

# Mining and Sustainable Development: A Case Study of Keonjhar, Odisha

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## Abstract

Mining is essential for the economic growth of a nation. Although mining is seen as an extractive sector, it can be a partner in achieving the Sustainable Development Goals. Odisha contributes the largest value of mineral production (excluding fuel oil and atomic minerals) in the country. It is endowed with rich mineral resources with a variety of metallic and non-metallic minerals that include Chromite, Bauxite, Graphite, Iron-ore, Manganese ore and many more. The mining and quarrying subsector contributed 8.29 per cent of state GVA (relative to 2.26 per cent at the all-India level) as per the advance estimates (AE) for 2021-22 at current prices. In terms of reserves in India, Odisha accounts for 96 per cent of Chromite, 92 per cent of Nickel, 51 per cent of Bauxite, 33 per cent of Iron ore, 43 per cent of Manganese ore and 24 per cent of Coal reserves in the country. Government of India has formulated Pradhan Mantri Khanij Kshetra Kalyan Yojana which is implemented by the District Mineral Fund (DMF) using the funds accruing to the DMF. These funds are used for the welfare of persons and areas affected by mining related operations. The DMF offers an opportunity to correct this historical injustice. It recognizes the right of people to benefit from the land and its natural resources, traditionally held by them either individually or as a community. DMF Keonjhar is largest DMF in the country. In its current state, DMF accrual will only flow from the extracting companies to the various departments of the Government, without passing through the hands of the citizens. It is proposed that all or part of the accrual be invested in an Alaska-type permanent fund and an annual dividend from the investment be transferred directly to citizens, so that they can decide how it is to be spent. Mineral wealth need not be a curse. It can even be a blessing, provided the right measures are taken to transform it into sustainable development.

**Keywords:** Mining, Minerals, Socio-economic development, DMF, Basic Income, Wealth Fund, Keonjhar, Odisha, India.  
**JEL Code:** L71, L78, O14, Q01, Q32, R11, R58.

## Introduction

### Mining and Sustainability

The famous physicist Max Planck said, however: Mining is not everything but without mining everything is nothing.

Although mining is seen as an extractive sector, it can be a partner in achieving the Sustainable Development Goals. The fact that it harnesses directly the natural resources for its operation makes it all the more an antithesis to the

concept of sustainability. So, the question which arises is if the mining activity sustainable and if yes how?

The clearest definition of the concept of sustainable development is included in the 27 Principles of Sustainable Development contained in a document signed at the Earth Summit, held in 1992 in Rio de Janeiro. The three pillars were of economic growth, protection of natural resources and environment and social responsibility towards the various stakeholders.

Sustainability or sustainable development is not a static phenomenon but an ongoing dynamic process. To a layman, sustainability talks about only protecting the environment and hence in mining it means how to take care of the ill effects of mining on the environment but in reality it is a broader concept. It should also focus on the social aspects which is about the society or the local communities which are directly or indirectly affected by the mining activities.

**Literature Review**

Mining is essential for the economic growth of a nation. It provides the raw materials for the various industries in the first go. It provides revenue which helps in opening new opportunities for economic prosperity. There are several counterviews about the mining sector. To start with the popular Singer Prebisch Hypothesis which says nations which produce primary products will give a deteriorating term of trade in the long run and hence as mining comes into this category will eventually make the country worse in terms of declining growth. Then comes the Dutch disease argument which says the focus on mining sector would lead to more exploitation of nature, neglecting of other sectors and ultimately making the mining sector more prone to shocks.

Mining plays an important role in the development process by converting mineral resources into a form of capital that contributes to a nation’s output (Davis and Tilton, 2005). Thus exploration of mineral resources is an essential condition for successful economic development of an economy (Bogdetsky et al., 2005; Mensah, 2011).

However, even though mining activities provide an impetus for economic growth and development, they are also responsible for a host of adverse impacts, foremost degradation of the environment and natural resources (Mishra, 2009; Li et al., 2011).

Evidence of imbalance in the distribution of mineral resources is found in earlier studies. It is recognized, for instance, that a deficit exists in the access to electricity by a significant part of the population from parts of Latin America, Sub-Saharan Africa, China, and India, among others (Dubinski, 2013). In contrast to that, a positive correlation has been reported between the exploitation of mineral resources and the economic growth in some countries such as Chile, Indonesia, Botswana, China and India, being the last two the greatest responsible for the significant increase in the rate of exploitation of minerals that started in the 1980s (Dubinski, 2013 and Horsley, et. al. 2015).

**Mining Contribution to Odisha Economy**

The industry sector has four sub-sectors namely, mining & quarrying, manufacturing, electricity-gas water

supply & other utility services, and construction. The size and growth rate of these sub-sectors are critical for the growth of GSDP given Industry’s share in overall economy.

Odisha contributes the largest value of mineral production (excluding fuel oil and atomic minerals) in the country. It is endowed with rich mineral resources with a variety of metallic and non-metallic minerals that include Chromite, Bauxite, Graphite, Iron-ore, Manganese ore and many more. The mining and quarrying subsector contributed 8.29 per cent of state GVA (relative to 2.26 per cent at the all-India level) as per the advance estimates (AE) for 2021-22 at current prices.

In terms of reserves in India, Odisha accounts for 96 per cent of Chromite, 92 per cent of Nickel, 51 per cent of Bauxite, 33 per cent of Iron ore, 43 per cent of Manganese ore and 24 per cent of Coal reserves in the country.

**Table 1: Share and Growth of Industry Sector and its Sub-Sectors (in percent).**

Sector and Sub-Sector	Share in GSVA in 2021-22 (AE)	Average Growth			
		Pre COVID		During COVID phase	
		2012-13 to 2015-16	2016-17 to 2019-20	2020-21	2021-22 (AE)
Industry	39.5	5.7	9.3	-10.8	14.5
Mining and Quarrying	8.3	9.6	3.3	-23.3	18.1
Manufacturing	22.1	4.8	17.1	-8.4	14.3
Construction	6.7	1.1	4.5	-3.1	13.2
Electricity, gas, water supply & other utility services	2.4	9.8	0.04	-1.7	8.0

Source: Directorate of Economics & Statistics (DE&S), Odisha

Mining also generates revenues for the government at both the central and state levels. For the state government, minerals generate (i) statutory revenues from royalties, rent etc, (ii) profits and interest income received from public enterprises functioning in the sector. As Odisha is a mineral rich state, it contributes substantial amount of revenues for the State government. The production, dispatch of minerals, and collection of mineral revenue in Odisha from 2016-17 to 2020-21 is presented in Table 2.

**Table 2: Production and dispatch of minerals and revenue collection (2016-17 to 2020-21)**

Year	Production (in million tonnes)	Dispatched (in million tonnes)	Revenue Collection (INR Crore)
2016-17	264.84	285.25	4925.66
2017-18	270.84	287.67	6130.97
2018-19	295.45	310.08	10479.18
2019-20	312.6	313.16	11019.86
2020-21	294.8	320.43	13918.20

Source: Directorate of Mines, Odisha

The table 3 shows the major export products from Odisha. The bulk of the exports are mineral and metal products. However, electronics and software and marine exports are gaining significance.

**Table 3: Major Export Products from Odisha (INR Crore)**

Products	2019-20	2020-21	Share in Value of Exports (per cent)
Metallurgical	24811.40	38122.95	47.46
Engg. Chemical and Allied	4434.18	7854.68	9.78
Minerals	14627.10	26189.58	32.61
Agriculture and Forest	187.18	177.85	0.22
Marine	3028.88	3114.16	3.88
Handloom	0.90	0.09	0.00
Handicraft	3.08	7.74	0.01
Textile	131.64	205.5	0.26
Pharmaceutical	6.34	8.8	0.01
Electronics and Software	4500.00	4600.00	5.73
Others	11.62	36.97	0.05

Source: Directorate of Export Promotion and Marketing, Govt. of Odisha

As seen from the Table 4, there is a significant rise in export destinations for traditionally exported products like metallurgical, engineering and chemical, and mineral products. Besides, agriculture, handicraft, textile, electronics and software are also some of the important export products where there is a significant rise in destination countries.

**Table 4: Rise in export destination from Odisha**

Category	2015-16	2020-21
Metallurgical	40	92
Engineering & Chemical	79	111
Minerals	5	41
Agriculture and Forest	4	24
Marine	39	33
Handloom	13	8
Handicraft	7	19
Textile	2	17
Pharmaceutical	3	27
Electronics and Software	6	40

Source: Odisha State Economic Survey (various rounds), Govt. of Odisha

### Mining Base of Odisha

Table 5 shows the top 11 districts of Odisha with the respective major mineral availability.

**Table 5: Major Minerals and Districts**

Sl. No.	District	Major Mineral
1	Koraput	Bauxite, Chinaclay, Dolomite, Limestone, Mica, Quartz
2	Mayurbhanj	Asbestos, Fireclay, Chinaclay, Iron Ore, Kyanite, Quartzite, Soapstone, Talc, Base metal (Lead and Copper), Coal, Dolomite, Manganese, Nickel Ore, Vanadiferous/Magnetite, Gold.
3	Malkangiri	Limestone, Tin ore, Quartz
4	Nabarangapur	Chinaclay, Iron ore.
5	Rayagada	Bauxite, Graphite, Manganese, Quartz
6	Sundergarh	Lead, copper, Coal, Dolomite, Fireclay, Iron ore, Limestone, Manganese, Quartz, Bauxite.
7	Sambalpur	Coal, Base metal (Lead and Copper), Chinaclay, Fireclay.
8	Keonjhar	Asbestos, Pyroxenite, Iron Ore, Chromite, Chinaclay, yrophyllite, Manganese, Gold, Dolomite, Limestone, uartzite, Quartz
9	Kadhamal	Graphite
10	Balasore	Vanadiferous / magnetite
11	Phulbani	Graphite

**Table 6: Socio Economic Profile of Mining Districts of Odisha**

Sector	Indicator	Odisha	Keonjhar	Sundargarh	Angul	Jajpur	Jharsaguda
Poverty	Population who are multidimensionally poor (%)	29.4	41.8	24.75	24.57	20.75	18.62
Drinking Water	Households with FHTC (%)	42.5	65.8	25.9	50.4	43.2	43.8
Education	Average performance in NAS (Class 8)	44	42	43	50	52	44
Healthcare	Institutional delivery (%)	92.2	80.4	91.3	85.7	93.8	98.6
Women & Child	Children under 5 who are stunted (%)	31	36.2	32.9	28.1	25.5	27.1
Livelihood	Households with monthly income of highest earning household member - Rs. 10,000 or more (%)	4.7	4.4	4.8	9.7	7.6	7.9
Skill Development	Households with salaried job (%)	6.8	6.7	7.6	11.8	11.1	11.6
Sanitation	Population living in households that use an improved sanitation facility (%)	60.5	47.6	65.5	66.4	47.4	70
Housing	Households with Kuchha roof (%)	64	69.2	84.5	57.5	61.1	74
Afforestation	Change in Forest Cover between 2001 & 2021(%)	6.8	-4.7	4.2	5	19.7	21.4

Source: NFHS-4, NFHS – 5, Other Reports

Source: Department of Steel & Mines, Government of Odisha

**Pradhan Mantri Khanij Kshetra Yojana (PMKKKY) & District Mineral Fund (DMF)**

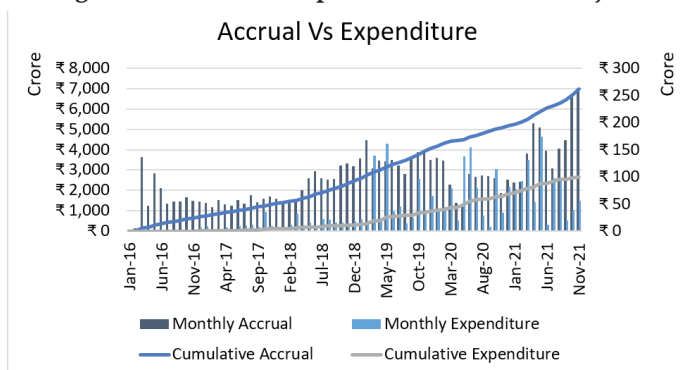
Government of India has formulated Pradhan Mantri Khanij Kshetra Kalyan Yojana (PMKKKY) which is implemented by the District Mineral Fund (DMF) using the funds accruing to the DMF. These funds are used for the welfare of persons and areas affected by mining related operations. Utilisation of funds has two aspects: 60% of PMKKKY funds to be utilized under High Priority sectors and 40% of PMKKKY funds to be utilized under Other Priority sectors. DMFs will prepare and maintain

an updated list of directly and indirectly affected areas as well as affected people. Affected people to include both “affected family” and “displaced family”.

**Case Study: DMF Keonjhar**

DMF Keonjhar is largest DMF in the country. The District Mineral Foundation (DMF), a non-profit statutory trust, set up under the Mines and Minerals (Development and Regulation) Act (amended in 2015), in every district affected by mining operations, offers an unprecedented potential to positively impact the lives of millions of people affected due to mining.

Figure 1: Accrual Vs Expenditure of DMF Keonjhar



### A. Area: Nutrition/WCD

#### Major Indicators (NFHS-5)

- Underweight: 37% (Keonjhar), 30% (Odisha)
- Stunting: 36% (Keonjhar), 31% (Odisha)
- Wasting: 24% (Keonjhar), 18% (Odisha)
- Severe Wasting: 6% (Keonjhar), 6% (Odisha)
- Anaemia (Pregnant): 75% (Keonjhar), 62% (Odisha)

#### Understanding

- First 1000 days critical for optimum brain development & most vulnerable to nutrition deficit
- Children under 3 cannot feed themselves
- In tribal/mining areas mothers leave infants behind to engage in hard labour to support families
- Combination of poor purchasing power, lack of knowledge of care givers, inadequate feeding and absence of dietary diversity
- AWCs do not look after children between 06 months to 03 years
- Only hand over THR - once a week/fortnight
- Huge deficit in protein-energy nutrition offered to pregnant women/lactating mothers through THR under SNP of ICDS viz-a-viz Recommended Dietary Allowance (RDA)
- Considering high poverty, unlikely that deficit will be met fully at household level from other sources
- THR also often shared with other members of family
- THR fails to provide MDD – consumption of 5 or more food groups
- Poorest households in Keonjhar often consume only rice, dal and salt

- Pregnant women also do not prefer to consume IFA as they claim to suffer from gastritis
- 1000+ AWCs do not have their own buildings and operate out of rented premises/AWW's residence etc.
- Many AWC buildings are old/dilapidated
- None of the AWCs are child friendly
- Most AWWs cook meal using firewood - time taking and Indoor Air Pollution (IAP)

### Solutions

- Denial of malnutrition
- Engaging existing machinery for additional tasks
- Lack of credible NGOs to work on scale
- Risk of setting up parallel systems in the district
- Huge delay in construction
- Poor capacity of WCD Dept
- Scale up Creches (1000+)
- Scale up NRCs (10+)
- Upgradation of AWCs (1000+)
- Introduce Hot Cooked Meal (HCM) for pregnant women/ lactating mothers
- Establish nutri-gardens to improve dietary diversity in high malnutrition pockets
- Expand Mid Day Meal from elementary to secondary level
- Supplement nutritional value of Take Home Ration (THR) provided under SNP to children between 06 months to 3 years
- Roll out intervention for regular screening and counselling of adolescents/pregnant women/ lactating mothers for reducing IDA
- Introduce iron-fortified rice under MDM

### B. Area: Health

#### Major Indicators (NFHS-5)

- Institutional Births: 80% (Keonjhar), 92% (Odisha)
- Full Immunization: 86% (Keonjhar), 90% (Odisha)
- 4 ANC's: 57% (Keonjhar), 78% (Odisha)
- IMR: 524 out of ~30,000 live births (Keonjhar), 38 (Odisha)
- MMR: 13 out of 30,000 live births (Keonjhar), 9.7 (Odisha)

## **Understanding**

- Shortage of doctors - major challenge in rural areas
- Only 1 doctor for 13,154 people in rural Odisha against state average of 1:2323 & WHO norm of 1:1000
- Huge shortage of specialists such as paediatricians, gynaecologists, orthopaedic surgeons, anaesthetists, radiologists etc. even in DHH
- Pregnant women in remote tribal pockets do not deliver in institutions leading to high infant/maternal mortality/morbidity, pre-term delivery due to malnutrition/other complications, ambulances not reachable, high OPE
- Almost 75% of infant deaths within 1 month of birth – a large proportion on day 0/1
- 25% of infant deaths due to LBW & 15% due to birth asphyxia
- > 25-30 patients referred from district to SCB Cuttack every day due to poor tertiary health services
- Navigating SCB overwhelming for patients/ attendants – often duped/ mistreated
- Huge deficit in EIF in all health institutions
- No functional OT/ ICU/ MGPS even in DHH
- Faulty Medical College Hospital design – significant deviations from mandatory norms (MCI/NBC/ AERB) & design guidelines

## **Solution**

- Twin challenge of improving public health indicators & running hospitals/ health centres efficiently
- Logistics of establishing Medical College Hospital in parallel
- Distractions due to COVID management
- Onboarding private sector partners for specialized services
- Risk of setting up parallel systems in the district
- Poor capacity of Health Dept
- Scale up Digital Dispensaries (50+)
- Scale up Maternal Waiting Homes (10+)
- Support commissioning of Medical College Hospital
- Upgrade PHCs/CHCs/SDHs/DHH to meet various standards/ accreditations/ certifications – IPHS/ NQAS/ Kayakalpa/ LaQshya etc.
- Establish Paediatric/ Neonatal ICU in DHH

- Introduce MMUs for screening/ treatment/ referral - pulmonary/occupational diseases in mining areas
- Develop ARC into an Integrated Disability Rehab Centre
- Set up Common Bio-Medical Waste Treatment Facility (CBWTF), STP & ETP in DHH
- Introduce Centralized Mother-Child Tracking & Counselling System (MCTCS)
- Establish advanced diagnostics/pathology/radiology facilities in all CHC/ SDHs & DHH
- Establish Trauma Care Units (Level II) in SDHs/ DHH
- Establish Multi-Speciality Hospital

## **C. Area: Education**

### **Major Indicators (NFHS-5 & UDISE)**

- NER at Primary Level: 91% (Keonjhar), 87% (Odisha)
- Annual dropout at Primary level: 6.3% (Keonjhar), 5.4% (Odisha)
- NER at Upper Primary Level: 92% (Keonjhar), 85% (Odisha)
- Annual dropout at Upper Primary level: 9.4 % (Keonjhar), 6.9 % (Odisha)
- Retention at Elementary level: 61% (Keonjhar), 73% (Odisha)
- NER at Secondary level: 65% (Keonjhar), 56% (Odisha)
- Annual dropout at Secondary level: 5% (Keonjhar), 5.4% (Odisha)
- Retention at Secondary level: 89% (Keonjhar), 95% (Odisha)
- Transition from Secondary to Higher Secondary level: 88% (Keonjhar), 93% (Odisha)
- Women - 10+ years of schooling: 30% (Keonjhar), 33% (Odisha)

## **Understanding**

- Large number of out-of-school children
- High drop out at Primary & Upper Primary level
- Low retention at Elementary level
- Low enrolment at Secondary level
- Low learning outcomes at all levels/ average pass % in class X
- Wide gap in learning levels of General/OBC and SC/ ST children

- Low aspirations of teachers/students/parents
- Poor socio-economic conditions and consequent engagement of school going children in formal/informal labour
- Distance from habitation – especially high schools & lack of RTE entitlements post elementary level
- Poor learning levels and consequent loss of interest of children to study further
- No incentive for parents/teachers to motivate students to complete full education cycle
- Poor infrastructure in schools
- Lack of even basics like bench-desks in classrooms
- ~ 3/4th of schools not even connected to electricity

#### **Solution**

- Denial of out-of-school children
- High focus on infrastructure development viz-a-viz improving learning outcomes
- Huge delay in construction
- Schools shut down due to COVID
- Lack of credible NGOs to work on scale
- Risk of setting up parallel systems in the district
- Poor capacity of Education Dept
- Scale up High School transformation program (e-learning, science labs, WASH, sports, libraries, etc)
- Scale up ISO certification of tribal complexes in saturation mode
- Re-start and scale-up DMF Scholarships (Class III, V, VIII & BSE)
- Put in place system to identify, track, pull-back and rehabilitate out-of-school/ drop out children
- Develop residential facilities at high schools to address low enrolment at Secondary level
- Extend RTE entitlements (MDM) to high school students
- Roll out initiative for improving learning outcomes – foundational literacy and numeracy at Primary level
- Roll out initiative in high schools for achieving 100% pass percentage in Class X
- Roll out initiative for digital literacy for high school students
- Set up sports nurseries at select schools/ locations in district to nurture budding sportspersons

- Establish Model Residential Schools (4) – 2500+ capacity each
- Roll out initiative for career counselling for high school students

#### **D. Area: Livelihood**

##### **Major Indicators**

- Households in rural areas with heads earning below Rs. 5000 per month: 90%

- Annual Production (Agriculture) Crops:

**Paddy:** ~ 60,00,000 Quintal (Y: ~ 32 Quintal/Ha)

**Maize:** ~ 35,000 Quintal

**Pulses:** ~ 1,50,000 Quintal

- Annual Production (Horticulture) Crops:

**Mango:** ~ 45,000 MT, Jackfruit: ~ 20,000 MT

**Banana:** ~ 18,000 MT, Cashew: ~ 5,000 MT

**Ginger:** ~ 10,000 MT, Onion: ~ 7,500 MT

**Tomato:** ~ 1,40,000 MT, Brinjal: 1,70,000 MT

**Cabbage:** ~ 72,000 MT, Cauliflower: 62,000 MT

- Annual Production NTFP:

**Sal Seed:** ~ 10,000 Quintal, Tamarind: ~ 4,000 Quintal

**Mahua Seed:** ~ 1,000 Quintal, Chara Seed: 500 Quintal

##### **Understanding**

- Traditionally, tribal and forest dwelling communities dependent on subsistence/shifting agriculture and forest produce for livelihood
- 25% cultivators, 40% agricultural labour, 3% industrial workers
- Out of total cultivated area – 53% highlands & 34% medium lands
- Small and marginal farmers constitute ~ 80% of total cultivators
- Average size of land holding is ~ 1 Ha
- Agriculture is largely rainfed and limited to kharif only
- High population pressure on land, raising cost of inputs, informal sources of credit, growing vulnerabilities to climate extremities and lower than remunerative prices – migration of male members in search of wage employment for 6-8 months time
- Goat rearing – ATM of tribal people
- Tasar (pre-cocoon) – high returns in 2-3 months

**Solution**

- Pre-agriculture/hunting-gathering/ subsistence level livelihood activities
- Poor irrigation potential due to hydro-geological limitations
- Low input consumption (fertilizers/ pesticides/ certified seeds)
- Poor yield
- Traditional techniques / skill sets
- Need for immediate returns/ lack of entrepreneurial spirit
- Poor capacity of line departments
- Lack of credible NGOs to scale
- Difficulty in monitoring/ evaluating returns at beneficiary level
- Scale up WADI project
- Scale up TASAR project
- Scale up APC project
- Roll out initiative in poultry sector for small holders
  - Broiler (600 birds/batch)
  - Layer (400 birds/batch)
  - Pullet (500 birds/batch)
  - Feed plant + Integrated Parent Farm + Hatchery
- Roll out initiative in goat rearing sector among tribal families
  - Support services for preventive/curative disease control
  - Breed improvement
  - Feeding and shelter improvement
  - Marketing linkage
  - Community insurance
- Roll out initiative in inland fisheries sector
  - Training around standard PoP
  - Fingerlings production
  - Ice Box/ Cooling Chambers
  - Support to fishing cooperatives
- Horticulture based Food Parks for processing/ value addition

**Table 7: Impact of DMF Keonjhar: NFHS 5 (2019-21) Vs NFHS 4 (2015-16)**

Particular	Keonjhar	Odisha
Reduction in Stunting	19%	9%
Reduction in Underweight	16%	14%
Increase in Institutional Births	11%	8%
Increase in improved drinking water access	9%	2%

Source: NFHS 4 (2015-16), NFHS 5 (2019-21)

**Case for DMF Wealth Model**

While mining has led to unimaginable wealth for a handful of mining companies, the local communities who have lived there for centuries, on the very land and its resources, have silently suffered physical displacement, environmental degradation and poverty, with little or no compensation or rehabilitation. What makes things more complicated is that 90% of India’s coal and 80% of its other minerals are found in tribal areas, inhabited by undoubtedly the most deprived social group in the country, whose very survival is closely linked with the fate of these lands and the forests standing over them. According to the Twenty-ninth Report of the Commissioner of the Scheduled Castes and Tribes (1990), over 40% of those displaced for development in the country are tribal people, though they constitute only about 8% of the total population.

The DMF offers an opportunity to correct this historical injustice. It recognizes the right of people to benefit from the land and its natural resources, traditionally held by them either individually or as a community. Mining companies operating in the districts now have to pay 10% of the royalty paid to the state governments (or 30% in case of leases granted after 12 January 2015 ) for major minerals and 10% of the royalty (or 30% in case the lease has not been granted through auctions) in the case of minor minerals to the DMFs. According to the Union Ministry of Mines (February 2017), the total DMF collection across various mining affected districts in the country since the institution of the DMFs in 2015, stands at Rs 5800 Cr. Keonjhar district of Odisha, rich in iron ore deposits, tops the chart with an annual accrual of Rs 600-800 Cr under the DMF, which is expected to continue for the next 30-40 years.

**Challenges**

Though the potential is unprecedented, the districts are facing enormous challenges to utilize the funds effectively for the development of people affected due to

mining. Districts administrations/ors are used to typical government schemes, where funds are granted from above, with clear design, guidelines and instructions. This is perhaps the first instance, where funds (of such magnitude) are generated locally and are to be spent locally and the state governments have largely left it to the district administrations to plan and execute projects under the DMF, with minimal interference (a rare *laissez-faire* within the bureaucracy). Without requisite administrative set up or resources for planning, district administrations across the country have started allocating funds under the DMF for different works, often in an ad-hoc manner. In most districts, systematic planning has been a non starter. Due to the huge fund inflow (often at the rate of Rs 1-2 Cr/day in mining intensive districts) and the intense pressure to show quick results, neither situational analysis nor need assessment has been carried out prior to project selection. Without planning, projects have been selected in a top-down manner, based on recommendations from government line departments only. Even though approval of plans, programmes and projects by Gram Sabha is mandatory in Scheduled Areas as the provisions of the Panchayats (Extension to Scheduled Areas) Act, there has been no serious effort in this regard, in letter or spirit. Most of the projects taken up under DMFs are scattered across sectors and geographies and stand in silos, without any inter-relation, either spatially or temporally, due to which the opportunity for integrated development (a Key Performance Indicator under schemes like Sansad Adarsh Gram Yojana) of mining affected villages/clusters is lost.

A brief analysis of the various projects sanctioned under the DMF shows that they are largely physical infrastructure oriented. Construction of roads, bridges and buildings are a common feature that can be seen across districts. Even in 'soft' sectors like health and education, allocations are skewed towards construction. For e.g. in Keonjhar, almost the entire allocation under the education sector is only for the construction of additional classrooms. Though it is relatively well recognized and widely understood that infrastructure matters to economic growth, how much (scale) and which (type) infrastructure to develop is not as clearly settled. More infrastructures may not necessarily cause more growth. Infrastructure is expensive and infrastructure spending is often inefficient.

The effect of infrastructure on growth will also depend on the ability of the local population to take advantage of it. However, little investment has been made into building human capacities of the mining affected population under DMF. Also, efforts to improve the quantity and quality of service delivery by utilizing the

existing infrastructure is also largely missing. Another major practical challenge is that since the funds are now locally allocated to different line departments, there is no mechanism in place to verify whether a project taken up under DMF by a line department already exists on the ground or has also been sanctioned/approved under the state budget for the concerned department. This leads to the risk of duplication and misappropriation.

Lastly, there seems to be a wide-spread (but misplaced) assumption that the funds flowing into the DMFs, will continue in perpetuity. However, the fact is that depending on the quantum of mineral reserves in the district and the rate of extraction, the lifespan of the DMFs would vary from one district to the other. In the case of a district like Keonjhar, at the current rate of extraction (which is below average), it would be possible to economically mine iron ore for the next 40-60 years. However, if the rate of extraction increases (say to the level of 2008-09), the lifespan of mining operations in the district and therefore that of the DMFs, would reduce significantly (to ~25-30 years). It is therefore important to look at DMF as wealth and not as revenue to be frittered away in a limited time period.

### **Recommendation:**

The fund flowing into the DMFs is inherited wealth from a non-renewable resource and not revenue, to be squandered away in consumption. It is therefore important to utilize it thoughtfully for the development of the current generation and also invest it wisely for the welfare of future generations to come, who will otherwise neither have the mineral wealth nor the money. It is recommended that the funds accruing under the DMFs be saved as a corpus in a permanent Sovereign Wealth Fund (SWF) and invested in real and financial assets. The annual returns/earnings from the investment should be paid as a dividend (Basic Income) to all mining affected persons, after inflation proofing the corpus.

### **Case of Keonjhar DMF Wealth Model**

Let us considering a hypothetical situation (see Box below) where Keonjhar district of Odisha, which receives about Rs 800 Cr per annum, decides not to spend the money and rather invest the amount in a Sovereign Wealth Fund (SWF). Let us assume that the district continues to receive Rs 800 Cr per annum into the DMF account, for the next 40 years, after which the mineral reserves are exhausted. Let us also assume that the district gets an annual return of 10% on the investment, out of which it retains half of the amount for inflation proofing and distributes the remaining amount equally to all mining affected persons in the district (including children). In such a scenario, each person in the mining

affected villages of Keonjhar will get an annual dividend of Rs 941 and each family (of say 5 persons) will get an annual dividend of Rs 4706, in the first year.

The annual dividend will continuously raise and in the 17th year each mining affected family will receive more than Rs 1,00,000 per annum and in the 40th year, when the mining reserves get exhausted, the annual dividend per person will climb up to Rs 71,400 and each family will receive Rs 3,57,000. The cumulative principle amount at that point of time will be Rs 96,640 Cr.

After the 40th year, when the district will no longer receive fresh inflows (i.e. Rs 800 Cr per annum) into the DMF and the annual dividend per family will continue to grow at a constant rate of 3.75% and reach a figure of Rs 5,61,125 in the 50th year, Rs 12,97,104 in the 75th year and Rs 32,59,826 in the 100th year. At that point of time, the principle amount available will be more than Rs 18,00,000 Cr.

Considering an annual inflation of 5%, the annual dividend is inflation proofed till the 33rd year. However, it can be reasonably assumed that the Y-o-Y inflation in the country will ease to the level of 1-2% (as in developed countries) after 33 years, thereby ensuring that the annual dividend will continue to grow in real terms every year, well into the future.

Let us considering a hypothetical situation where Keonjhar district of Odisha decides not to spend the DMF inflows immediately and rather invest it in a Sovereign Wealth Fund (SWF).

**Assumptions made:**

- Average annual fund accrual: Rs 800 Cr
- Lifespan of fund accrual: 40 years
- Average annual Return on Investment (RoI): 10%

Year	Principal (in Cr)	RoI @10% (in Cr)	Inflation Proofing @ 5% (in Cr)	Total amount for payment of dividend (in Cr)	Mining affected Population	Dividend per person/ annum (Rs)	Dividend per family/ annum (Rs)	Annual % Growth of dividend
1	800.0	80.0	40.0	40.0	425000.0	941.2	4705.9	
2	1640.0	164.0	82.0	82.0	430100.0	1906.5	9532.7	102.6
3	2522.0	252.2	126.1	126.1	435261.2	2897.1	14485.6	52.0
4	3448.1	344.8	172.4	172.4	440484.3	3914.0	19569.9	35.1
5	4420.5	442.1	221.0	221.0	445770.1	4958.3	24791.4	26.7
10	10062.3	1006.2	503.1	503.1	473166.0	10633.0	53164.8	12.7
25	38181.7	3818.2	1909.1	1909.1	565875.9	33736.8	168684.0	6.0
50	157416.1	15741.6	7870.8	7870.8	762489.8	103225.0	516125.2	3.8
75	533066.7	53306.7	26653.3	26653.3	1027417.3	259420.8	1297103.8	3.8
100	1805153.2	180515.3	90257.7	90257.7	1384393.9	651965.2	3259825.8	3.8

- Average annual inflation: 5%
- Total number of mining affected persons: 425,000 (in 491 villages)
- Average annual population growth: 1.2%
- Average size of a household: 5 persons

**Advantages of a Permanent Fund and Basic Income under DMF:**

First and foremost, the corpus is protected and invested for healthy returns, into a permanent fund. It is not spent like revenue/income and therefore will continue to exist indefinitely. The mining affected families will continue

to benefit from the mineral wealth in the form of annual dividends, across generations, long after the mineral is exhausted and mining operations come to a halt. The affected community, which has suffered decades of injustice will benefit directly and immediately. The incompetence and mediocrity of the bureaucracy in planning and implementation will no longer affect the development of the community. It may simply be the fastest way of reducing poverty. Direct benefit transfer in the form of Basic Income will prevent corruption, misappropriation, wastages, leakages and inefficiencies in the delivery system that currently plagues the implementation of myriad schemes of the Centre and

State. It will also help break the infamous contract-bureaucrat-politician nexus, which is ubiquitous with public service delivery in the country. It will also keep the size of the government machinery small and nimble and will promote the philosophy of 'minimum government, maximum governance'.

The Basic Income will help break the idea of citizen as a passive beneficiary of government benevolence and will empower him to become an agent of change, defined in terms of his own values and goals. It will give the mining affected persons, the freedom of choice to spend with dignity on goods and services that fulfil his needs. Greater cash flow in the mining affected areas will also help naturally attract private investments, especially in the tertiary/service sectors like education (private schools), healthcare (nursing homes), retail (small shops), transport (private buses) etc. This will greatly improve the quality of life of mining affected families, increase job creation and entrepreneurial opportunities and also reduce the burden of service delivery on government institutions.

Research from across the world has shown that resource richness weakens democracy. In mining areas, local satraps and mining mafia flout laws with impunity, buy political patronage, intimidate the poor indigenous population, purchase social license to operate through regular cash doles and savagely suppress discontent, if expressed by any section. In such a scenario, the idea of transparent and regular payments to all mining affected persons and their future descendants (from legal mining operations) will give them a strong reason to fight back illegal mining. Paying annual dividends and then attempting to shore up state coffers from tax and non-tax sources through local Panchayats will not only strengthen the financial health of the PRIs but also fuel public demand for a transparent, efficient and responsive government, leading to the strengthening of democracy at grass-root level.

As the Basic Income is fully funded by mineral wealth, it will not lead to increase in taxes for the general population. While critics to the Basic Income (at the national level) worry that Basic Income will replace myriad welfare schemes like MGNREGA, PMAY, NHM, MDM, PDS, SBA etc due to fiscal limitations, this is not the case with BI under DMF, as it only supplements the existing schemes.

## Conclusion

Mining is essential for the economic growth of a nation. Although mining is seen as an extractive sector, it can be a partner in achieving the Sustainable Development Goals. Odisha contributes the largest value of mineral

production (excluding fuel oil and atomic minerals) in the country. It is endowed with rich mineral resources with a variety of metallic and non-metallic minerals that include Chromite, Bauxite, Graphite, Iron-ore, Manganese ore and many more. The mining and quarrying subsector contributed 8.29 per cent of state GVA (relative to 2.26 per cent at the all-India level) as per the advance estimates (AE) for 2021-22 at current prices. In terms of reserves in India, Odisha accounts for 96 per cent of Chromite, 92 per cent of Nickel, 51 per cent of Bauxite, 33 per cent of Iron ore, 43 per cent of Manganese ore and 24 per cent of Coal reserves in the country. Government of India has formulated Pradhan Mantri Khanij Kshetra Kalyan Yojana which is implemented by the District Mineral Fund (DMF) using the funds accruing to the DMF. These funds are used for the welfare of persons and areas affected by mining related operations. The DMF offers an opportunity to correct this historical injustice. It recognizes the right of people to benefit from the land and its natural resources, traditionally held by them either individually or as a community. DMF Keonjhar is largest DMF in the country. In its current state, DMF accrual will only flow from the extracting companies to the various departments of the Government, without passing through the hands of the citizens. It is proposed that all or part of the accrual be invested in an Alaska-type permanent fund and an annual dividend from the investment be transferred directly to citizens, so that they can decide how it is to be spent. Mineral wealth need not be a curse. It can even be a blessing, provided the right measures are taken to transform it into sustainable development.

## Way Forward

**Capacity Building:** Ensure that the capacities/capabilities of Government Departments at districts are adequately built/bolstered in order to improve their ability to absorb DMF funds, in addition to own budget

**Monitoring & Evaluation:** Ensure that projects/initiatives are monitored using digital tools & technologies as per pre-defined KPIs/ schedules and delays/deviations, if any are flagged immediately and course corrections are undertaken

**Process:** Ensure that due process is followed at each and every step including obtaining necessary board approvals, undertaking procurement as per GFRs/PWD Codes, signing contracts with clear terms & conditions, routing funds as per rules.

**Planning:** Ensure that projects/ initiatives sanctioned are need/ evidence based and will help achieve pre-determined goals, targets and indicators in a time-bound manner using SDG/ADP type framework

**Design:** Ensure that projects/initiatives are designed/ detailed out after extensive research, benchmarking and analysis of all possible alternatives, with active participation of Line Departments

**Partnership:** Ensure DMF partners with right/ reputed organizations with capabilities/ commitments to appropriate solutions and create strong and symbiotic linkages between Govt. Depts and Partner Organizations for success of initiatives

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