

# Vichaar-Vimarsh

# JUST

# Transition

## NEWSLETTER

**FEATURE**

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Chairman, Peerless Group; ex-Chairman, CIL

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## REPURPOSING COAL ASSETS FOR A SUSTAINABLE TRANSITION



### Message from the Desk of the Senior Director, TERI

I am pleased to announce that we are back again to place before you the 5th edition of our bi-annual Newsletter - 'Vichaar-Vimarsh' and share rich perspectives of researchers, academia, professionals from coal companies, civil society and think tanks around the core theme of "Repurposing of coal assets for a sustainable transition". I am sure such an exchange of knowledge will not only connect various stakeholders who are willing to engage actively in charting out a new trajectory and contribute in building a low carbon economy.

A continuous reflection on the aspect of people-centric transition will generate greater conviction, trigger alternative thinking and innovation. This also creates a momentum for a call to collective action, future-ready policies, and actionable ideas.

I urge all the readers to engage in our humble effort of knowledge dissemination and reach out to their respective network for spreading the message of sustainable transition.

**A K Saxena**  
Senior Director  
Electricity and Renewables Division





**Transitioning away from fossil fuels in energy systems, in a just, orderly and equitable manner, [is key to] accelerating action in this critical decade, so as to achieve net zero by 2050 in keeping with the science**

- Dubai Consensus, COP28



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TERI team interacting with a tribal woman in Chhendipada, Odisha (Photo Credit: Apoorva Singh)





## Editorial

At the outset, we are glad to submit that our small step of reaching out to the believers of people-centric approaches and eliciting their varied worldviews through this newsletter has immensely helped in sustaining a dialogue that reinforces the core belief of inclusive and equitable growth. It is heartening to see the positive response we have received over the last two years as we created a collage basis the ground realities of coal-producing geographies as well as certain reflections, perspectives, and possibilities which also enabled us to comprehend a pro-people narrative.

Sustainable and inclusive transition is indeed a progressive thinking that allows one to take an empathetic view of the citizenry that bears the burden of unbridled development marked by its carbon footprint, environmental degradation, resource depletion, adversity, and associated vulnerabilities. As carbon-heavy growth manifests in various forms of enhanced risks, disparity, and inequity, it also propels us towards an alternative thinking of promoting a carbon-neutral economy and instilling a sense of hope through a proactive response and responsible action.

Essentially Vichaar-Vimarsh has created a space for channelizing this positive thinking and through this, we encourage a collective discourse that can shape the future of a fossil-fuel-based existence. The key theme of this edition “Repurposing coal assets for a sustainable energy transition” assumes significance as it opens up the door for critically examining opportunities of promoting an ecosystem which helps diversify local economy, facilitates meaningful industry-community interface, and fosters collaborations.

Let’s connect, co-create, and co-exist in the times to come.

- Jayanta Mitra, Ph.D., Senior Fellow, TERI



# REPURPOSING OF COAL ASSETS FOR SUSTAINABLE ENERGY TRANSITION

Partha Sarathi Bhattacharyya, Chairman, Peerless Group; ex-Chairman, CIL



Kumardhubi coal mine (Source: flickr)

Repurposing coal assets is in essence a subset of the wider issue of energy transition away from fossil fuels to environmentally benign sources of energy. On one side of the debate is the collective human effort to combat the challenge of climate change and contain global warming to 1.5 degree Celsius in the long run. On the other side lies the challenge of improving quality of life of billions of underprivileged people that requires substantial growth in flow of energy particularly in the developing countries, India being a prominent one among those.

GHG emissions in 2023 have reportedly been the highest in any one year of human history. It has set the globe on the course of a devastating 2.7 degree Celsius global warming. As the world recovered from the pandemic,

the cry for a reversal of the trend to net zero emission by 2050 for containing global warming to 1.5 degree Celsius has grown louder. The exceptions are China and India who have set 2060 and 2070 respectively, as the timeline for attaining net zero. The current decade till 2030 is considered most crucial in setting the right direction. A 45% reduction by the end of the decade is deemed imperative for course correction to attain the long hyphen in long-term term goal. Although the multiple ongoing wars continuing unabated in various geographies are casting serious shadows of doubt on attainment of such goals, the fact that around 120 countries and over 1000 large Corporations have committed to act in this direction remains an indicator of collective human resolve to deal with the global crisis.





Net zero emission calls for offsetting the entire emission of CO<sub>2</sub> caused by human activities through a combination of measures directed at emission reduction and carbon capture. So how does coal, use of which is bound to emit CO<sub>2</sub>, become carbon neutral?

The two broad range of activities that facilitates the process are:

1. Mitigating emission of toxic gases by preparing the coal for use in High Efficiency Low Emission (HELE) power generation technologies and coal gasification to produce syn gas for use as feedstock.
2. Capturing the reduced carbon emission through large-scale afforestation coupled with avoidance of deforestation initially, and adoption of carbon sequestration and capture or utilization (CCS/CCUS) technologies, as and when these become available at affordable prices, with the commitment of advanced nations to invest USD 100 billion annually in R&D fructifying.

Indian coal is intrinsically high in ash. Preparing such coal for use in low emission power generation or coal gasification will essentially call for reduction of ash. This can be achieved with available state-of-the-art closed circuit technology for washing of coal with minimum power and water consumption.

The progress of washery construction in India has suffered primarily due to low efficacy of coal washing in the old washeries of the coal companies as well as the controversies surrounding the washing practices of the private washeries. The clarity on the environmental impact of traditional coal washing, particularly the generation and use of rejects has remained ambiguous. These factors led to the reversal of an earlier 2015 MoEFCC direction that mandated washing for coal consumed at distances exceeding 500 kms or in cities. Also a lack of consensus on who should bear the cost of washing - the coal producer or consumer, has hindered progress of large-scale washery construction.

With the statutory compulsion of coal washing withdrawn, it is primarily the economic benefits to consumer and producer that should determine the future trajectory of washeries. From the perspective of the consumer, it is not fair to expect them to bear the cost of washing. However, it is fair to expect them to accept a higher price in energy units (Rs./GCal) for washed coal with higher Calorific Value (CV) as opposed to unwashed coal of lower CV consistent with price trends prevailing internationally.

A major impediment to coal washing in earlier years was the escape of CV of coal through rejects that constituted 20–25% of the coal fed into washeries. The latest State of the Art washing technology has reduced it significantly to around 14% with very low CV that renders the rejects not amenable to any use other than land filling. Another impediment was the large consumption of water for coal washing. Latest technology allows a major portion of the water to be recycled, thus reducing the consumption drastically. The modern plants are power efficient and as tests at the National Institute of Advanced Science at Bangalore have established, the washing process, besides reducing ash in coal also yields substantial reduction in SO<sub>x</sub>, NO<sub>x</sub> and PM<sub>2.5</sub>.

An economic impediment to coal washing is the flawed pricing structure of domestic coal. Globally, the price of coal rises rapidly as CV increases. Broadly for every 1% rise in CV the coal price in Rs/Tonne increases by 2.5 to 3%. For coal price expressed in energy units – Rs/GCal, more relevant for the coal consumer, the rise is by 1.5 to 2%. This allows the producer the much needed scope to infuse CAPEX and meet operating expenses gainfully and bring state of the art technology for coal washing. In other words, the pricing norms enable absorbing the cost of washing completely. No wonder, the traded coal are largely washed.

In contrast, the notified price of domestic coal supplied to power sector in Rs/Tonne increases linearly with GCV i.e @1% for every 1% rise of GCV. For price expressed in Rs/GCal, the increase is nearly flat. This does not leave any margin for quality improvement of Indian coal by the producer.

The impact on coal consumer for such state of affairs is even worse. The landed cost of coal at any power station comprises of 3 major components. Besides, the pithead price of coal charged by the producer which is flat is Rs/GCal terms, the other major components such as rail freight and GST Compensation cess are both fixed in Rs/Tonne and therefore sloping downwards when expressed in Rs/GCal. Hence, the aggregate of these components constituting the landed price is also sloping downwards in Rs/GCal. In other words the power stations, in the current pricing regime, are required to pay a higher price for low CV coal and lower price for high CV coal! The fact that Indian coal is largely low in CV unless washed makes the situation even worse for the consumer of 'as mined' coal. This renders coal washing even more imperative.

To create proper incentive for producing and consuming washed coal by bringing in advanced technology for coal



washing, it is critical to restructure the pricing pattern along international price vs CV trend, of course in a revenue neutral manner.

Coming to carbon capture, till such time as cost-effective technologies are developed, India should rely on intensifying afforestation and protect flora and fauna from the onslaught of mining activities. The track record of CIL, in the area of afforestation, pleasantly surprised the global investors during the IPO, contributing to its resounding success. It transpired from records that for every acre of forest land diverted for mining purposes, the coal companies recreated 2.5 acres of forest. The question regarding the density of artificial forests was squarely answered when the exercise carried out by MoEFCC to ascertain high density forests through satellite mapping indicated presence of these artificially created forests in the list. Also, in the area of land restoration and reclamation, it was established through satellite images that in most opencast mines these activities were carried out commensurately.

Therefore, the thrust on coal washing and afforestation are already prevailing. Heightening these further is within the realms of possibility. Once carried out with rigor it should enable the coal sector to reduce carbon footprint considerably.

Emanating from the Paris accord, another area of focus of energy transition away from fossil fuel is to evolve a roadmap that makes the transition smooth rather than bumpy for people directly or indirectly dependent on coal mining. Any deliberation on greening of coal must address this aspect as well.

As a first step, this requires recognizing the fact that the current operations comprise of a limited number of large - and medium-sized mechanized opencast mines that contribute the bulk of production and profits besides a large number of legacy low productive high manpower non-mechanized underground and opencast mines in the older coalfields that are mostly loss making.

There are around 180 mines in CIL incurring loss greater

than Rs.1000 per tonne. They engage 40% of the total workforce to produce a meagre 5% of coal entailing a loss of Rs.15,000 crores per year.

Therefore, an orderly transition can be facilitated by planned and systematic closure of these mines in the first phase. The regular employees may be partly allowed to leave by availing a specially formulated attractive VRS and rest retrained for proper mine closure, land reclamation and restoration and preparing the land for alternate use.

The closure of these loss making mines will cause a fundamental shift in the coal scenario. It will release large tract of land that can be made ready for diversifying into solar power or agriculture or alternate economic use as the local situation demands. It will also release substantial productive manpower for such activities. Most importantly, it will largely help coal sector in its move to attain Just Transition much before the coal production reaches its peak level in two decades from now.

Closure of loss making operations coupled with opening of a limited number of highly mechanized opencast mines in the relatively newer coalfields will lead to financial consolidation and enhanced profitability. There is therefore a strong economic rationale to commence such planned and systematic closure of these mines now instead of waiting for coal to reach its peak before commencing the downhill journey two or three decades later. The resulting consequences on livelihood of people, engaged directly or indirectly with mining activity can be dealt in a fair and equitable manner by a financially strong and consolidated coal sector. Needless to emphasize that the process will require committed support of political and administrative dispensation.

Once the 1st phase of orderly mine closure is completed in a time frame of 15 to 20 years, the stage will be set for Just Transition phase 2. The experience gained in phase 1, with the institutional framework maturing by then will ensure a seamless and less disruptive transition away from coal, besides getting closer, if not meeting, the objective of carbon neutrality for the coal sector.



# LIVING WITH COAL IN INDIA: COAL EXPANSIONS AND LIVELIHOODS CHANGE IN MANUGURU, TELANGANA STATE 2011 TO 2022

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Singareni opencast coal mines at Manuguru, Khammam district, Telangana. (Source: Wikimedia Commons)

## Introduction

This article summarizes recent research (for details please see Oskarsson et al., 2024) on long-term livelihoods change from coal mining expansions. The intent is to explore what it is like to live with mines between displacement and coal sector jobs as agricultural and

forest-dwelling communities slowly become part of the expanding coal economy. The article traverses challenges faced by the villagers in an Indian coalfield, and the many uncertain opportunities and risks that come with this key national energy source which poses a threat to the global climate. While coal energy is not competitive compared especially to solar power, it continues to hold

firm control over India's national electricity production and, increasingly, the aspirations of rural households who seek benefits from the economic expansion associated with mining operations.

**IMPOVERISHMENT DUE TO FORCED DISPLACEMENT THUS EXISTS SIDE-BY-SIDE WITH OTHERWISE INCONCEIVABLE GENERATIONAL IMPROVEMENTS FOR THE FEW ABLE TO SECURE JOB COMPENSATION.**

We use the coal town Manuguru in Telangana state as an entry point when seeking an improved understanding of the longer term experiences of people whose lives have become intertwined with coal. Via data collection in 2011 and 2022 we outline how people live with past injustices of forced displacement while having to make do mainly with insecure, informal jobs related to coal. As this former agricultural town and its rural hinterland is slowly transformed into a major energy producer we are however also able to note a range of other experiences which include educational attainments leading to upward social mobility, and Adivasi households able to secure middle class lifestyles based on much-coveted public sector jobs as compensation for displacement. Impoverishment due to forced displacement thus



Open pit coal mine in Manuguru.  
(Photo Credit: Author's own)

exists side-by-side with otherwise inconceivable generational improvements for the few able to secure job compensation.

Specifically this article explores livelihood changes from (a) the establishment of mines which takes away land from farmers, herders, and many others in exchange for mainly cash compensation, (b) the operating mine which degrades the environment, but also offers benefits in terms of jobs, and (c) mine closure in which the land can potentially be returned to the original land losers, but instead is typically handed over to the forest department for plantations.

## Case study: Coal expansions in Manuguru Town

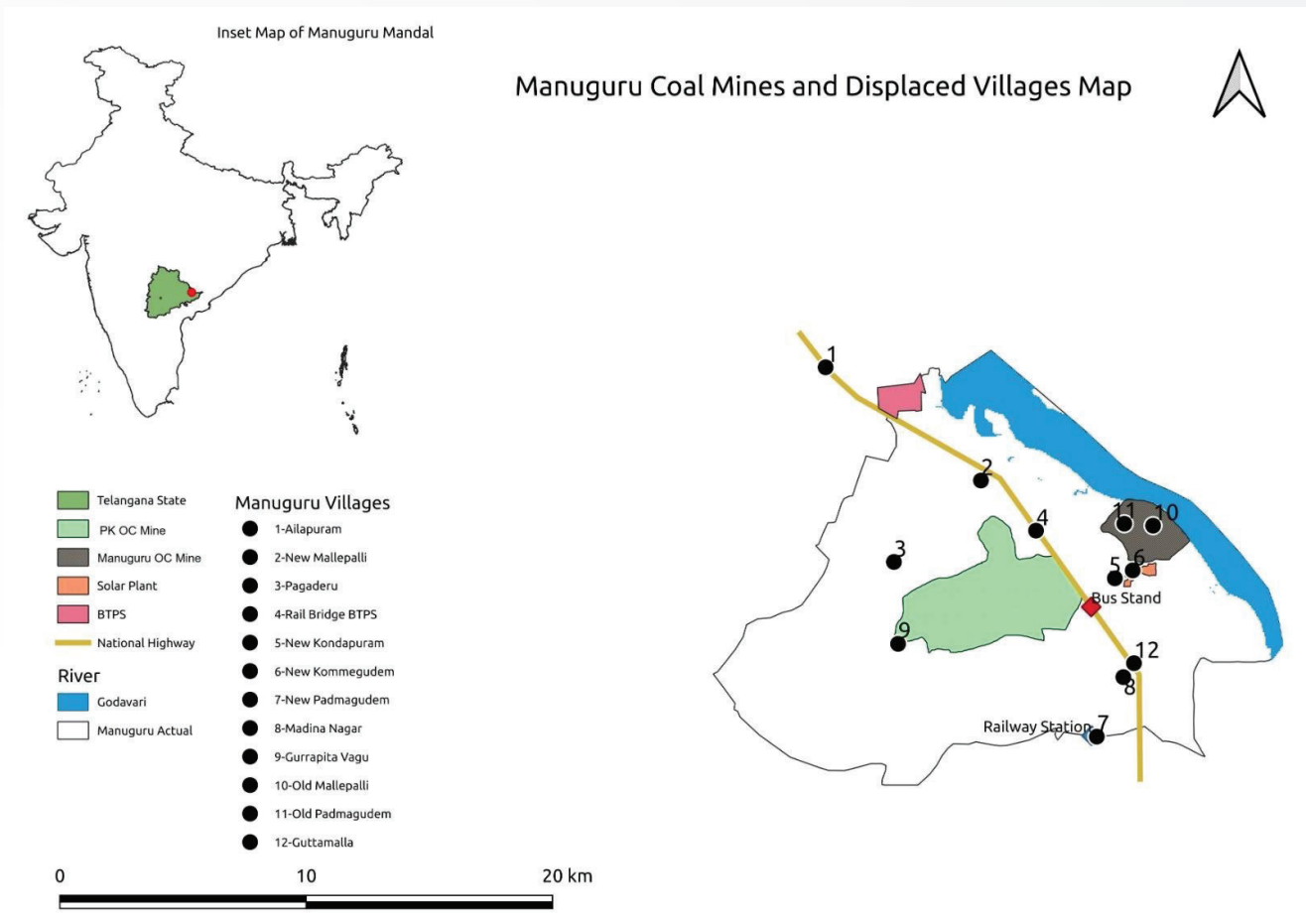
The Singareni Collieries Company Limited (SCCL) is a public sector company jointly owned by the central government and the Government of Telangana. It has a monopoly on mining coal along the Godavari River in Telangana state, and owns 45 mines in total that produced 65 million tonnes of coal in the 2021–2022 fiscal year. Many coal mines in Telangana, including those in Manuguru, lie in the so-called Scheduled Areas where land has constitutionally been reserved for the benefit of the scheduled tribes, or Adivasis, since colonial times to protect them against exploitation. As elsewhere there is, however, a lack of implementation of Adivasi land rights, and large-scale industrial, forestry, and individual non-Adivasi farmers have usurped most land since long before coal mining arrived. Our attempts to understand how coal extraction shapes community life at present, thus become embroiled in a politically charged history strongly influenced by colonial and post-colonial dispossession.

Coal mining in Manuguru commenced with underground extraction in 1974. In 2004 the first large open pit mine was proposed,<sup>1</sup> and started operations in 2008. At the time of the first fieldwork in 2011 the mine was expanding into nearby forest lands inhabited by Adivasi and Dalit households (See Figure 1 above). In addition, a new open pit mine had been approved and the acquisition of agricultural land next to the Godavari River was underway. The Manuguru mining expansions at that time were part of a vast effort to increase coal mining across the state with 16,000 hectares land proposed for coal mining by the SCCL.

<sup>1</sup> After several expansions this mine was renamed Prakasham Khani in 2020.







Coal mines around Manuguru town with displaced villages (Photo Credit: Author's own)

**MANY COAL MINES IN TELANGANA, INCLUDING THOSE IN MANUGURU, LIE IN THE SO-CALLED SCHEDULED AREAS WHERE LAND HAS CONSTITUTIONALLY BEEN RESERVED FOR THE BENEFIT OF THE SCHEDULED TRIBES, OR ADIVASIS, SINCE COLONIAL TIMES TO PROTECT THEM AGAINST EXPLOITATION**

In 2022 when the research team returned to Manuguru, the two open pit mines continued to expand together with an older, underground mine operated by a private contractor. The Bhadradi Thermal Power Station (BTPS),<sup>2</sup> a solar power plant, and a geothermal experimental plant had come up immediately next to the mines thereby

<sup>2</sup> The first part of the plant was commissioned in 2020 and is at present expanding.

transforming the area into an energy hub in just over ten years. The coal mines have drastically increased their planned annual output rates to support the power plant, and are at present planned to close in 2026 and 2030, respectively. While plans for more mining around Manuguru are not known at the time of writing, new mines appear likely in support of the BTPS which will remain operational for the next 30 years. Thus, Manuguru looks set to continue depending on coal.

## Livelihoods change in Manuguru

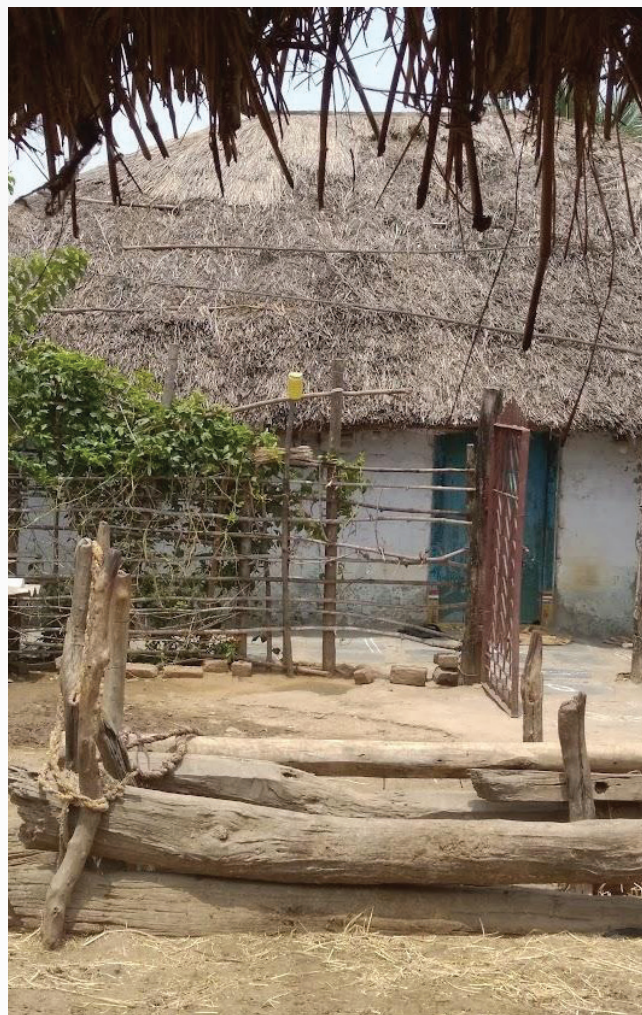
Flat and fertile lands along the Godavari River like those around Manuguru town have since generations been occupied by non-Adivasi settler farmers in contravention with Adivasi land rights. Like in similar locations across central-eastern India, the adivasis instead became agricultural workers, casual labourers or possibly upland farmers or forest product collectors in the remaining upland forest tracts with less fertile land. The coal mining expansion in Manuguru over the past decade is thus only

to a limited extent about Adivasi dispossession since this process was completed before the coal industry arrived.

As a result of the land grab of farm lands, and related long-term migration to Manuguru, the coal-affected groups are highly varied and include the so called other backward classes (OBC<sup>3</sup>), Dalits and Adivasis. The adivasis have by far better rights in policy documents whereas the OBC groups are better off with ability to mobilize support from, for example, political parties or by going to court. The Dalits meanwhile end up in between, most often without land titles, and with neither government support nor own strong support base. In 2011, OBC households occupied, though typically did not own, the best agricultural fields next to the Godavari River.<sup>4</sup> In upland forests, Dalit households cultivated land without title deeds with little prospect for compensation. Some Adivasis still lived in separate villages in the forests, but most lived in mixed villages on the agricultural plains.

In 2011 respondent demands centred on saving agricultural livelihoods from the expanding mines. Only a handful interviewed had a coal-related job, and only in temporary occupation as for example security guard rather than with the mining company. It was as if local livelihoods and the coal mines existed side by side without immediate links other than the displacement and environmental effects like depleting groundwater. However, by 2022 people from the same villages have largely left agriculture and aspire to work in the coal sector. The expansion of coal economy and changes to land compensation policies where displacement of private agricultural land is now compensated with one job per household, have shifted household aspirations towards the coal sector.

At the moment few if anyone interviewed considered the next step in the life of a mine which is mine closure. When an open pit coal mine closes it leaves a deep crater which can be several hundred metres wide as well as deep, and nearby overburden hills. These large scars in the landscape tend to make other land uses and alternative livelihoods difficult to envision. In India, most research efforts in recent decades, have focused on land loss due to mining expansions, but a well-designed and effective mine closure plan may mitigate the impact of the loss of jobs and sources of livelihood, and improve the



House of displaced OBC household in Aiyilapuram (Photo Credit: Author's own)

possibilities to find other land uses after a mine closes. At the same time it is clear that mine closure can be very expensive given the major changes to the landscape implied by extensive open pit mining.

**IN INDIA, MOST RESEARCH EFFORTS IN RECENT DECADES, HAVE FOCUSED ON LAND LOSS DUE TO MINING EXPANSIONS, BUT A WELL-DESIGNED AND EFFECTIVE MINE CLOSURE PLAN MAY MITIGATE THE IMPACT OF THE LOSS OF JOBS AND SOURCES OF LIVELIHOOD, AND IMPROVE THE POSSIBILITIES TO FIND OTHER LAND USES AFTER A MINE CLOSURES.**

3 In Telangana state there are both Hindu and Muslim groups included among OBCs.

4 The state land rights legislation prevents non-Adivasi households from owning land in the area. There was, however, a possibility for non-Adivasis to gain an exemption from this ban before 1969.





Manuguru is to experience mine closures. Two, old underground mines were converted into the open pit mine Manuguru OC, whereas a third underground mine continues operating at very low levels of output. As per planning documents the two presently operating open pit mines in the area will, Prakasham Khani OC and Manuguru OC will, however, close in just a few years making planning for a future beyond coal imperative. Of the 595 hectare agricultural land that the SCCL acquired for the Manuguru OC mine in 2014, 430 hectares will be handed over to the state forest department for plantations on closure. This represents a major change of land use in a short period of time: over about twelve years of coal mining 2014-2026, 16 million tonnes of coal will have been extracted, but the farms and fields appear lost forever.

## Conclusion

The people in and around the agricultural town Manuguru have experienced enormous livelihood changes over the past decade into a major energy hub, with inhabitants increasingly transitioning to the coal economy. In 2011 hardly anyone in coal-side villages worked in the mines, whereas the main demand of the youth in 2022 is to get jobs in the mines. The coal sector thus more than ever dominates the local economy, not to mention uses up an overwhelming part of the land. In the wake of these changes, communities increasingly find their aspirations turned towards the industry and away from land-based occupations. Local jobs, however, tend to be available intermittently within for example construction or transport services, apart from some of the displaced Adivasis who secured the gold standard for rural households – a permanent public sector job able to secure the family for the foreseeable future.

The widespread international policy attention in support of a just transition and energy justice for

mining communities have been a welcome addition in recent years. This study, however, alerts us to the continued need to revisit existing policies related to compensation, rehabilitation and resettlement and their implementation. The social tensions emerging in Manuguru from uneven compensation policies and their indifferent implementation need to be addressed. While the historically marginalized Adivasis receive comparatively better compensation packages in Manuguru, there is a need to acknowledge the many ways in which policy further marginalizes already disempowered Dalits. And a lack of attention to prevent OBC household land grabs historically means that these groups fail to see present displacement without meaningful compensation as justice even though this is happening since their land holdings are illegal in an area where only Adivasis can own private land.

The only transition that is visible in Manuguru is thus towards further intensified coal production. The coal sector dominates the local economy of Manuguru and uses an overwhelming part of its land. A transition away from coal in the area is harder to imagine today than it was a decade ago given the mining expansion, and the changed aspirations noted among large segments of the population who now broadly seek more lucrative jobs in the coal industry. The only planned transition away from coal is to provide mined-out land to the forest department to raise plantations. The scant details of these plans make them appear as commercial plantations that would not support the needs of local, post-displacement livelihoods.

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# COAL MINING IN MEGHALAYA: CONTEXT, COSTS & ALTERNATIVE COURSES OF ACTION

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Coal mining in Meghalaya (Source: Flickr)

## Indigenous land tenure system - the context for coal mining

For indigenous communities around the world, land is their most valued and respected resource. They often have a special intergenerational attachment to the land as the source of all life, while they act as custodians, holding deep traditional ecological knowledge that supports sustainable natural resource management.<sup>1</sup> In

the northeastern state of Meghalaya, customary land rights and tenure systems of the Khasis, Jaintias and Garos, the dominant tribes of the state, also echo a deep and communal relationship with the land. In the Khasi and Jaintia Hills, two kinds of land exist - the Ri Raid (communally owned) and Ri Kynti (privately owned by the clan or individual).<sup>2</sup> These traditional understandings of land tenure and rights are protected under the Sixth Schedule of the Constitution of India.

<sup>1</sup> Amnesty International. (n.d.). Indigenous Peoples. Amnesty.org. <http://tiny.cc/amestyinternational>

<sup>2</sup> Soreide, K.V. & Gloppen, S. (2019). Tribal Representation and Local Land Governance in the Khasi Hills of Meghalaya, India, Forum for Development Studies.47:1, 113-137, DOI: 10.1080/08039410.2019.1593238.





**THESE EXCLUSIVE TRIBAL OWNERSHIP RIGHTS, THE INVOLVEMENT OF TRADITIONAL INSTITUTIONS AND ADCS IN GOVERNANCE, AND THE COMPARATIVE NON-INTERFERENCE OF THE GOVERNMENT IN REGULATING COAL MINING IN MEGHALAYA MAKE IT A UNIQUE CASE THAT HAS BEEN CONCEPTUALIZED BY JACOB VAKKAYIL AS AN "AREA OF LIMITED STATEHOOD"**

Apart from a small municipal area within Shillong City, the whole area of Meghalaya falls under the Sixth Schedule with key provisions for the safeguarding of tribal autonomy<sup>3</sup> and protection of indigenous customs. Land is, thus, governed by Autonomous District Councils (ADCs)<sup>4</sup> and traditional tribal institutions playing the role of "co-managers" of land.<sup>5</sup> It is within this context that we must understand coal mining in Meghalaya. Here, the state has rights over minerals, including coal. Therefore, it has never been nationalized. Unlike other parts of India, coal reserves are privately owned by the local tribal people. These exclusive tribal ownership rights, the involvement of traditional institutions and ADCs in governance, and the comparative non-interference of the government in regulating coal mining in Meghalaya make it a unique case that has been conceptualized by Jacob Vakkayil as an "area of limited statehood".<sup>6</sup>

**ARTISANAL AND SMALL-SCALE MINING (ASM), I.E., MINING OF MINERAL RESOURCES WITHOUT SCIENTIFIC MACHINERY, HAS BEEN A CUSTOMARY PRACTICE IN MEGHALAYA FOR WELL OVER TWO HUNDRED YEARS**

Coal mines are widespread over Meghalaya but most heavily concentrated in Jaintia Hills (Sutnga, Lakadong, Musiang-Lamare, Khliehriat, Loksi, Ladrymbai, Rymbai, Byrwai, Chyrmang, Bapung, Jarain, Shkentalang, Lumshnong, Sakynphor etc.).<sup>7</sup> In Khasi Hills, coal deposits are predominantly found in Borsora Langrin, Nongjri-Shallang, Bairung, Mawlong-Shella, Sohra, Laitryngew, Mawmluh, Laitduh, Jarain, Wahlong, Mawstoh, Mawsynram, Jathang, Mawdon, etc. In Garo Hills, the prominent coalfields are in East & West Darrangiri, Siju, Nangalbibra, Singimari, Rongrenggre, Jangkhre, Mermelsaram, Rengotim, Agalgitim, Nabru, Holwang Baljong, Dogring, Asilgaon hill, Kylas Hill, and Pendengru-Balpakram.<sup>8</sup>



Rat hole mining in Meghalaya (Source:Flickr)

## Land ownership & a coal-based economy - a changing scenario

Artisanal and small-scale mining (ASM<sup>9</sup>), i.e., mining of mineral resources without scientific machinery, has been a customary practice in Meghalaya for well over two hundred years, with informal and small beginnings. Today, it is a "small-scale and unorganized venture" that has benefitted a few, taken the form of 'rat-hole' mining,<sup>10</sup> deemed unsafe and unscientific, and wreaking

3 for the 'Scheduled Tribes' (STs)

4 Formed under the Sixth Schedule

5 Soreide, K.V. & Gloppen, S. (2019). Tribal Representation and Local Land Governance in the Khasi Hills of Meghalaya, India, *Forum for Development Studies*.47:1, 113-137, DOI: 10.1080/08039410.2019.1593238.

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10 Karmakar, Rahul. (2023). Understanding rat-hole mining. *The Hindu*. <https://www.thehindu.com/news/national/understanding-rat-hole-mining-explained/article67588357.ecm>

havoc on the environment. In 2014, the National Green Tribunal (NGT) banned the practice. The coal mining industry in Meghalaya functions as a clandestine or “shadow” economy. Various entities, including tribal councils, traders’ associations, insurgents, different levels of government, border security forces (in the context of exports to Bangladesh), and even operators of weighbridges and toll gates, have historically operated without legal consequences. This state of legal immunity persisted until the imposition of the coal mining ban by the NGT in 2014.<sup>11</sup> The Supreme Court also upheld the ban, though it allowed transportation of assessed coal inventories of approximately 32,00,000 MT, while the Meghalaya High Court monitors the same.<sup>12</sup>

**AS [COAL MINING] BECAME A SOURCE OF WEALTH CREATION FOR THE LANDED, WE SEE THE PRIVATIZATION OF COMMUNAL LANDS IN FAVOUR OF PRIVATELY-HELD LAND SET ASIDE FOR COAL MINING IN CERTAIN PARTS OF THE KHASI-JAINTIA HILLS**

However, as per the Eighteenth Interim Report of Justice (retd.) B. P. Katakey filed before the High Court of Meghalaya in November 2023 that the quantity of inventoried coal found after re-verification and reassessment by conducting a drone survey was 14,10,710.41 MT. The Committee’s reports consistently highlighted discrepancies and recommended a time limit for Coal India Limited (CIL) to dispose of the re-assessed coal. The reports also outlined steps to halt illegal mining, including the transportation of unlawfully mined coal, and offered various recommendations for implementing directives from the Supreme Court and the National Green Tribunal (NGT).<sup>13</sup> It is unfortunate that illegal mining continues while coal is being transported across borders. In 2023, the High Court of Meghalaya declined to exonerate the State government from complicity

11 Citizen’s Report. (2018). Curse of Unregulated Coal Mining in Meghalaya (Vol 1), A Citizen’s Report from Meghalaya  
12 PTI. (2023). Illegal coal mining: Meghalaya HC orders transfer of SP. Energy World from The Economic Times. <https://energy.economicstimes.indiatimes.com/news/coal/illegal-coal-mining-meghalaya-hc-orders-transfer-of-sp/106167884>  
13 Eighteenth Interim Report, Justice (retd.) Brojendra Prasad Katakey, November 14th, 2023 (filed before the High Court of Meghalaya)

in the export of illegally mined coal to neighbouring Bangladesh.<sup>14</sup>

Defenders of mining rights have argued that the NGT ban comes in conflict with customary rights to land and minerals in Meghalaya.<sup>15</sup> The ban is said to have stripped the livelihoods of indigenous communities, destroying an economy that mainly runs on coal. However, the relationship between mining and development for the local tribals is “contentious and ambiguous”.<sup>16</sup>

**COUPLED WITH THE LARGE-SCALE ENGAGEMENT OF CHEAP MIGRANT LABOUR FROM BANGLADESH AND OTHER NEIGHBOURING AREAS, THIS HAS LED TO THE EXCLUSION OF MANY TRIBAL PEOPLE FROM THE BENEFITS OF COAL MINING AND TRADE ACTIVITIES, NEGATIVELY IMPACTING THEIR LIVELIHOODS AND INTENSIFYING SOCIO-ECONOMIC INEQUALITY.**

Coal mining has been a significant source of livelihood for local tribals, acting as a stimulus to the local economy through the creation of jobs, directly and indirectly. However, as it became a source of wealth creation for the landed, we see the privatization of communal lands in favour of privately-held land set aside for coal mining in certain parts of the Khasi-Jaintia Hills.<sup>17</sup> Numerous villages have witnessed the aggregation of coal-bearing areas under the control of only a handful of large-scale mine owners, resulting in the displacement and landlessness of many indigenous residents. These big coal barons in Meghalaya are also increasingly becoming absentee landlords, relocating to urbanised areas while leasing or outsourcing the management of their mines. Although the official ownership rights belong to the indigenous tribal people, however, many non-tribal

14 The Hindu Bureau. (2023). Nine years after ban, coal mining to resume in Meghalaya, says CM Sangma. The Hindu. <https://www.thehindu.com/news/national/other-states/coal-mining-to-be-resumed-in-meghalaya/article66803721.ece>  
15 Stoke, Hugo. (2017). Legal limits to tribal governance: coal mining in Meghalaya, India. CMI Brief vol. 16 no. 2. <https://www.cmi.no/publications/6185-legal-limits-to-tribal-governance>  
16 Bebington, Anthony. Et al. (2008). Contention and Ambiguity: Mining and the Possibilities of Development. Development and Change, International Institute of Social Studies, The Hague. <https://doi.org/10.1111/j.1467-7660.2008.00517.x>  
17 Stoke, Hugo. (2017). Legal limits to tribal governance: coal mining in Meghalaya, India. CMI Brief vol. 16 no. 2. <https://www.cmi.no/publications/6185-legal-limits-to-tribal-governance>





individuals or external entrepreneurs now actively control key mining operations. Coupled with the large-scale engagement of cheap migrant labour from Bangladesh and other neighbouring areas, this has led to the exclusion of many tribal people from the benefits of coal mining and trade activities, negatively impacting their livelihoods and intensifying socio-economic inequality.

## Human and ecological cost - The need for a just transition

The imperative shift away from coal becomes glaringly apparent upon scrutiny of the severe consequences arising from unregulated coal mining operations in Meghalaya. The absence of adequate pollution control measures, mine land reclamation initiatives, and adherence to safety regulations has culminated in extensive ecological damage, which includes land and water degradation, depletion of vegetation and forests, and loss of life. The escalation of Acid Mine Drainage (AMD) has reached critical levels, resulting in highly acidic and substandard pH levels in rivers, springs, taps, etc., all of which fall below permissible drinking water standards. The contamination of the Lukha River in East Jaintia Hills is an apt example of acid mine drainage and run-off from coal mines, which has led to the blueing of the river as well as the deaths of hundreds of fish in it. The phycoremediation method was used to detoxify the river in a recent pilot project of the Government of Meghalaya.<sup>18</sup>

**WHILE THE NGT BAN WAS CORRECT IN RECOGNIZING THE ILLS OF RAT-HOLE MINING, IT HAS FAILED IN THE ABSENCE OF A CLEAR TRANSITION PLAN THAT ACCOUNTS FOR ALL STAKEHOLDERS IN THE ECOSYSTEM.**

The loss of biological life in water bodies, coupled with the surpassing of National Ambient Air Quality Standards in coal mining and storage areas, also underscore the urgent need to raise social awareness regarding the environmental and health risks associated with haphazard coal mining practices. Furthermore, the absence of essential safety measures has given rise to numerous mining accidents, leading to fatalities and

18 Mawrie, Ibankyntiew. (2022). Lukha alive and kicking, thanks to Algae!. The Shillong Times. <https://theshillongtimes.com/2022/03/18/lukha-alive-and-kicking-thanks-to-algae/>

severe injuries among workers. A Land Conflict Watch analysis in January 2024 found that “nearly 60 people either lost their lives or suffered injuries due to illegal coal mining in the state since 2012”.<sup>19</sup> A poignant example occurred on December 13, 2018, in Ksan village, where 15 miners were trapped underground, awaiting rescue. This incident serves as a stark reminder of the dire consequences stemming from the lax implementation of safety protocols in the coal mining industry.<sup>20</sup>

It is clear and agreed upon that illegal mining in Meghalaya needs to stop. The Eighteenth Interim Report also reiterated that “Implementation of the action plan for mine closure is advised to be taken up on a priority basis.”<sup>21</sup> However, a truly just transition remains unanswered, one that centres people whose livelihoods have depended on a coal-based economy. Communities and workers cannot be left like stranded assets, and a roadmap that phases out mining but also protects workers, their families, and the environment is needed. While the NGT ban was correct in recognizing the ills of rat-hole mining, it has failed in the absence of a clear transition plan that accounts for all stakeholders in the ecosystem.

In Meghalaya, the ban was sweeping - a hard no, without a clear path forward for those who had made their livelihoods from coal mining for decades. Rajya Sabha MP and former state president of the ruling National People's Party (NPP), in Meghalaya, W.R. Kharlukhi recently stated that “denying coal mining” is akin to “denying food for our people”;<sup>22</sup> also highlighting how the ban did not offer compensation to those who lost their source of income. Familiar anecdotes from the affected areas often echo this sentiment, as locals highlight the lack of alternative livelihoods. There are hardly any agricultural lands left, and those with lands find them unfit for agriculture - polluted by coal mining. There is also no other industry that will allow for alternative employment for the local people. In a recent interview, the incumbent Chief Minister of Meghalaya, Conrad K. Sangma termed the move as “sudden”, citing a lack of a transition period for

19 Kujur, Sagar Anupa. (2024). Unbridled illegal coal mining in Meghalaya despite court ban. Land Conflict Watch. <https://www.landconflictwatch.org/conflicts/unbridled-illegal-coal-mining-in-meghalaya-despite-court-ban>

20 Meghalaya Pollution Control Board (1997). Environmental Impact of Coal Mining in Jaintia Hills District.

21 The Shillong Times. (2023). Justice Katakey's interim report belies govt's claims. The Shillong Times. <https://theshillongtimes.com/2023/11/23/justice-katakeys-interim-report-belies-govts-claims/>

22 Syllad.(2023). NGT ordered ban on coal mining in Meghalaya but fails to take action on pollution in New Delhi. Syllad, The Rising Meghalaya. <https://www.syllad.com/ngt-ordered-ban-on-coal-mining-in-meghalaya-but-fails-to-take-action-on-pollution-in-delhi-kharlukhi/>



locals to adapt to new livelihoods. He suggested a more phased approach, announced plans of adopting scientific mining methods, and advocated for policy reforms to legalize and provide alternatives to coal mining, particularly focusing on agriculture and tourism sectors.<sup>23</sup>

**TRADITIONAL LAND OWNERSHIP SYSTEMS HAVE BEEN SUBVERTED, NECESSITATING A HALT ON LAND REGISTRATIONS IN MINING AREAS UNTIL PROPER MAPPING AND REGULATORY FRAMEWORKS ARE ESTABLISHED.**

In 2019, the Supreme Court lifted the NGT ban, allowing coal mining through scientific mining methods and upholding the tribal rights to land, as well as, the minerals beneath it. For locals, though, it has not been seen as a comprehensive solution - as the process involves a tedious bureaucratic process and a clause that the proposed mining area should not be less than 100 hectares.<sup>24</sup> Locals have criticized this as mining lands are generally scattered, and few hold the required size to start scientific mining. Many have alleged that the SC order benefits big businesses and politicians, adversely affecting small-scale miners. Thus, Meghalaya's need for a just transition remains - even as coal mining remains a heated political issue.

## A shift towards safer, cleaner, and greener alternatives

Traditional land ownership systems have been subverted, necessitating a halt on land registrations in mining areas until **proper mapping and regulatory frameworks** are established. To counter revenue losses from corruption and lax transportation standards, adopting GPS tracking and IT systems for transparency is imperative. Real-time satellite monitoring should be used for tracking illegal mining, overseen by an independent Supreme Court committee ensuring environmental compliance.

<sup>23</sup> North East Live Digital Desk. (2023). People will indulge in coal mining till alternative livelihood options are available: Meghalaya CM. North East Live TV. <https://northeastlivetv.com/around-ne/meghalaya/people-will-indulge-in-illegal-coal-mining-till-alternate-livelihood-options-are-available-meghalaya-cm/>

<sup>24</sup> Zahan, Syeda Ambia. (2023). Why Rat-hole Mining Ban In The Coal Belt Is A Major Election Issue In Meghalaya. Outlook India. <https://www.outlookindia.com/national/why-rat-hole-mining-ban-in-the-coal-belt-is-a-major-election-issue-in-meghalaya-magazine-260898>

Transparent disclosure of mining operations is also crucial for public vigilance, complemented by implementing whistleblower protection laws for exposing violations.

In pursuit of the objective to transform the coal industry, it is also imperative to invest in the **skill development and education of the local workforce**. Repurposing initiatives should encompass comprehensive capacity-building and training programmes strategically designed to equip individuals with skills pertinent to emerging industries. This approach ensures a seamless transition for workers and effectively mitigates the socio-economic impact of coal mine closures. Moreover, the imperative lies in **ensuring legal protection and upholding fair labour standards** for coal miners in Meghalaya, safeguarding their well-being and fundamental rights. Given the region's unique terrain and cultural dynamics, tailored legislation is indispensable to address the specific challenges encountered by miners, encompassing clear provisions on working conditions, including hours, wages, and safety protocols. Additionally, stringent enforcement mechanisms must be established to eradicate undesirable practices, such as child labour, and to guarantee access to adequate healthcare for miners.

Concurrently, the repurposing of coal assets demands a steadfast commitment to **environmental rehabilitation**. Progressive mine closure and the rejuvenation of reclaimed mining sites into green spaces fosters biodiversity. It restores ecosystems, thereby addressing not only the ecological damage caused by mining but also enhancing the overall quality of life for residents.

**LEVERAGING ITS ABUNDANT NATURAL RESOURCES, MEGHALAYA CAN HARNESS SOLAR, WIND, AND HYDROPOWER TO FULFIL ITS ENERGY REQUIREMENTS.**

**Strategic diversification of industries** emerges as a compelling approach to repurposing coal assets in Meghalaya. By actively fostering the growth of non-coal sectors, such as tourism and hospitality, agriculture and allied sectors, handloom and handicrafts, the state can significantly diminish its dependence on coal-centric activities. This diversification not only acts as a catalyst for economic growth but also generates fresh employment opportunities.

While being mindful of cultural preservation,





Meghalaya must advance further in terms of **research and development**, incorporating innovative and scientific technology in the quest for socio-economic development. A pivotal element in this transformative shift involves a targeted emphasis on the **development of renewable energy**. Leveraging its abundant natural resources, Meghalaya can harness solar, wind, and hydropower to fulfil its energy requirements. Investments in renewable energy infrastructure not only contribute to a cleaner environment but also position the state as a trailblazer in sustainable energy practices.

A sense of rootedness in community and responsibility towards each other may facilitate this just transition. The Khasi folklore of “U Thlen” (the mythical giant serpent that promises lavish wealth in exchange for blood) should serve as a cautionary tale against greedy, reckless agents and means of acquiring riches at the cost of human life.<sup>25</sup> It would be beneficial for the people of Meghalaya to look inward and embrace the values, customs and traditions that nurture sustainable growth. A noteworthy example is found in long-held Khasi principles, such as “Ka Khaii ka Pateng”, encouraging not just any form of trade but emphasizing sustainable and enduring practices through generations. Additionally, by incorporating values like “Burom ia ka Mei Mariang” (Honour Mother Nature), “Kamai la ka hok” (Earn righteously), and “Ka Roi Ka Par” (Paced socio-economic progress), the people of Meghalaya can actively align their actions with principles that prioritize ethical socio-economic growth and well-being.

**Disclaimer: This article is written by the authors in their personal capacity. It does not represent the views of Good Business Lab.**

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<sup>25</sup> To read more on the folklore of ‘U Thlen’- <https://www.jstor.org/stable/23343253>

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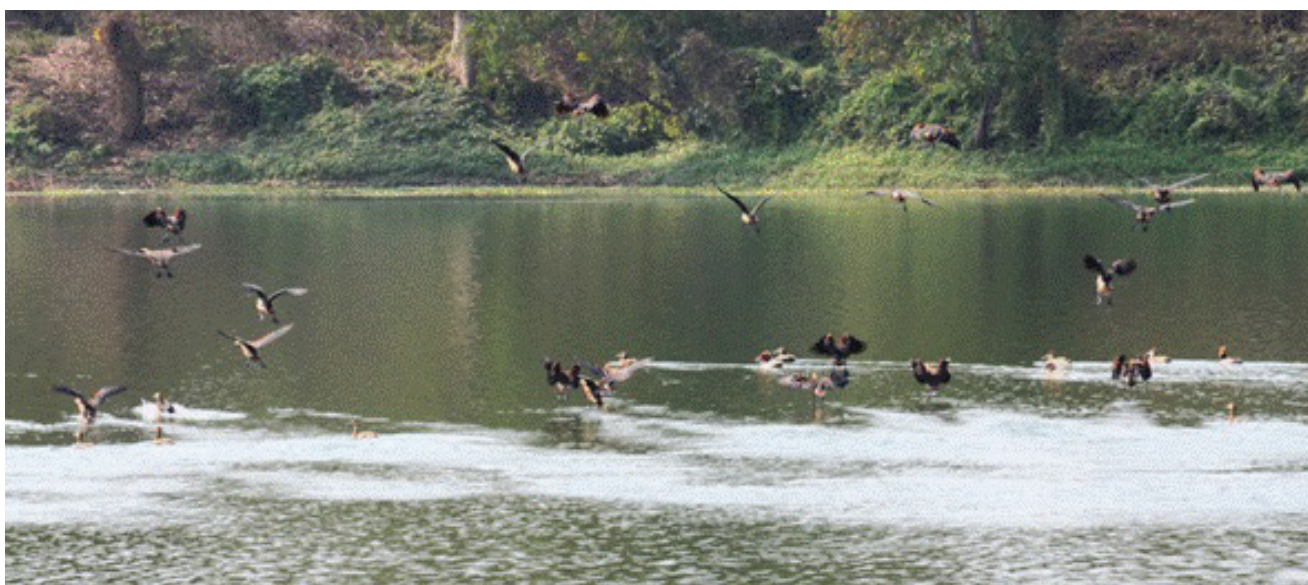


# SUSTAINABILITY IN INDIAN COAL MINES: SOME CASE STUDIES

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Promoting eco-tourism in coal mines, Gunjan Park- an open cast mine tuned into Eco Park with water body.  
Source: Ministry of Coal, link: <https://pib.gov.in/Pressreleaseshare.aspx?PRID=1701117>

In the context of coal mining and finite coal reserves, sustainable development is often viewed as a contradictory term. The traditional mining methods were more focused on short-term gains without assessing the adverse impacts on the environment and local communities. With increased awareness about sustainability and new developments in technology, focus on making mining a sustainable activity has also grown. The coal companies under Ministry have become sensitive towards sustainability in their mining and related activities. To achieve the sustainability goals many coal companies have come up with formal sustainable development policies and sustainable development cells. Under these policies, coal companies are taking

appropriate measures towards mine closure, bio-reclamation and land use management. These measures will contribute in eliminating environmental damages and encourage environmental sustainability through proper mine closure planning as it is required to carry a sustainable energy transition. The mine closure plan aims at restoration of chemical, biological and physical quality disturbed by the mining activities to the acceptable levels and to create an ecosystem which is self-sustained. Under this initiative many plantation drives have been taking place along with the development of eco parks, flora and fauna sanctuaries, playgrounds and ponds with ecological, commercial and tourist sites.





**THE MINE CLOSURE PLAN AIMS AT RESTORATION OF CHEMICAL, BIOLOGICAL AND PHYSICAL QUALITY DISTURBED BY THE MINING ACTIVITIES TO THE ACCEPTABLE LEVELS AND TO CREATE AN ECOSYSTEM WHICH IS SELF-SUSTAINED**

After the exhaustion of coal reserves, mining sites potentially provide good space for promoting tourism which is utilized by developing coal museums, eco-parks, underground visits, recreational places like golf grounds, bird watching, water sports etc. As per the Ministry of Coal, Government of India, by implementing sustainable mine closure techniques, coal/lignite PSUs have been able to create more than 30 eco-parks. These former mining locations are now stable, environmentally sound and aesthetically pleasing. This article discusses some of the initiatives taken by CIL and its subsidiaries to develop eco parks/mine tourism sites in the mined out areas.

**1. Coal museum at Saoner Eco Park, Nagpur, Western coalfields limited (WCL)**

Western coalfields, introduced this initiative with the intention of dispelling myths about pollution and environmental degradation associated with coal and mining related operations in India. A coal museum at the eco-park was developed to provide awareness about coal mining to the public. This eco mine museum also known as Soaner Mine No1, covers 6.35 hectares of area. The museum has a movie hall and allows visitors to watch videos about the origin of coal, history of coal mining, geological formation of coal, types of coal mining, coal reserves, and disasters related to mining activities, etc. The museum displays the information on coal usage in different industries such as cement, steel, brick, thermal power plants, fertilizer. The museum gives an overview of how the open cast mining is done through an open cast coal mine model with different coal samples like bituminous, lignite, anthracite and peat coal are also available for the visitors to see.

**2. The Singareni Collieries Company Limited (SCCL):**

SCCL laid the foundation stone to develop an eco-park/ tourism site in the reclaimed mining area of Gautham Khani opencast project on July 2020. This foundation was laid with an intention to transform the negative

perception of people about coal mining and related activities. It provides awareness about struggles and the hardships that goes in to produce coal from the coal mines. The eco-park offers facilities like theme plantation, water fountains, butterfly garden, boating, bird watching, cycling track, open cast mining view and water reservoirs.

**3. Neyveli lignite corporation limited (NLCIL):**

NLCIL inaugurated an eco-park at Mine-II during Vriksharopan Abhiyan in August 2021. this Eco Park at Neyveli, Mine II is located about 67 km from Puducherry and 200 km from south of Chennai. Some of the features of this eco-park are a surrounded by flowers and beautiful landscape, boat rides in eco-friendly artificially created lake in the mine refilled areas, bird watching, deer enclosure, nursery, mist chambers, goats rearing, goshala- natural reclamation of land with cows, orchard and cultivation farm lands.

For promoting ecotourism, Mine I and Mine II have also done a tie-up with Puducherry Tourism Development Corporation.

**4. Mudwani Dam Eco Park , Northern Coalfields limited (NCL):**

Mudwani Dam Eco-park was developed by NCL in Singrauli, Madhya Pradesh is a unique example of this initiative. This dam was inaugurated during Vriksharopan Abhiyan in 2021. Mudwani Dam Eco Park is located in Jayant area and is spread over an area of 84,000 metre square. The dam has a water front, sports area for children, walking tracks, it has a shopping area with local products and restaurants.



Mudwani Dam Eco Park developed by NCL, in Singrauli, Madhya Pradesh, (Source: Ministry of coal, link: <https://pib.gov.in/PressReleasePage.aspx?PRID=1900977>)



## 5. Ananya Vatika, Eco Restoration Park, South Eastern Coalfields Limited (SECL):

Ananya vatika eco restoration park, also known as Pit Lake was developed after the reclamation of stacked overburden dumps generated from the mines of Rajnagar Opencast project. It is located in Dola, Madhya Pradesh. It is one of the good examples of sustainable development and reclamation and in open cast mining projects.

**Conclusion:** The word 'restore' usually means to bring back something to the original state. Restoration in mining terms means an effort to "reinstate the original functions of the soil in full measure", with the aim of regaining ecological integrity or health (Beckett et al. 2019). To restore mined out areas and to make them suitable for the growth of flora and fauna, Ministry of Environment, Forest, and Climate Change (MoEFCC) ordered re-grassing the mined out area in the year 2020. One year later, in 2021 the Ministry of Coal launched Vriksharopan Abhiyan, which further boosted the greening initiatives of Lignite and Coal PSUs. Under Vriksharopan Abhiyan, coal companies prioritized plantation and the development of tourist sites /eco parks as a part of mine tourism on reclaimed land. Coal subsidiaries like NLCIL, NCL, and WCL have signed MOUs with respective State tourism departments to include reclaimed sites in local tourism circuit. Development of eco parks and tourism sites on the abandoned mines has also created opportunities for revenue generation and employment for local people. Launching such sustainable initiatives helped the coal community to maintain their sensitivity towards the host society and care for environment. Above discussed case studies are some of the examples of restoration of coal mines and can be replicated by the coal companies.

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# REPURPOSING OF COAL ASSETS FOR A SUSTAINABLE TRANSITION

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Coal mine in Dhanbad (Source: Flickr)

## Introduction

Coal, a combustible fossil fuel formed from the remnants of buried prehistoric plants and organic matter, has played a crucial role in the development of human civilization. From its modest origin as a heat source for early human settlements, coal evolved to become the primary fuel driving the Industrial Revolution and fostering unprecedented levels of economic development and global trade. It is one of the planet's most abundant and widely distributed energy sources; coal is the foundation of industrialization, providing essential energy for machines and power plants and driving technological innovation. Besides, its mining

supports the livelihood of many coal mine workers. Moreover, coal has reshaped the global geographical and socio-economic landscapes, including developing countries like India, as it has catered to the basic need for reliable and affordable electricity for millions of people and supported the rapid growth of industries across the country. Developing countries like India and China have experienced rapid economic growth in the past decade. To support this, large amounts of coal have been mined to generate electricity, resulting in the emission of greenhouse gases like carbon dioxide and other pollutants like sulphur dioxide and particulate matter, etc., contributing to air pollution, respiratory illnesses, and global warming. India is committed to





achieving its net zero emission target by 2070 (as per the announcement made in COP-26), and India is a signatory to the United Nations Framework Convention on Climate Change (UNFCCC), as well as its Kyoto Protocol (KP) and the Paris Agreement (PA) to reduce its ongoing emissions. To mitigate the adverse impacts of fossil fuel extraction and to fulfill its commitment to international accords, it is imperative to embark on a sustainable repurposing of existing coal infrastructure, including coal-based power plants and industries reliant on coal for heating. This transition must prioritize the well-being of all stakeholders involved, ensuring equitable opportunities for affected communities, workers, livelihood, and industries while fostering the growth of cleaner and more sustainable alternatives.

## Mapping India's coal assets: present status and future prospects

India possesses the world's fourth-largest deposits of coal, about 352.13 billion metric tonnes as of April 1, 2021. (Report on Energy Statistics, 2022). India has a coal-bearing area of 16,000 sq. km, with an active coal mining area of about 2,500 sq. km. It has been reported that 1,40,771 ha of coal-bearing land was under surface mining. Additionally, 57,000 ha of land is required for mining activities, of which 13,000 ha belongs to forest land. (Mahata & Sharma, 2021). In 2021, 932 million tonnes (MT) of coal were produced in India; of this, 90% was used to produce power (Coal Directory of India, 2020). About 80% of the nation's coal demands are met by Coal India Limited, the largest coal producer, contributing INR 400 billion to the economy and employing 13 million people (direct and indirect). Meanwhile, 0.18 million people are employed in the power sector (direct and indirect) (Pai & Zerriffi, 2021) (Spencer et al., 2018). Besides the electricity generation sector, the iron and steel industries are the largest coal consumers, mostly found near coal mining areas. Thus, the coal industry dominates the economies of many of these coal-rich states by exploiting natural resources and generating employment. Additionally, the share of renewable energy in India's total electricity mix has grown unprecedentedly during the last decade. India currently produces 279.10 GW (11.2%) of electricity using renewable technologies such as solar, wind, bioenergy, and hydropower (Annual report, 2022–23, Ministry of New and Renewable Energy, Government of India, 2023). With increasing international pressure on India and its

commitment to achieving net zero by 2070, India has significantly invested in developing renewable energy generating stations supported by various national and international organizations nationwide. The demand for fossil fuels, such as coal, is expected to decline by 50% in the next two decades if India pursues a net zero path and increases its share of renewable energy sources in India's primary energy mix. (Shalya Chinmayi, 2021).

**THIS TRANSITION MUST PRIORITIZE THE WELL-BEING OF ALL STAKEHOLDERS INVOLVED, ENSURING EQUITABLE OPPORTUNITIES FOR AFFECTED COMMUNITIES, WORKERS, LIVELIHOOD, AND INDUSTRIES WHILE FOSTERING THE GROWTH OF CLEANER AND MORE SUSTAINABLE ALTERNATIVES.**

## Identifying alternative pathways

The primary objective of a sustainable transition is to identify suitable and reliable alternatives that have the required potential to replace our existing infrastructure based on coal. A strategy that balances socioeconomic and environmental requirements must be adopted to repurpose India's coal assets. In recent years, a notable surge in the utilization of renewable energy (solar and wind energy) has been observed, due to innovation, falling costs, and favourable government policies such as the National Solar Mission, Free Solar Rooftop Scheme, etc. Besides, the government has also invested in developing pump storage facilities, battery storage units, eco-parks, and carbon sinks on available abandoned coal mines. Existing coal-based power plants and coal mines that will be closed in the near future must be repurposed or rehabilitated for alternative uses to minimize resource loss, with particular emphasis on mitigating the impact on workers' livelihoods. Employee housing and other infrastructure of these mines may repurposed for public residential use. Following are some examples where repurposing efforts are made concerning thermal power plants and coal mines.

### Coal-based Thermal Power Plant

#### 1. Badarpur Thermal Power Plant, New Delhi-

The power plant situated close to New Delhi was decommissioned on 15 October 2018 on raising



environmental concerns. The Ash Pond of this power plant has been converted into an eco-park, and the remaining land was allotted for housing purposes. (Bhushan, Singh, & C, 2022)

- 2. Rihand Thermal Power Plant, Son Bhadra, U.P-** To lessen the plant's reliance on coal and cut down on CO<sub>2</sub> emissions, NTPC intends to co-fire biomass. In addition, on about 75 acres of the former Ash Pond area of this Power Station, a 20 MW Solar PV project will be developed at Rihand. Furthermore, NTPC has planted 10 million trees around its power facilities in the past year, in addition to the 22 million trees it had planted as part of its commitment to create carbon sinks. (Proctor, 2017).
- 3. Vindhyachal Super Thermal Power Station, Madhya Pradesh, India-** This plant is designed to capture 20 tonnes of carbon dioxide (CO<sub>2</sub>) per day, which will eventually be combined with hydrogen to produce 10 tonnes of methanol per day through a catalytic hydrogenation process (Carbon Clean, 2022).
- 4. B.C. Cobb Power Plant, Muskegon, Michigan-** The plant, wholly decommissioned in 2008, has been redeveloped into a deep-water port facility. It is one of the most extensive deep-water facilities in that region, with an annual handling capacity of 1 million tonnes of freight (Forsite Development Inc., 2022). Thus, repurposing the power plant has created multiple localized livelihood opportunities and has been a development milestone for the people of Muskegon.
- 5. Nanticoke Generating Station, Canada-** North America's largest coal-fired power plant closed in 2013. It was converted to a 44-megawatt solar farm with 192,431 photovoltaic panels spread across 260 acres, generating after more than 40 years in operation. (Mining.Com, 2019).



Solar PV plant at Nanticoke Generating Station, Canada

## Coal Mines

Coal India Limited, a public sector unit in India, is committed to utilizing coal mines for several activities, such as storing and supplying mine water for domestic uses, developing Eco parks, etc. For instance,

- 1. Ningah Colliery, Sripur Area in ECL-** A reverse osmosis (RO) filter plant has been constructed inside the premises of Ningah Colliery, which utilizes coal mine water for domestic purposes. The filter plant has a capacity of 5000 litres/hour. The treated water is used for drinking purposes as well as for other domestic purposes. (Ministry of Coal, GOI, 2023)
- 2. Patansaoungi UG mine, Saoner Area, Nagpur District, Maharashtra-** A Drinking water bottling plant capacity of (15,000 Bottles per day) has been installed at Patansaoungi UG mine, which filters and packages the water bottles under the brand name "COAL NEER." The BIS & FSSAI certification was secured for the Packaged Water Drinking Water. (Ministry of Coal, GOI, 2023).
- 3. Bhanegaon OCM, Nagpur-** WCL has entered a MoU with MAHAGENCO for providing excess mine water of quantum 107.6 Lakh Cum/year from Bhanegaon OCM to meet the industrial water demand of Kaparkheda TPS. Earlier, this water demand for TPS was drawn from the Pench irrigation reservoir. Now, the water saved from the Pench reservoir is being utilized to meet the increasing water demand in Nagpur. (Ministry of Coal, GOI, 2023)
- 4. Bishrampur OC of SECL in Surajpur District of Chhattisgarh-** The above facilities have been created in an abandoned Quarry no. 6 of Bishrampur OC. It has a water-filled area of about 26 acres. The site has been developed for pisciculture and tourism. (Ministry of Coal, GOI, 2023).
- 5. BCCL Eco Parks at Dhanbad-** BCCL has attempted to reclaim the abandoned mine land and overburden dump into Eco parks at Kasunda and Lodna (Gokul Eco-Park, Lodna). It attracts many tourists from nearby places and has given a significant economic boost to local population. (Eco-tourism Programme of BCCL, 2022)





Ro plant at Ningah Colliery, ECL



Pisciculture at Bishrampur OC



Eco Park at Lodna, BCCL



Eco Park at Kasunda, BCCL

## Reskilling and workforce transition

The National Foundation for India estimated that the direct and indirect job loss in mining and allied sectors (power, iron and steel, bricks, and transportation) could affect 13 million jobs. (Kumar and Tandon, 2024). Labour working in the unorganized sectors will be worst hit as they do not possess any skills required to get jobs in other sectors. Therefore, the transition from coal must be accompanied by comprehensive reskilling and workforce development programmes to ensure a just and equitable transition for affected workers. Investments in education, training, and job placement services are essential to facilitate the transition to new industries and employment opportunities.

## Engaging stakeholders

The primary purpose of engaging stakeholders is to address the grievances of local communities and affected individuals and to implement necessary measures for their betterment by actively involving them in the planning and decision-making process. An effective repurposing of coal assets essentially requires active participation and collaboration of all the relevant stakeholders, such as coal-based companies, government bodies, trade unions, and the people (workers and affected people) in the planning and decision-making process about the repurposing of coal assets. Local communities should be aware of the need for and benefit of repurposing processes in terms of health and economics (livelihood). Transparency, accountability, and inclusivity should guide stakeholder consultations, fostering trust and cooperation among all parties involved.

## Technological advancements

Technological advancements are crucial in enabling transitions away from coal towards more sustainable energy sources. It increases our opportunity to find more suitable alternatives for the existing coal infrastructure. Innovations in renewable energy generation, energy storage, and grid integration are making alternative energy sources such as solar, wind, and hydropower more efficient, reliable, and cost-effective. Furthermore, developments in energy storage technologies, such as batteries and pumped hydro storage, address the intermittency of renewable energy sources and enhance grid stability.





**AN EFFECTIVE REPURPOSING OF COAL ASSETS ESSENTIALLY REQUIRES ACTIVE PARTICIPATION AND COLLABORATION OF ALL THE RELEVANT STAKEHOLDERS, SUCH AS COAL-BASED COMPANIES, GOVERNMENT BODIES, TRADE UNIONS, AND THE PEOPLE (WORKERS AND AFFECTED PEOPLE) IN THE PLANNING AND DECISION-MAKING PROCESS ABOUT THE REPURPOSING OF COAL ASSETS.**

## Environmental remediation

Just finding an alternative way to utilize the existing coal assets is insufficient for successfully repurposing them without improving the environmental condition. Coal mining and combustion have long-term environmental impacts, including land degradation, water pollution, air pollution, heavy metal contamination, and greenhouse gas emissions. Addressing these environmental challenges is essential to mitigate the negative impacts of coal-related activities and promote environmental sustainability. Environmental remediation efforts may include reclaiming and restoring land affected by coal mining through reforestation, soil stabilization, and habitat restoration.

## Governmental policy and regulations

A good policy plays a crucial role in repurposing processes as it promotes and provides the necessary support and commitment from the country's top leadership. In 2022, Jharkhand was the first state in the country to constitute a 'Just Transition' framework that would focus on reducing dependence on fossil fuels and promoting green energy. Parliamentary Consultative Committee attached to the Ministry of Coal also discussed the emerging issue of Coal Mine Closure – Achieving Just Transition for All on 09.11.2022 in Indore. (Press Information Bureau, 2022). Besides, the Environmental Protection Act, 1986, protection inherently supports the principles of equity and fairness in transitioning away from polluting industries like coal.

## Conclusion

Repurposing coal assets for a sustainable transition is essential for mitigating coal-based industries' adverse environmental and social impacts while fostering economic growth and promoting environmental sustainability. Coal remains the most abundant and readily available energy source on the earth's crust. It has been utilized mainly for electricity generation and has played an essential role in the country's economic upliftment. Coal mining and emissions from coal-based power plants are the major environmental polluters and cause significant environmental damage, affecting the health and well-being of many people. Coal mining and the power sector based on coal are linked with the livelihood of many people in both organized and unorganized sectors. By embracing renewable energy alternatives, investing in technological advancements, implementing environmental remediation measures, and enacting supportive policies and regulations, India can successfully repurpose its coal assets while ensuring a just and equitable transition for all stakeholders involved, with particular emphasis on reskilling the existing workforce so that their livelihood can be sustained and could lead a better life. The government has taken many initiatives in recent years to support repurposing coal assets. With concerted efforts and collaborative action, India can lead towards a cleaner, more sustainable energy future, fulfilling its commitments to global climate goals and securing a prosperous and resilient future for future generations.

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# CO-EXISTING IN THE MIDST OF TRANSITION

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An informal woman worker cleaning coal slurry at Jajpur, Odisha. (Photo credit: Pooja Gupta, NFI)

India has 46 years to develop a transition strategy to move towards greener and cleaner energy solutions in a “fair” way. But in a growing country like India where millions of lives and livelihoods are directly or indirectly dependent on coal what does a ‘Just Transition’ mean?<sup>1</sup> It is important to understand what just transition means for India, especially to the communities, and detail the risks and opportunities therein as coal is an indispensable part of life in major coal-mining states like Odisha, Jharkhand, and Chhattisgarh, having deep-seated ties to the social, political, and economic systems.

It can be noted that 13 million people<sup>2</sup> are involved in the coal industry hence when we plan to repurpose coal assets, particularly land, it becomes important to keep a holistic approach in mind. For a coal-dependent community, land remediation and restoration represent a crucial opportunity for revitalization and sustainable development and it should be ensured that these coal-dependent communities are involved in the decision-making process.

Therefore, the transition from coal-dependent economies to sustainable energy sources presents both challenges and opportunities for communities reliant on coal in India. Most of these communities have already lost their

<sup>1</sup> <https://www.iddri.org/sites/default/files/PDF/Publications/Catalogue%20iddri/Rapport/201809-Synthesis%20Report%20iddri-COALTRANSITIONS-def.pdf>

<sup>2</sup> <https://www.nfi.org.in/sites/default/files/publication/cti.pdf>





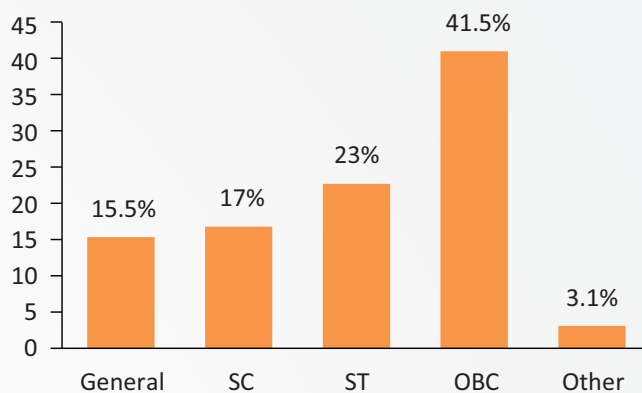
lands to mining activities and have a limited scope of work.

The key challenges are loss of livelihood, lack of new skills, economic disruption, and social displacement. During the survey it was noted that in almost all the coal mining areas the dependency on jobs is related to coal (either direct or induced). These challenges must be addressed while repurposing coal assets presenting a compelling opportunity for sustainable development and economic growth, aligning with global trends towards renewable energy and environmental stewardship. Given the country's abundant coal reserves and existing infrastructure in mining, power, and metallurgy, repurposing coal assets can leverage these resources for innovative and socially beneficial purposes.

In our ongoing study at the National Foundation for India, "The Human cost of transitioning from coal: A comprehensive study", we explore the dynamics of co-existence during this transition period, developing strategies for mitigating socio-economic impacts while fostering sustainable development in Chhattisgarh, Odisha, and Jharkhand.

**GIVEN THE COUNTRY'S ABUNDANT COAL RESERVES AND EXISTING INFRASTRUCTURE IN MINING, POWER, AND METALLURGY, REPURPOSING COAL ASSETS CAN LEVERAGE THESE RESOURCES FOR INNOVATIVE AND SOCIALLY BENEFICIAL PURPOSES.**

Our research and survey of 1200-plus households have revealed a stark disparity in community representation in these 3 states, with over 41.5% of the population surveyed belonging to Other Backward Classes (OBC), 23% to Scheduled Tribes (ST), and 17% to Scheduled Castes (SC). Interestingly, only 15.5% were from the General category, shedding light on the disproportionate impact of the transition on marginalized groups. The study was done in the villages lying in the core zone within the proximity of 0–20 km of coal mines and coal-allied industrial assets were taken into consideration.



Survey results of 1209 households in coal mining and coal dependent districts

Analysis of survey responses also indicated a clear correlation between caste and educational attainment, wherein households with only primary education or no education are more prominent among marginalized castes such as SCs/ STs/ OBCs. For example, in coal-producing districts such as Dhanbad and Koriya, nearly 57.5% and 52% of the marginalized communities had no formal education or had only primary education. While in Ramgarh, an overwhelming 78% of the marginalized communities reported having only primary or no education. Since education is directly related to empowerment as better education leads to a skilled labour force and hence more job security, this pattern is also worth noting. Education and awareness help communities to advocate for their rights and interests and is a tool and resource to help them articulate their needs and negotiate where needed. Hence, when the government plans to repurpose land, it becomes important to note the educational status of these communities so that informed decisions can be made.

Despite the government's repeated assertions for the sustainable mining extraction and development of rural and tribal communities living near the vicinity of mining areas, implementable solutions have been hard to come by.<sup>3</sup>

Through community consultations, participatory workshops and inclusive stakeholder meetings, we can provide a platform for marginalized groups to share their knowledge, priorities, and concerns regarding land restoration efforts starting from identification of degraded areas, to planning, monitoring and adaptive management while creating alternative livelihood.

<sup>3</sup> Coal Mining, Displacement and Rural Livelihoods: A Study in Mahanadi Coalfield Odisha-The Study was sponsored with the Financial Support of NITI Aayog, Government of India and Conducted by National Institute of Technology (NIT) Rourkela, Odisha



Creating opportunities for meaningful participation needs diverse perspectives and voices that are valued and respected and will lead to inclusive decisions and 'just' transition policies.

## Recommendations

One logical avenue for repurposing coal assets is the transition towards cleaner energy sources, particularly renewable energy. For example, Angul district's initiatives like the solar energy park<sup>4</sup> indicate a progressive approach towards harnessing alternative energy sources. Encouraging more renewables fosters economic growth, enhances energy security, and promotes environmental sustainability, positioning the district as a leader in the transition to a cleaner and more sustainable energy future. The district can not only reduce its carbon footprint but also capitalize on the growing market for clean energy solutions during the transition while combating climate change, stimulating economic growth, enhancing energy security, and engaging local communities in sustainable development initiatives. Moreover, repurposing coal assets can entail diversification into downstream industries that contribute to sustainable development. For instance, the development of an Aluminium Park<sup>5,6</sup> suggests a strategic shift towards value-added industries that utilize minerals like bauxite, which is often found in proximity to coal deposits.<sup>7</sup> By investing in downstream industries such as aluminium manufacturing, the district can create employment opportunities, attract investment, and foster technological innovation while reducing reliance on coal-centric activities.

While the transition and repurposing of the coal assets are being planned, it is important to recognize the rights and aspirations of marginalized and tribal communities whose lands have often borne the brunt of coal mining activities. As custodians of the land, tribal communities possess invaluable knowledge and insights that must be integrated into decision-making processes. Upholding the principles of informed consent and meaningful participation is essential to ensuring that the transition respects the dignity and autonomy of indigenous populations.

4 [https://cea.nic.in/wp-content/uploads/rpm/2023/11/Status\\_of\\_UMREPP\\_Solar\\_Parks.pdf](https://cea.nic.in/wp-content/uploads/rpm/2023/11/Status_of_UMREPP_Solar_Parks.pdf)  
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 7 <https://indianindustryplus.com/2024/02/22/odisha-the-land-of-opportunities/>

## MOREOVER, REPURPOSING COAL ASSETS CAN ENTAIL DIVERSIFICATION INTO DOWNSTREAM INDUSTRIES THAT CONTRIBUTE TO SUSTAINABLE DEVELOPMENT

One more option of land repurposing that coal and lignite Public Sector Undertakings (PSUs) have pursued in the past three years is developing eco-parks<sup>8</sup> on reclaimed land through sustainable mine closure practices. Some exemplary eco-parks in this regard are Utkal Upavan and Chandrashekhar Azad Eco Park by Mahanadi Coalfields Limited in Odisha, Kenapara Eco Park by South Eastern Coalfields Limited in Chhattisgarh and Govardhan Eco park and Parasnath Udyaan by Bharat Coking Coal Limited in Jharkhand. As per the government records, over the last five years (from FY 2019-20 to FY 2023-24), the Ministry of Coal,<sup>9</sup> Coal India Limited and its subsidiary have successfully established 16 Eco-Parks/Mine Tourism sites with 7 such sites seamlessly integrated into the local tourism circuit.<sup>10</sup>

## ओबी डंप पर बने पारसनाथ उद्यान का हुआ ऑनलाइन उद्घाटन, 1000 पौधे लगाए गए

गृहमंत्री व कोयला मंत्री ने पार्क को उद्घाटन के बाद किया संबोधित, पौधरोपण की अपील



A newspaper clip from the launch of Parasnath Eco Park in Jharkhand

These reclaimed mining sites are now stable, environmentally sustainable, and visually stunning, showcasing the successful transformation of previously

8 <https://www.radiancemedia.in/news-details.php?more=15-Eco-Parks-constructed-in-five-years-by-Coal-and-Lignite-PSUs-and-19-more-planned-in-different-states>  
 9 <https://coal.gov.in/en/sustainable-development-cell/eco-tourism-in-mining-area>  
 10 <https://pib.gov.in/PressReleaseframePage.aspx?PRID=2010082>



mined areas. Some of these eco-parks have already been seamlessly integrated into local tourism circuits, attracting visitors and contributing to the local economy. Coal and lignite PSUs are actively collaborating with respective State tourism departments to further integrate these parks into the broader tourism infrastructure.

Providing access to resources and training opportunities is essential for overcoming barriers to participation faced by marginalized communities. This may include offering financial support, technical expertise, and capacity-building initiatives tailored to the specific needs of different groups. By investing in skills development and empowering local leaders, communities can build their capacity to actively contribute to restoration planning and implementation processes.

Promoting participatory approaches to restoration planning and implementation is another critical aspect of addressing social hierarchies. Participatory methodologies such as participatory mapping, community-led research, and collaborative decision-making enable communities to take ownership of the restoration process and shape interventions that reflect their values and aspirations. By fostering a sense of ownership and agency among community members, participatory approaches can enhance the effectiveness and sustainability of land restoration efforts.

**FOR ANY COAL ASSET REPURPOSING INCLUDING LAND, A COMMITMENT TO EQUITY, INCLUSION, AND COMMUNITY EMPOWERMENT IS FUNDAMENTAL TO ADDRESSING SOCIAL HIERARCHIES**

## Enabling a Just Transition

Addressing underlying power dynamics that perpetuate inequality within communities is essential for achieving meaningful social change through land restoration. Tribal and local communities often possess valuable knowledge and practices related to land management and restoration. Acknowledging and incorporating this knowledge into restoration projects will not only improve their effectiveness but also empower these communities and challenge existing power imbalances. It also demonstrates respect for traditional ways of life and

**PARTICIPATORY METHODOLOGIES SUCH AS PARTICIPATORY MAPPING, COMMUNITY-LED RESEARCH, AND COLLABORATIVE DECISION-MAKING ENABLE COMMUNITIES TO TAKE OWNERSHIP OF THE RESTORATION PROCESS AND SHAPE INTERVENTIONS THAT REFLECT THEIR VALUES AND ASPIRATIONS.**

strengthens the role of marginalized groups in decision-making processes.

This may involve challenging traditional hierarchies and redistributing decision-making authority to more equitable structures, such as community-based organizations or participatory committees. Participatory committee is an enabled unofficial body in any community involved in decision-making processes, planning, and implementation, power dynamics can be shifted to ensure that all voices are heard and considered. Being involved throughout the process fosters a sense of ownership among community members, enabling them to shape the direction of land restoration efforts and address issues of inequality. Empowering marginalized groups to assert their rights and interests is essential for creating inclusive and just outcomes in the restoration process.

For any coal asset repurposing including land, a commitment to equity, inclusion, and community empowerment is fundamental to addressing social hierarchies. Redistributing decision-making authority and leadership roles within restoration initiatives can challenge the existing power dynamics. Voicing the marginalized communities and ensuring their representation in governance structures is decentralized. Promoting participatory approaches, having access to resources, adequate training, accountability, and transparency will lead to proper restoration efforts like eco-parks,<sup>11</sup> and fisheries in abandoned mines<sup>12</sup> and will foster social justice and create lasting positive impacts for both people and the environment.

11 <https://www.radiancemedia.in/news-details.php?more=15-Eco-Parks-constructed-in-five-years-by-Coal-and-Lignite-PSUs-and-19-more-planned-in-different-states>

12 <https://www.newindianexpress.com/good-news/2022/Apr/04/abandoned-coal-mines-in-jharkhands-ramgarh-now-haven-for-fish-farming-2437641.html>





### Addressing Power Dynamics

Empowering marginalized groups to assert their rights and interests is essential for achieving justice and inclusivity in the restoration process.

### Actively Engaging Marginalized Groups

Land restoration initiatives should actively involve marginalized groups, including indigenous communities, women, and low-income households, in decision-making processes. This involves creating inclusive spaces for dialogue and participation, where diverse perspectives and voices are valued and respected.

### Providing Access to Resources and Training Opportunities

To overcome barriers to participation, marginalized groups must be provided with access to resources such as funding, technical expertise, and training opportunities. This may include offering capacity-building workshops, providing grants or microloans for community-led projects, and facilitating partnerships with local organizations or government agencies.

### Prioritizing Social Justice and Inclusivity

By prioritizing principles of social justice and inclusivity, land restoration efforts can contribute to sustainable development and environmental stewardship for all members of the community. This involves recognizing and addressing historical injustices, ensuring equitable access to benefits and opportunities generated by restoration projects, and fostering solidarity and cooperation among diverse stakeholders.

### Promoting Participatory Approaches

Adopting participatory approaches to restoration planning and implementation ensures that community members have a meaningful say in shaping the direction of projects. This can involve conducting community consultations, participatory mapping exercises, and collaborative decision-making processes to identify priorities, set goals, and design interventions that reflect local needs and aspirations.

If these transitions are not addressed properly, marginalized, and vulnerable communities may experience further marginalization and exclusion from mainstream society. Their already limited resources like land and other opportunities may diminish even further, leading to deepening poverty, social unrest, and environmental degradation.

Hence, addressing social hierarchies in the land restoration process requires a holistic and inclusive approach that prioritizes equity, inclusion, and community empowerment. By actively engaging marginalized groups, providing access to resources, and training opportunities, promoting participatory approaches, restoration efforts can create positive social impacts and contribute to a more just and sustainable future for all.



# COAL SECTOR – JUST TRANSITION IN INDIA

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WCL opencast coal mine in Chhindwara, Maharashtra (Source: Flickr)

India, being a signatory to the Paris Agreement, is bound to implement activities for addressal of issues arising out of climate change. Though a developing economy, where the priority for the Government is still poverty alleviation, employment and energy security, it is difficult for India to tread on a path totally devoid of fossil fuels. In spite of this, India has submitted an ambitious NDC targets to the UNFCCC for reduction of its GDP's emission intensity to 45% by 2030 from 2005 level, and 50% installed RE capacity. India's achievement, so far, in this direction has been quite remarkable.

As per India's national circumstances, energy transition absolutely away from coal is unlikely. It is expected that

growth in the coal sector will be tepid but likely to remain about 1.40 billion tonnes or so upto 2047 and beyond. It is very likely that in the future, a few mines may undergo closure on account of resource exhaustion, unviability or some other issues. The mine closure guidelines issued by the Government of India, is inclusive of social impacts, arising out of closure and regular employees in coal companies are gainfully deployed in other mines or being suitably compensated. But the high dependence of the local community, suppliers, contractors and induced manpower on the coal ecosystem means that coal mine closure would greatly impact them. As per an estimate, close to 4 million people are either directly or indirectly



employed by the coal mining sector (Pai, 2021). The number of induced jobs has not been quantified but is likely to be significant in coal-dependent regions. While we move away from coal though slowly, the transition for these communities, dependent on coal ecosystem, needs to be just and duly accounted for to provide sustainable livelihood.

The contribution of coal to the national economy is immense. CIL alone contributes to over USD 10 billion in the form of taxes, royalties, coal cess, DMFT and NMET, CSR, employee welfare, etc. Even the rail ecosystem is dependent on the fares charged for coal transportation. Just transition in India is more complex and needs to be based on national circumstances rather than on global practices.

We need to undertake a detailed socio-economic survey of the affected communities, extensive stakeholder's consultation and adopt a pragmatic approach towards skilling, reskilling, upskilling of communities and creation of job opportunities in the affected regions at the local level itself. The Governments need to be pro-active in such efforts and the help of coal companies will be crucial in achieving the just transition goals. The planning for just transition may be started at the time final mine closure plans are being prepared for the mines and a separate agency shall be required to implement the just transition activities.





# EVENT SECTION

## Just Transition Framework for a Sustainable Future in India's Coal Mining Regions | WSDS 2024 | New Delhi|



Launch of the Just Transition Framework report

The 23rd edition of the World Sustainable Development Summit (WSDS) in New Delhi focused on 'Leadership for Sustainable Development and Climate Justice'. The Electricity and Renewables Division organized a thematic session on the 'Just Transition Framework for a Sustainable Future in India's Coal Mining Regions' and the framework report was released by Mr. Amrit Lal Meena, Secretary of the Ministry of Coal, Government of India.

The framework has its theoretical basis in the concept of procedural, distributive and restorative justice and combines it with actionable strategies for socio-economic and environmental resilience. It systematically charts stakeholders, delineates challenges, sets benchmarks for progress, and aligns with India's goal for net-zero emissions by 2070. Mr. Amrit Lal Meena also

highlighted innovative initiatives by Coal India Limited like repurposing mine lands for energy storage and maximizing solar energy adoption.

A panel discussion on the thematic track followed which was moderated by Mr. Jiwesh Nandan, Distinguished Fellow TERI. The experts included:

1. Prof. Binay Dayal, former Director (Technical) CIL & Adjunct Professor, IIT(ISM) Dhanbad
2. Ms. Sabina Dewan, President and Executive Director, JustJobs Network
3. Mr. Ashim Roy, General Secretary, Hind Mazdoor Kisan Panchayat
4. Mr. Vinod K Pandey, GM (Environment), CMPDI(HQ)
5. Mr. Madhuban Pandey, Co-Founder, SCORE Livelihood Foundation.



The panelists at the WSDS event



Prof. Binay Dayal speaking during the panel discussion





## Just Transition: Future of Coal & Pathways to Low Carbon Footprint |31 January, 2024| Kolkata



The speakers of the TERI- IIT(ISM) Dhanbad seminar

TERI, in partnership with the Indian Institute of Technology (Indian School of Mines), Dhanbad, hosted a seminal national seminar on "Just Transition: Future of Coal & Pathways to Low Carbon Footprint" in Kolkata on January 31, 2024. This pivotal seminar brought together leading figures from the energy sector, academia, and policymaking to discuss the pathways for India's energy transition from coal to sustainable alternatives. It served as a dynamic forum for examining innovative solutions for the reutilization of coal mines, green support for coal-dependent MSMEs, and the development of a sustainable, equitable transition framework. The discussions were underpinned by the urgent need for a Just Transition, focusing on safeguarding community and worker welfare amid the move from coal, and included debates on policies for retraining, social protection, and fostering job growth in new, green industries. The seminar's agenda was thoughtfully designed around thematic sessions on repurposing closed mines, enhancing economic competitiveness alongside environmental sustainability, and opportunities for reskilling in green jobs. A concluding plenary session dedicated to co-creating actionable strategies for a resilient, low-carbon future in the coal sector underscored

the event's commitment to aligning with the Prime Minister's Panchamrit principle for energy independence and sustainability, marking a critical leap towards India's greener tomorrow.



Mr. Partha S. Bhattacharyya, Former Chairman, Coal India Limited, addressing the seminar



The seminar had a structured agenda that included an introductory session, Thematic session I: Repurposing of closed mines and diversification of the local economy, Thematic session II: Balancing Economic Competitiveness and Environmental Sustainability: Green Transition for Coal Dependent MSMe's, Thematic session III: Reskilling and Upskilling for Green Jobs - Opportunities as the Coal Sector Transitions to a Low-Carbon Economy and Plenary session: Charting a Sustainable Path: Co-Creating Action for a Low-Carbon, Resilient Future in the coal sector.



Dr. Vinita Arora delivering her presentation



Dr. Ernesto Noronha addressing the seminar



Mr. Vikas Varshney addressing the seminar



# PHOTO ESSAY

## Living with coal in Giridih

TERI in partnership with the SCORE Livelihood Foundation is carrying out a pilot project for women empowerment among villages in the vicinity of coal mines that are about to be closed/are already closed. These villages are in the vicinity of Kabribadh and Giridih Open Cast Mines and see a considerable proportion of their residents relying on the sale of pilfered coal for income and sustenance.

It is a common sight for locals to dig tunnels on the peripheries of coal mines and make their own way to the coal seams – much in the manner of artisanal and small-scale mining, also called rat hole mining in Meghalaya. Groups of men also throng the sides of overburden dumps waiting for mining company trucks to dump mining refuse. They then sift through the dump to find coal good enough for sale.

Retrofitted cycles and motorbikes laden with big sacks of coal weighing at least 4 quintals (400 kilograms) are a common sight on the roads and streets of Giridih. Discussions with villagers revealed that at least one person from every household on average is involved in the supply and sale of pilfered coal. The great weight of coal transported on two wheelers requires people to spend upto INR 8000 to retrofit the vehicle with bigger shockers and extra gear to enable its movement. This coal is sold to dhabas and local households for brick production or domestic purposes like cooking. During the monsoons, these activities become more treacherous and groups of people from the nearby villages migrate to metro cities like Kolkata, Delhi, Mumbai, etc., earning a livelihood as construction workers for that season when coal pilfering is unviable. The money they can save is brought back for their families.

The abundance of easily available coal allows local households to engage in household level brick production. A brick kiln in every house compound is a common sight in these villages and coal is used for firing the bricks. Many times, the operation of brick making sees the involvement of the whole family – even young children – in setting up the pile of bricks for firing.

Local women also leave their homes to fetch coal from the abandoned/closed coal mine and its vicinity to save expenditure on LPG cylinders. This search leads them anywhere between 2 and 5 km from their homes equipped with their pickaxes, shovels, and gunny bags. After spending a few hours picking at the ground where coal mining overburden is dumped or on the edges of the abandoned/discontinued coal mine they walk back home with an upwards of 70 kilograms of coal balanced on their heads along with their tools.

These examples are a bird's eye view of how pervasive the reliance on coal is in regions with major reserves of the mineral. For locals it is a way of life and for many, a crucial source of income – rendered vulnerable as they are by social marginalization and economic backwardness, forcing them to resort to risky measures to earn their livelihoods. Little grows on this land which has seen the extraction of coal from pre-independence times over many generations, leading to the restriction of economic choices. In the absence of additional skills and resources, locals often become dependent on coal despite the associated risks. In a way, availability of this mineral in abundance, easy access and local demands create a climate conducive for illegal coal mining to thrive.

(Photo Essay credits: Arpita Victor)







Photo 1: This retrofitted bike can bear the weight of 4 quintals of pilfered coal. The rider will transport the coal to neighbouring towns and villages to sell the coal to willing buyers, often local dhabas.



Photo 3



Photo 2: The big shockers and rods attached to the motorbike are crucial to support the weight of coal transported.



Photo 4: Kamla Devi sorting pieces of coal by size to use them accordingly in the brick kiln that she and her husband have erected in the backyard of their home (see Photo 3). She also enjoys tailoring and stitching through which she provides her services to customers in the village.







Photo 5



Photo 6: Men loading coal-fired bricks to be sold at the market for a profit.



Photo 7: Sheena Parveen, a 6th grade student stands on top of a pile of unfired bricks belonging to her family. When asked why she didn't go to school, she said her father told her to stay home and help them finish erecting their pile of bricks to be fired using locally bought coal.







Photo 8



Photo 10: Kabribad open cast mine, with pilfered coal gathered in the foreground. Locals venture into one side of the coal mine to fetch coal while the other side sees continuing official mining activities, as seen in Photo 8.



Photo 9: Partial firing of coal is done to earn a better price for the coal in the market. The thick smoke indicates the poor quality of coal.



Photo 11: One of numerous treacherous tunnels dug into the ground surrounding the Giridih Open Cast mine, the overburden pile of which is seen in the background. In monsoons these tunnels are notoriously flooded leading to accidents seeing people get buried under the unstable land surface.







Photo 12: Local men waiting near the overburden dump of Giridih Open Cast mine, for the dumping trucks to arrive so they can sift through the debris for coal they can sell.



Photo 14: Crudely made tools used by locals when fetching coal to dig out and break chunks of coal



Photo 13: A woman picking at the surface of the overburden dump for coal to take home. The group of men in Photo 12 is in the background.



Photo 15: The unwieldy surface of land around the coal mine is marked by evidence of subsidence. This same geography is witness to rat hole like tunnels dug into the ground by locals to mine coal themselves as seen in Photo 11.













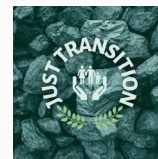
Local women carrying coal collected from the sides of overburden from the Giridih Open Cast Coal Mine in Giridih. (Photo Credit: Arpita Victor)

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