pointed out to this degradation of water channels and states: “The networking of water channels and small *nalas* which were originating from the hill tops and heavily forested slops are now completely shattered due to large mining pits, dumps, roads and other mining activities” (Justice M.B. Shah Commission, 2013, p. 52).

Analysis of Water Quality Index\(^{62}\) of samples from 13 locations across the Baitrani between 2010 and 2012, indicated that only 7.7% of Baitrani samples analyzed were of good quality\(^{63}\) during the pre-monsoon season, and none in the post-monsoon season. Further, the WQI indicated that in the pre monsoon season, 54% of the samples were of poor quality, 31% were of very poor quality, and 7.7 % were of unsuitable quality. In monsoons, 61% were of poor quality, 31% were of very poor quality, and 8% were of unsuitable quality. In the post-monsoon season 46% were of poor quality, 46% were of very poor quality, and 8% were of unsuitable quality. None of samples were of excellent quality (Dash, Das and Mishra, 2015).

Additionally, surface water pollution impacts health of local villagers who have no options outside of consuming the polluted water (Vasundhara, 2008). For instance primary data collected for a study conducted in the Banspal block of Keonjhar district, where mining is the primary occupation, indicated that in the year 2013, the incidence of people suffering from water related diseases was extremely high. Over the year 2013, 40.93% of the total population in the region suffered from Malaria, 14.21% from various water borne diseases such as loose stool, cholera, and diarrhea etc., 4.16% from typhoid, and 0.24% from Jaundice (Pradhan and Patra, 2014). Mining operations very often also draw water illegally from local surface water sources, resulting in the depletion and degradation of water sources. In an interview

\(^{62}\) The Water Quality Index calculations included 14 parameters related to water quality. These included pH, turbidity, dissolved oxygen(DO), biological oxygen demand(BOD), total dissolved solids(TDS), total suspended solids (TSS), total hardness (TH), Ca\(^{2+}\), Mg\(^{2+}\), total Fe, Cr, Cl\(^{-}\), SO\(_{4}\) 2\(^{-}\), and NO\(_{3}\). The standards for suitability of water used was as per Bureau of Indian Standards (BIS), and World Health Organization (WHO) Standards (Dash, Das and Mishra, 2015).

\(^{63}\) Depending on the WQI values obtained, water quality is classified into five categories: excellent (WQI<50), good (50-<WQI<100), poor (100-<WQI<200), very poor (200-<WQI<300), and unsuitable (WQI>300) (Dash, Das and Mishra, 2015).
on 09th June, 2016, in Keonjhar city, the co-founder of the Keonjhar Citizens’ Forum—a citizens group working towards raising awareness among district officials regarding the impacts of mining—Lieutenant Kiran Shankar Sahu, stated that “Baitarani river is being used to transport slurry...The situation is such that there is 75% water and 25% slurry in the river.”

5.4.2.2 Air Pollution: Iron ore mining operations result in immense air pollution, with entire villages being completely covered in red dust. Bera (2012) captures the realities of the air pollution generated in Keonjhar: “At the entrance to the Koiru block development office is a signboard listing its success profile—from check dams and farm ponds to peripheral development. It’s telling: there are no numbers on the white board, only a coat of red iron ore dust” (Bera, Down to Earth, 2012).

The imposition of this wide range of environmental externalities onto local villagers is acknowledged by the Commission in its report:

Members of the Commission have observed that all along the roads which are passing from and to the villages, on both sides about 150 mtrs, there is widespread dust pollution and thereby the trees are covered with fines matching with colour of the minerals. From this situation, one could imagine the fate of the villagers who are residing in these areas. They are forced to breathe polluted air and suffer with air born diseased lifelong...It is unfortunate state of villagers’ life. Because prior to mining operations, the tribals were breathing fresh and nonpolluted air and drinking clean and nonpolluted water from the streams/ rivers (Justice M.B. Shah Commission, 2013, p. 254-255).

For instance, in Banspal block of Keonjhar district, 28.92% of population was found to have suffered from ARI (Acute Respiratory Infection) in the year 2013 (Pradhan and Patra, 2014). Additionally, results of an analysis of 600 households in Keonjhar indicate that while incomes of households closer to mines being high, these households also experience higher incidences of various illnesses, own lesser land and assets for agricultural activities, and rank lower on human development indicators than households further from mines (Pattanayak et al, 2010).

A study of the air quality in 2008 and 2009, in 6 villages across Joda to Malangtolli, in the Bamebari- Kalimati and Dubuna area found that Suspended Particulate Matter (SPM) concentration was 495 and 639 ug/m³ which is much higher than the CPCB...
standards of 200 ug/m³ (for Residential, Rural and other areas). Respiratory Particulate Matter (RPM), 201 and 257 ug/m³ which is much higher than the CPCB standards of 100 ug/m³ (for Residential, Rural and other areas) (Sahoo and Behera, 2013).

In another study, it was found that a measuring station in Bhadrasahi, which was located close to the Bhadrashahi Chowk—a junction which experienced the highest movement of trucks, during 2008-09, reported SPM concentrations ranged between 1595 ug/m³ and 2713 ug/m³, and RSP between 278ug/m³ and 650 ug/m³ (Panda et al., 2013). In another measuring station in Beleipada which was located at a distance of 500 meters from NH-215, and 2 kms from the Tata Sponge Iron Ltd., and Balita Iron Ore Mine, reported SPM concentrations ranging from 934 to 1023 ug.m³ and RSP concentrations of 336 ug/m³ and 419 ug/m³ (Panda et al., 2013).

5.4.2.3 Management of waste generated from extraction: An insight into how little attention the management of by-products of the mining industry receives from the government, corporations, contractors and other involved parties is captured by a Bhubaneshvar based economist Mr. Panda, who describes that: “for the 80 million tonnes of iron ore produced in 2010-11, the environmental cost of handling overburden (waste produced while mining) would be Rs 26,000 crore. This is absurd since the market valuation of 80 million tonnes is less than Rs 10,000 crore” (Bera, Down to Earth, 2012). Interviews with various local people revealed the concerns that people have with the waste dumps. In an interview with a local lawyer, Mr. Sudhanam S. Panda on the 10th of June, 2016 in Keonjhar city stated that “the mining dumps (in various locations) are over 20 ft tall” (translated from Hindi). Mining waste affects surrounding regions, especially during monsoons when waste run-offs enter downstream areas. The extent of land rendered unproductive due to mining operations can be gauged by the land use change patterns in Joda block which show that between 1989 and 2004, when mining operations expanded from 1646 ha to 2807 ha, the waste land increased from 8295 ha to 18541 ha, forest cover reduced from 36192 ha to 24501 ha, and agricultural land decreased from 22128 ha to 21521 ha (Vasundhara, 2008).
5.4.3. Social implications
Mining is commonly promoted on the basis of enhancing the per capita incomes, human development indicators, and to bring about social progress in regions of extraction. However, there are many negative implications of extractivism which are usually not taken into account, and which have serious implications on the daily lives of local communities. Some of these have been explored below.

5.4.3.1 Impacts on wildlife, and generation of man-animal conflicts:
Mining operations affects the daily lives of people significantly through creation of man-animal conflicts. Because these regions are densely forested regions, they tend to have a large fauna; for instance the forests (Sanctuary, 2011) in Odisha serve as elephant and tiger corridors. This impact the lives of villagers due to injury and threat to life, and damage to fields. Further, injuries and death of wildlife is another important aspect of this problem. For instance, over the past decade, increasing pressure of encroachment into habitats of wildlife have resulted in increase of incidents of man-animal conflicts. Estimates show that between 2001 and 2007, 365 people were killed in elephant attacks in Odisha. Maximum number of these deaths were recorded in Keonjhar, closely followed by Sambalpur and Sundargarh (Palita and Purohit, 2008). Over the same time period (2001-2007), over 23,241 acres of paddy cultivation was estimated to have been damaged due to elephants (Palita and Purohit, 2008).

The primary cause of the recent increase in man-animal conflicts has been ascribed to habitat loss and fragmentation, as well as alteration of elephant corridors (Mishra et al., 2015; Sahu and Das, 2012; Palita and Purohit, 2008). The then Principal Chief Conservator of Forest (Wildlife) S.S. Srivastav states that “Mining is one of the major reasons for death of elephants in the state. We want industrialisation and progress, but it should not be at the loss of wildlife.” (Dehury, 2014).

Apart from the large scale deforestation activities and resultant habitat fragmentation, which are often associated with mining activities, elephants are impacted by ore transportation activities (Vijayalakshmi, 2012). For instance, according to a report by Down to Earth in 2012, a train passes every 13 minutes through the critical forest regions of Keonjhar district. Between 2010 and 2013, at
least 14 elephants died due to train related accidents (Vijayalakshmi, 2012). The Commission located the presence of 31 iron ore and manganese mines as being “adjacent to projected elephant corridor in Sundargarh and Keonjhar Districts. The result thereof is vast destruction of standing crops, huts and human habitats by the elephants, as observed” (Report of Justice M. B. Shah Commission, 2013, p. 254).

5.4.3.2 Repression of activists: Local activists who have any anti-mining sentiments face much harassment, and intimidation by mining mafia. Interview with a local independent activist, Bhaktji, on the 8th June, 2016 in Keonjhar city revealed that he and his team have been apprehended and physically abused on several occasions owing to their anti-mining stance. According to an interview held in Keonjhar city on the 9th June, 2016, an active member of the civil society, Lieutenant Kiran Shankar Sahu, expressed his personal opinion regarding the mining agents in the region stating that they “have strong vested interests in keeping local people poor, uneducated and sick”.

Mr. Sahu, who owns a small mine himself, has been rather concerned with the scale of operations of large mines, the rampant illegal operations, ecological degradation and plight of local villagers. Mr. Sahu, along with other concerned citizens have formed a group called the Kendhujhar Citizens’ Forum to bring forth these issues before the local district administration. However, according to Mr. Sahu, although the group is given attendance and acknowledged by local authorities, action against mining interests is not taken.

5.4.3.3 Tight vigilance on non-local people: Based upon experience on the ground as well as from various semi-structured interviews, the local police, mining mafia, and other actors related to the extractivist industry keep a very tight vigilance on the people entering the region, especially if they are not related to the mining industry. This was evidenced by the fact our local hosts received phone calls questioning the motives of our visit within a few hours of our arrival at the Keonjhar bus station. Various interviews had to be conducted late at night when the arrival and departure of interviewees would be more difficult to notice. While travelling across various villages in Joda-Badbil, specific instructions were given to us as to not reveal any anti-mining sentiments to any stranger in the region for fear of intervention by
the mining mafia. An interview on the 9th June, 2016 in Mayurbhanj, with a local tribal couple collecting forest produce in the middle of a forest area sanctioned for iron ore mining to Odisha Mineral Corporation (OMC), resulted in questioning and harassment by local security personnel hired by OMC. Discussions regarding environmental injustices of local mines with affected villagers eventually culminated in intimidation and death threat by local mafia. This situation makes it extremely difficult for researchers, journalists or any other actor from outside the region to even contact the affected villager, leave alone documenting their opinion on mining, for the threat to the life of both external actors and villagers. This enables an environment of suppressing the information, if not silencing—on the conditions that local people live in under the threat of agents of extractivism—from leaving the region.

5.4.3.4 Influx of migrant labor and prostitution: Extractivism opens up sudden opportunities for short term informal employment. This leads to a sudden influx of migrant labor from nearby regions and states. According to Bhaktji, migrant workers from Bihar, Jharkhand, and even Punjab and Haryana moved into the Joda-Badbil in large numbers during the iron ore mining rush which began in 2004. Given that mining operations are largely mechanized, these people worked only as truckers and not within the mines—an activity that enjoy a high demand for ore transportation. As of 2011, at least 50,000 trucks per year were engaged in transportation of iron ore (Kumar and Kumar, 2015). According to Bhaktji, the migration has displaced the locals from this occupation to such an extent that it is difficult to find any Odia speaking trucker—. “Even tea stalls, and hotels have Hindi names now”, he stated. The linguistic changes have serious implications on the loss of culture in the region and often push local villagers—who may not be familiar with Hindi and are consequently left outside predominant social interactions.

The influx of laborers also necessitated accommodation facilities for the newly migrated population. Towards this end, mining agents illegally acquired spaces for ‘peripheral development’ and created temporary shanty settlements. These

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64 For further details of the case, see Bisht, 2016. Talc, the widowmaker of Madarangajodi. [http://www.unevenearth.org/2016/09/talc-the-widowmaker/]
settlements are referred to as “huttings” by local people. For obvious reasons, iron ore huttings do not provide adequate living conditions. Discussion with a local extrucker, Mr. Alok, were carried out over a period of two weeks from 8th till 18th June, 2016 to better comprehend the living situations, as well as the impacts of iron ore mining on truckers. Mr. Alok, a 23 year old resident of Mayurbhanj district moved to the Joda-Badbil circle for employment opportunities to enhance the income of his family. His family is primarily occupied in subsisidence agriculture, the income from which supports a family of seven, including aged parents, his brothers’ family. In order to support his family, Mr Alok started driving trucks for ore transportation at the age of 18, and carried on until the age of 22 when he got married and the living situation in the hutting (including alcohol consumption and prostitution) lead him to quite the profession. He describes these settlement as being “made of mud, plastics and loose tin roofs, where tens of people live in a single room, with no adequate cooling facilities even in the exceedingly hot summer temperatures, and lacking sanitation facilities”. The presence of these huttings, and the socio-economic conditions of local adivasis, do incentivize prostitution by women. Discussions with multiple local sources indicate that locals perceive that a mixture of the presence of large numbers of migrant truckers—who earn much larger sums of money than agriculturalist villagers, and the socio-economic conditions of displaced, disposed or affected tribal villagers’ incentivizes prostitution among local women.

5.4.3.5 Induced complacency of local villagers: Despite of the large scale of operations, and the multiple negative externalities generated, there is a lack of active protests or resistance against iron ore mining in the Joda Badbil and Koirar circles. From semi-structured interviews with various stakeholders, it emerges that the strategy employed by agents of extractivism here varies significantly from that of direct harassment, intimidation and repression often employed in the pre-extractivist stages.65 The local extractive agents prefer to tempt the local villagers with monthly ‘stipends’ of up to 2000 INR per month in order to buy their compliance. The most

65 In many other regions where large scale metal mining in prevalent, there is the involvement of mining mafia, direct harassment, and employment of other forms of harassment. These have been explored in detail in Chapter 3 on Iron ore mining conflicts and ressistance movements in India.
commonly heard case on the ground that of the local MLA (Member of Legislative Assembly) Sanatan Mahakud—whose personal declared wealth grew by an astonishing 1700% (from 3 crores to 51 crores) between 2009 and 2014. Interviews with various local people corroborated (Rajshekar, 2015) that Mahakud makes a monthly payments, across each village which falls in the Joda-Badbil circle, to each local villager above 18 years of age a sum of 1000-2000 INR per month.

According to a local lawyer (anonymous on request), informed us that mining represents easy money for the local people given the supply from Mahakud, as well as from various mining corporations. He pointed out that almost every house in the villages in the region has a large SUV, however they don’t have sanitation facilities, and “go to the toilet in the river”. We have verified such presence of large cars and absence of toilets through our visits to a significant number of houses in Joda, and Badbil. We also observed numerous people routinely defecating and urinating in the river. This can be corroborated from data in the letter from the District Collector, Keonjhar to the District Rural Development Agency, Keonjhar which shows that in the mining impacted regions of the district, out of 45960 households (in mining impacted blocks Jhumpura, Joda, Hatadili, Banspal and Harichandanpur), 34684 require the construction of toilets (DRDA, Keonjhar, 2016).

According to another source, “there is economic growth but no social progress in the region”. People have a lot of money but do not invest the same in any productive enterprises but either choose to “store them in their cupboards”, or “buy cars, motorcycles, fridges and television sets”. The choice of expenditure also indicates something about the gender bias in the region. Money is commonly observed to be invested in tools that allow mobility, ease of access, or comforts to male members of society. However, education, sanitation, healthcare—issues that are more prominently of concern to women either personally or for their children, are neglected.

Another notable case is that of a local tribal leader who has been leading the tribal cause against extractivism since 2007. According to a local activist, as well as a local journalists, the tribal leader has been receiving monetary compensation from the mining corporations, for the past few years as well as recognition from the state and
central governments, in return for her compliance with extractive industries. Local interviewees (who wish to remain anonymous) reveal that contributions from the corporations to make her to the mandatory public hearings (before the initiation of mining projects) in their favor. An interview with an influential person associated with the mining industry, revealed that “if we don’t pay there is no way a public hearing will clear a project. They have a lot of influence in the region. In order to get any clearances, it is paramount that we get their support” (translated from Hindi). However, this indicates the larger system at play—that of corporate interests buying out local tribal leaders in order to suppress any social mobilization or resistance against expansion or continuance of extractivism.

This lack of mobilization and anti-mining resistance in the established Joda-Badbil-Koira iron ore mining belt, is in stark contrast to anti-mining movements in other parts of Odisha such as the resistance against bauxite mining in Niyamgiri hills, in Koraput and Kalahandi districts, and the anti-bauxite movement in Kashipur districts of the south-western Odisha, or the anti-POSCO resistance in the Kandhahar hills.

5.5 Conclusions

Analysis of trends and patterns of extractivism and comparison of the same against India and various major extractive economies around the world, indicate that Odisha is a metal extractive frontier on the basis of the per capita, as well as per sq km. Odisha, and more specifically certain resource rich regions within the state serve as extractive frontiers, producing primary commodities and raw materials for productive industries located outside the regions of extraction.

One of the most valuable products of extractivism from the state is iron ore. Analysis of the iron ore mining belt of north-western Odisha, which includes the districts of Keonjhar and Sundergarh indicate the extremely large extractivism within the region in terms of absolute volume, per capita tonnage extracted, as well as per sq. km tonnage extracted, indicating metabolic patterns similar to extractive economies around the world.
Decades of extractivism have resulted in acceptance of, and integration into the extractive ecosystem by many local villagers. Although villagers suffer myriad economic, social and environmental consequences of extractivism, they have found a convenient source of money: indirectly through employment (trucking), and directly by obtaining monthly stipends from various agents of extractivism. This has induced compliance of villagers, as well as creates auxiliary dependencies on mining operations. This has meant that the social mobilization against iron ore mining in the north-western belt is very limited. This lack of mobilization in established mining belts, is in stark contrast to the strong social resistance movements during the preliminary phases such as during the proposal of sites of mining operations. Some examples of this include the resistances against bauxite mining in Niyamgiri hills, in Koraput, Kalahandi and Kashipur districts of the south-western Odisha, or the anti-POSCO resistance in the Kandhahar hills in Sundergarh district.

The iron ore mining belt of Odisha also presents features of predatory extractivism, with cost-shifting of negative environmental externalities of extractivism onto local populations. However, the dependencies that have been created on mining in the region are quite strong. If extractivism in the region suddenly ceases, which it is inevitable given the non-renewable nature of iron ore, this would have major implications on the lives of the thousands of people who have invested in the mining ecosystem.

As such, any strategies for exit of, or ceasing of the extractive operations necessitate the acknowledgement of, deliberation upon, and careful management of environmental, economic, and social ramifications of extractivism. As a response to the low development status of the state, currently the government proposes further increasing mining in order to enhance revenue generation. The cited end goal of this strategy is to enhance living conditions, generate diverse employment opportunities, and increase the annual per capita incomes of people within the state. However, with regard to operationalizing further mining, it is important to take into the grounds of predatory extractivism that are already being witnessed and to seek alternative development pathways for a socially, and ecologically viable progress for the local communities.