



# Livelihood opportunities for a Just Transition in Jharkhand

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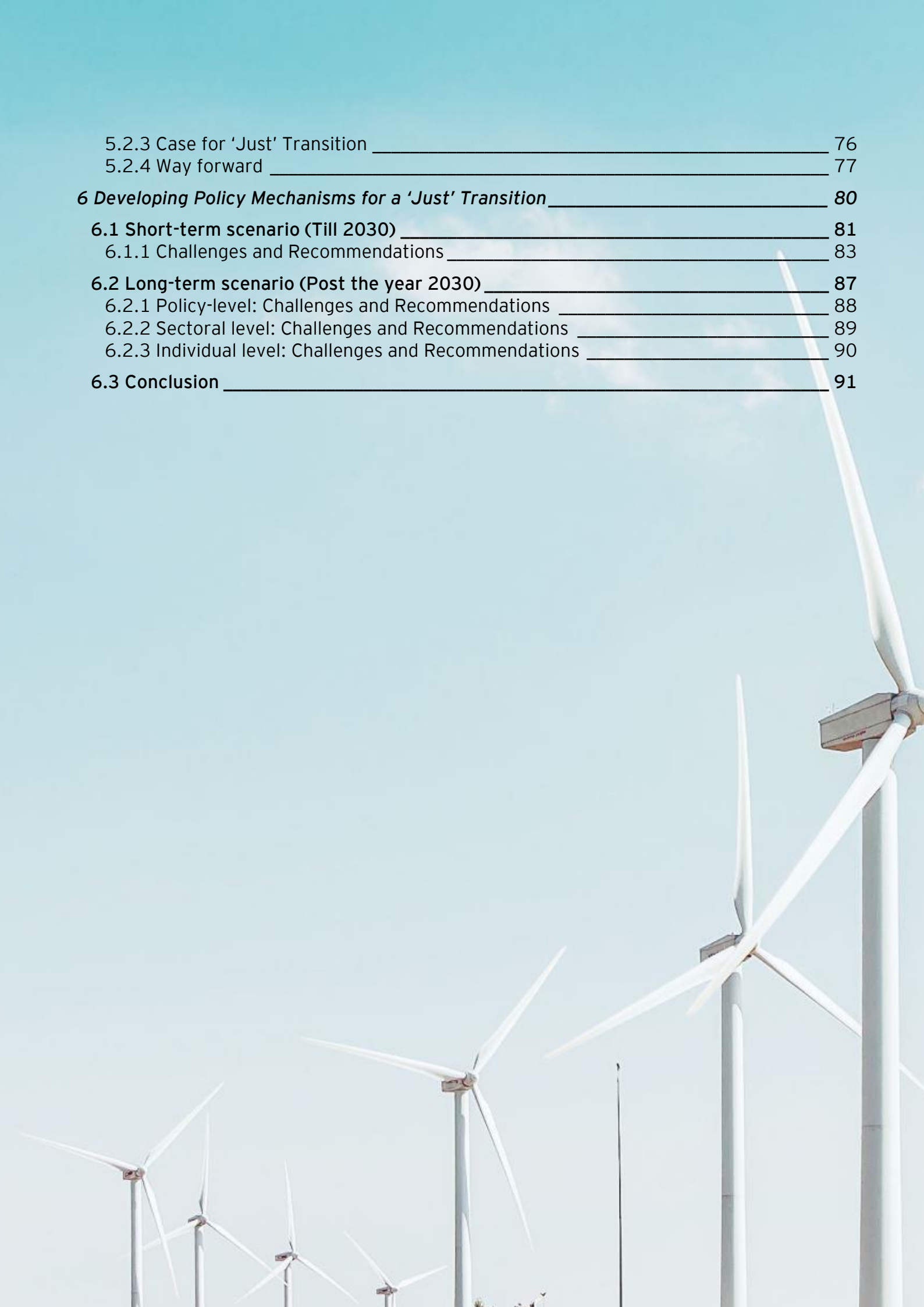
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## Table of Contents

<b>Executive Summary</b>	<b>7</b>
<b>1 Introduction to the research</b>	<b>15</b>
1.1 Background and objectives	15
1.2 Approach	17
1.3 Methodology	17
1.4 Sample distribution and coverage	19
1.4.1 Coal sector workers	19
1.4.2 Supply, demand, and policy-side stakeholders	19
1.5 Limitations of the research	21
<b>2 Overview: Understanding 'Just' Transition</b>	<b>23</b>
2.1 India's Net Zero commitments	23
2.2 Coal mining in India	25
2.2.1 Coal consumption trends	25
2.2.2 Coal industry in Jharkhand	26
2.3 Need for a 'Just' Transition in Jharkhand	29
<b>3 Profile of coal sector workers</b>	<b>34</b>
3.1 Socio-economic profile	34
3.2 Employment details	41
3.3 Health and well-being	46
<b>4 Demand, Supply, and Policy Level Findings</b>	<b>50</b>
4.1 Coal demand and supply in Jharkhand	50
4.2 Perception of coal phase-down	52
4.3 Adaptive Capacity and Financial Stability of Workers	59
4.4 Potential for Renewable Energy and impact on Workforce	63
4.5 Alternate Skilling and Employment Opportunities	65
<b>5 Learnings and Best Practices - International and National</b>	<b>71</b>
5.1 Learnings from other geographies - International	71
5.1.1 South Africa	71
5.1.2 United States of America	71
5.1.3 Germany	72
5.1.4 Poland	72
5.1.5 Canada	72
5.1.6 Ukraine	72
5.1.7 Indonesia	73
5.2 Learnings from Giridih District, Jharkhand - National	74
5.2.1 Background and context	74
5.2.2 Impact on coal sector workers in Giridih	75

5.2.3 Case for 'Just' Transition	76
5.2.4 Way forward	77
<b>6 Developing Policy Mechanisms for a 'Just' Transition</b>	<b>80</b>
<b>6.1 Short-term scenario (Till 2030)</b>	<b>81</b>
6.1.1 Challenges and Recommendations	83
<b>6.2 Long-term scenario (Post the year 2030)</b>	<b>87</b>
6.2.1 Policy-level: Challenges and Recommendations	88
6.2.2 Sectoral level: Challenges and Recommendations	89
6.2.3 Individual level: Challenges and Recommendations	90
<b>6.3 Conclusion</b>	<b>91</b>



## List of Figure s

Figure 1: India's CO <sub>2</sub> emissions in 2020, categorised by type of fuels .....	15
Figure 2: Diagrammatic representation of methodology adopted for conducting this research .....	17
Figure 3: Concentration of coal mines and thermal power plants in Jharkhand.....	18
Figure 4: State-wise inventory of geological resources of coal in Gondwana Coalfields of India as of 1st April 2021 .....	27
Figure 5: State-wise production (MT) and value (Billion Rs) of coal during 2020-21.....	28
Figure 6: Social groups of coal sector workers .....	34
Figure 7: Number of household members of coal sector workers.....	35
Figure 8: Number of dependent household members of coal sector workers .....	35
Figure 9: Gender distribution of organised coal mine workers .....	35
Figure 10: Gender distribution of thermal power plant workers .....	36
Figure 11: Age distribution of organised coal mine workers .....	36
Figure 12: Age distribution of thermal power plant workers.....	37
Figure 13: Education levels of organised coal mine workers.....	38
Figure 14: Education levels of thermal power plant workers .....	38
Figure 15: Gender distribution of unorganised coal sector workers .....	39
Figure 16: Age distribution of unorganised coal sector workers .....	40
Figure 17: Education levels of unorganised coal sector workers .....	40
Figure 18: Reasons coal sector workers prefer working for their current employers .....	41
Figure 19: Duration of employment of organised coal mine workers .....	42
Figure 20: Duration of employment of thermal power plant workers .....	42
Figure 21: Duration of employment of unorganised coal sector workers .....	43
Figure 22: Daily working hours of organised coal mine workers.....	44
Figure 23: Daily working hours of thermal power plant workers .....	44
Figure 24: Daily working hours of unorganised coal sector workers.....	45
Figure 25: Frequency of remuneration among coal mine workers.....	45
Figure 26: Frequency of remuneration among thermal power plant workers.....	45
Figure 27: Frequency of remuneration among unorganised coal sector workers .....	45
Figure 28: Health issues faced by organised and unorganised coal mine workers owing to working in coal mines .....	47
Figure 29: Health issues faced by thermal power plant workers owing to working in thermal power plants.....	47
Figure 30: Coal sector workers who had information about the closure of coal mines in their vicinity .....	53
Figure 31: Coal sector workers who had information about the closure of thermal power plants in their vicinity.....	53
Figure 32: Workers' perception around coal mine closures in their vicinity.....	54
Figure 33: Type of information received by workers from their employers regarding the future of their employment .....	57
Figure 34: Duration for which coal mine workers' savings will last to sustain themselves before they find alternate employment .....	60
Figure 35: Duration for which thermal power plant workers' savings will last to sustain themselves before they find alternate employment.....	61
Figure 36: Duration for which unorganised coal workers' savings will last to sustain themselves before they find alternate employment .....	62
Figure 37: Jharkhand Industrial and Investment Promotion Policy 2021 .....	66
Figure 38: Willingness of organised coal mine workers to migrate, in case of mine closures .....	67
Figure 39: Willingness of thermal power plant workers to migrate, in case of thermal power plant closures .....	68
Figure 40: Willingness of unorganised coal sector workers to migrate, in case of mine closures .....	68
Figure 41: List of personnel involved in managing Giridih coal mines since the inception .....	74
Figure 42: Kabribad open cast project of CCL in Giridih district .....	75
Figure 43: Short-term mapping of challenges and recommendations across policy, sectoral, and individual levels.....	82
Figure 44: Long-term mapping of challenges and recommendations across policy, sectoral, and individual levels .....	87



## List of Abbreviations

ACC - Assistance to Coal Communities Act  
BCCL - Bharat Coking Coal Limited  
BT - Billion Tons  
CCL - Central Coalfields Limited  
CEA - Central Electricity Authority  
CIL - Coal India Limited  
CMPDI - Central Mine Planning and Design Institute  
CO<sub>2</sub> - Carbon Dioxide  
COP26 - United Nations Climate Change Conference  
CSR - Corporate Social Responsibility  
CTO - Consent To Operate  
DMF - District Mineral Foundation  
EC - Environmental Clearance  
EIR - East India Railway  
EO - Environment Officer  
EOI - Expression of Interest  
FGDs - Focus Group Discussions  
G20 - Group of Twenty (international economic cooperation group)  
GW - Gigawatt  
ICRA - Investment Information and Credit Rating Agency India  
IDIs - In-Depth Interviews  
IEA - International Energy Agency  
INR - Indian Rupee  
IPG - International Partners Group  
JETP - Just Energy Transition Partnership  
JREDA - Jharkhand Renewable Energy Development Agency  
JT - Just Transition  
MDB - Multilateral Development Bank  
MSME - Micro, Small, and Medium Enterprises  
MSOP - Management Skills Orientation Program  
MT - Million Tons  
MW - Megawatt  
NDC - Nationally Determined Contribution  
NGO - Non-Governmental Organisation  
NTFP - Non-Timber Forest Product  
OCP - Open Cast Project  
PO - Project Officer  
POWER - Partnerships for Opportunity and Workforce and Economic Revitalization  
RE - Renewable Energy  
RGO - Renewable Generation Obligation  
SDG - Sustainable Development Goals  
UNFCCC - United Nations Framework Convention on Climate Change  
USD - United States of America Dollar





## Executive Summary

India set the target for achieving net zero by 2070, at COP26 in 2021; with a focus on a 'coal phase down' approach as opposed to a 'coal phase out'. During COP27, held in November 2022, India released a national report focused on the country's long-term low-emission development strategy to the United Nations Framework Convention on Climate Change (UNFCCC). The key emphasis was on **transitioning from fossil fuels in a just, smooth, sustainable, and all-inclusive manner**. The country also updated its **Nationally Determined Contributions (NDCs)** in 2022, which it aims to achieve by 2030 to reflect a "coal phase down" approach. Through its NDCs, India has committed to **meeting 50% cumulative electric power installed capacity from non-fossil fuel-based energy resources** and to reducing the emission intensity of its GDP by 45%, from the 2005 level. India's pronouncements at COP27 and in the revised NDCs highlight the country's commitment towards transitioning from fossil fuels like coal, in a just manner.

Along with its commitment to global normative frameworks, India has brought various domestic policy measures that align with the goal of phasing coal down, key among these are as follows:

- ▶ The draft **National Electricity Plan for 2022-27**, through which the Government expects domestic coal requirement to touch 1018.2 MT by 2031-32.<sup>1</sup>
- ▶ According to the Plan, the Government intends to **retire coal-based capacity totalling 4,629 MW between 2022 and 2027**
- ▶ The Plan also indicated **retiring old and inefficient power plant units that cannot undergo renovation and modernization**, to reduce carbon emissions
- ▶ The **Green Energy Open Access Rules** were released in 2022 to make it easier for consumers to access green power by promoting the generation, purchase, and consumption of green energy
- ▶ As per a notification released by the Government on 6 March 2023, **India has introduced a "Renewable Generation Obligation (RGO)"** that requires all new coal-based power plants to obtain 40% of their capacity from renewable energy sources.

Despite the policy measures and India's emphasis on the adoption of renewable energy sources, **the Central Electricity Authority (CEA) of India recently instructed power utilities not to decommission any thermal units until 2030**. The **lack of clarity in policy measures and misalignment in the policy and actions** goes to impact the country's net zero commitments; subsequently acting as a challenge for states to plan for a 'just' transition.

The coal sector is a key driver of the Indian economy and the country's carbon emissions was close to 7% (of all carbon emissions in the world) in 2020.<sup>2</sup>

- ▶ **Royalties from the coal sector account for a significant portion of the Government's annual revenue at the Centre (almost 3%) and State levels (almost 8% in Jharkhand, the eastern province with the highest number of coal mines in the country).**<sup>3</sup>
- ▶ Organised and unorganised workers are dependent on this sector for their sustenance and livelihoods across multiple states in the country
  - As one of the largest players in the coal sector, **Coal India Limited itself generates employment for approximately 725,000 direct workers in the country**, with an undisclosed number of indirect employment<sup>4</sup>
  - **It has been estimated that there are more than 13 million people indirectly dependent on the coal sector in India, and a majority of them are concentrated in the highest coal-producing states such as Jharkhand.**<sup>5</sup> Jobs of indirect workers include trucking, and other coal-induced jobs, such as restaurant workers serving coal workers in the mining regions.

**A coal phase-down threatens the livelihoods of these workers and communities**, along with the revenues of different state governments. The impact of such a phase-down will be higher for states with a large number of mines and high levels of coal production.

<sup>1</sup> [https://cea.nic.in/wp-content/uploads/irp/2022/09/DRAFT\\_NATIONAL\\_ELECTRICITY\\_PLAN\\_9\\_SEP\\_2022\\_2-1.pdf](https://cea.nic.in/wp-content/uploads/irp/2022/09/DRAFT_NATIONAL_ELECTRICITY_PLAN_9_SEP_2022_2-1.pdf)

<sup>2</sup> <https://ourworldindata.org/co2/country/india?country=~IND>

<sup>3</sup> [https://justtransitioninitiative.org/wp-content/uploads/2021/10/CoalDependentCommunities\\_Report.pdf](https://justtransitioninitiative.org/wp-content/uploads/2021/10/CoalDependentCommunities_Report.pdf)

<sup>4</sup> <https://ficci.in/spdocument/23589/studies.pdf>

<sup>5</sup> <https://www.nfi.org.in/sites/default/files/publication/cti.pdf>



As on March 2021, Jharkhand has 113 operational mines that account for over one-fourth (26%) of all coal mines in the country and generate more than 115 MT of coal every year.<sup>6</sup> In terms of employment, the coal mining industry in Jharkhand supports nearly 300 thousand (283,737) direct coal mining jobs, 38% of all such jobs in India.<sup>7</sup> The coal economy of Jharkhand requires further research and analysis to identify and ensure that the direct and indirect livelihoods depending on the coal sector, are not unfairly impacted by an inevitable coal phase down, i.e., their transition out of the sector is 'just' in nature.

**This report aims at understanding the implications of an energy transition in Jharkhand, with a focus on alternate livelihoods for coal sector workers.** The study encapsulates the perception around an energy transition from a supply, demand, and policy perspective, and provides recommendations for short-term and long-term coal phase-down scenarios, which will lead to inclusive and sustainable growth for workers working in the coal sector.

The study adopts a mixed methodological approach, with **extensive primary research with stakeholders most likely to be impacted by the phase-down, supplemented with in-depth secondary research with key stakeholders.**

- ▶ A state-level survey with organised and unorganised coal sector workers, working in the mines and thermal power plants across five districts of Jharkhand (Ramgarh, Ranchi, Bokaro, Dhanbad, and Chatra) was conducted with 6,000 workers, compounded by 20 focus group discussions.
- ▶ Opinions of policymakers and sectoral experts working at the national and state levels were gathered through 26 in-depth interviews.

Analysing the projected energy transition in the Indian context, and in relation to the coal sector in the country is key to prefacing an examination of a coal phase-down and its impact on workers. Research shows that coal consumption and production is likely to peak between 2030 and 2035, and it is only after this peak will the demand and supply of coal begin falling.<sup>8</sup> **Despite India's strong policy directives at the national level promoting a coal phase-down, two divergent schools of thought emerged across stakeholder groups in this research:**

- ▶ Action on an energy transition is not needed unless there is a drastic change in the coal landscape
- ▶ Energy transition activities should be adopted regardless of the present and future situation of increase in coal production, given that small and underground mines located in isolated pockets are on the verge of closures and it will be beneficial to plan for large mine-closures during this time, which are imperative in the future

In adopting either of the above strategies, it is imperative to derive a better understanding of the coal sector workers, both organised and unorganised, as they form an important part of this sector and will be the target beneficiaries of energy transition interventions. The profile of coal sector workers facilitated an understanding of the on-ground situation, which was taken into account while providing recommendations for a 'just' transition.

## Profile of workers



### Socio-economic status

- ▶ The labour force of the industry is heavily male-dominant, with over 81% male workers, falling predominantly in the age bracket of 30-45 years (49% of all organised coal mine workers, 45% of all organised thermal power plant workers, and 49% of all unorganised coal sector workers)
- ▶ Most workers were native to Jharkhand - with 57% having 4-6 family members and 46% having 2-4 dependents - demonstrating the centrality of the coal industry to livelihoods in the region.
- ▶ While over a third of (34%) organised workers had received at least primary level education, a similar ratio (35%) of unorganised workers were not formally educated. On the other hand, 38% of workers had completed secondary education and graduated, revealing the limited economic scope for the application of higher education in the region.

<sup>6</sup> <http://www.coalcontroller.gov.in/writereaddata/files/download/coaldirectory/CoalDirectory2020-21.pdf>

<sup>7</sup> A novel dataset for analysing sub-national socioeconomic developments in the Indian coal industry (iop.org)

<sup>8</sup> 2020 International Energy Agency (IEA) report & <https://www.raponline.org/wp-content/uploads/2020/07/RAP-Indias-energy-transition-july-2019-FINAL.pdf>



## Profile of workers



### Employment details

- ▶ One-third (33%) of workers reported having been working in the coal sector for over a decade, due to a lack of other employment opportunities nearby
- ▶ Owing to the non-availability of an official contract, the jobs of most coal sector workers were found to be insecure
- ▶ The payment cycle was mostly consistent for organised coal sector workers, as they received their salary monthly; while the trends differed for unorganised coal sector workers, who received their wages mostly on a daily or weekly basis



### Health and overall well-being

- ▶ Coal sector workers indicated suffering from illnesses like tuberculosis, asbestosis, occupational cancer, chronic obstructive pulmonary disease, silicosis, etc.
- ▶ Workers across all categories voiced issues relating to dust, lack of other safety measures, and others

The Ministry of Coal of the Government of India and the World Bank have estimated that 56 larger open-cast mines<sup>9</sup> will meet the production target of 1 billion tons of coal, by 2023-24.<sup>10</sup> In addition to the coal production target, more thermal power plants are being commissioned in and around the country, which is further going to drive demand for coal, at least in the short term. According to an internal document from the Power Ministry, power plants in India that are dependent on imported coal have been directed to operate at maximum capacity through the utilisation of an emergency law. This move comes in anticipation of an expected peak in power consumption during the summer, which is expected to break previous records.

Given such an increase, most stakeholders, ranging from policymakers and sectoral experts to coal sector workers, denied the possibility of a coal phase-down in the short term. This underscores that, even while the share of coal generation will decline eventually, it will remain significantly high in the coming decade. Ultimately, Jharkhand will need to align its policies with the Centre to avoid unnecessary socio-economic shocks to those intertwined with the coal sector.

Since a phase-down is in the strategic pipeline to actualize India's green commitments for achieving net zero emissions, its implications on livelihoods dependent on the coal sector need to be weaved into the strategic frameworks and policy directives. This is critical as there is a lack of awareness on the ground regarding national-level strategic commitments and paradigm shifts. Among all workers, 59% did not have any information about the closure of coal mines and 87% did not have any information about the closure of power plants in their vicinity.

- ▶ While a vast majority of the workers were unaware of any developments in the coal sector (only 14% of workers were aware of any Government plans for reducing the production of coal in the future), the awareness levels were slightly poorer among unorganised workers. Hence, the lack of requisite channels makes unorganised workers more vulnerable to shocks and inhibits them from staying informed and being prepared.
- ▶ Workers who had information about coal mine closures did not find such incidents to have real-time implications and be a cause of concern, since 46% of those workers found such closures to be a frequent and usual occurrence in the coal sector and 20% believed that such information tended to be untrue and perceived them to be rumors.
- ▶ Nonetheless, others strongly expressed concerns about their potential employability in alternate sectors due to a lack of education, skills, and opportunities around the mines.

<sup>9</sup> World Bank presentation to the Ministry of Coal for providing Support to Achieving a Just Transition in India's Coal Sector

<sup>10</sup> [https://cea.nic.in/wp-content/uploads/irp/2022/09/DRAFT\\_NATIONAL\\_ELECTRICITY\\_PLAN\\_9\\_SEP\\_2022\\_2-1.pdf](https://cea.nic.in/wp-content/uploads/irp/2022/09/DRAFT_NATIONAL_ELECTRICITY_PLAN_9_SEP_2022_2-1.pdf)



Upon delving deeper, the **adaptive capacity of workers was observed to be heavily reliant on their transferable skills and their finances.**

- ▶ Evidence of financial precarity of coal sector workers underlined the argument that there is a need for action and support with regard to the re-employment of all workers, organised and unorganised, within a month of any closures of coal mines and thermal power plants. It was found that **35% workers did not have any savings to provide a small buffer** in the case of an immediate cessation of their current employment in the coal sector.
- ▶ Though workers remained optimistic about pivoting to alternate industries in case of loss of livelihood, given their level of skills, they still had certain apprehensions in terms of transferring their skill set to alternate sectors. Among all workers, **45% believed that they did not have the requisite skills to work in their alternate sector of choice and 94% workers reported never having participated in any training program.** However, a majority of **85% workers expressed their willingness to get engaged in skilling or reskilling training programs to pivot to alternate livelihood opportunities.**

In terms of **alternate industries in the state that workers could transition to,** the potential for the renewable energy sector was also explored. However, it was noted that this sector would be **unable to absorb a large number of displaced coal workers** in the future.

While government **stakeholders and policymakers were optimistic about the potential and future of renewable energy in Jharkhand,** at its present state, the transition from coal to renewable energy will be gradual. **Only 24% workers** (engaged in any training program that provides alternate skills for employment outside of the coal sector) **were involved in attending trainings in the renewable energy sector.**

Findings also indicated that workers are likely to have a lower adaptive capacity due to a lack of skilling. It is thus, **imperative to explore alternate skilling programs and employment opportunities for coal sector workers, before a coal phase-down.** 'Just' transition initiatives around alternate skilling have to be **targeted towards 18 to 45 years old coal sector workers – who form 72.2% of the workforce** interviewed in this research.

While there are a few possible sectors that coal sector workers would be able to transition to, in the state of Jharkhand, they bring with them their own set of challenges which must be explored to truly gauge whether they form a viable employment option for coal sector workers or not.

- ▶ Coal sector workers depicted their willingness to **work in agriculture and allied sectors,** in case of loss of current livelihood source, with **32% workers** favouring it as their first choice; followed by **30% workers choosing the manufacturing sector** as their second choice and **27% opting for mining of other minerals** as their third choice.
- ▶ **82% coal sector workers also preferred migrating within Jharkhand,** in search of alternate livelihood opportunities. The possibility of sudden high levels of intra-state migration would cause upheaval and displacement of workers and micro-economies within the state of Jharkhand.

Several mine closures are already taking place internationally, and **as a precursor to a large-scale coal-phase down in India, mines are also getting closed down in small pockets around the country, including Jharkhand.** 'Energy transition cases from other countries like South Africa, Indonesia, the United States of America, Germany, Poland, Canada, and Ukraine provide best practices on how communities and economies pivoted or plan to pivot from coal, such as carbon tax, North-South cooperation, and financing for transition to sustainable energy sources, as well as actively including workers in the policy and decision-making towards phasing out coal, including measures like mining social packages for coal workers providing financial support for early retirement.

In India, one such case is in the **district of Giridih in Jharkhand, where one mine has been closed and another's operations have been temporarily halted pending an Environmental Clearance.** A case study of this district gives an **example of the impact that workers and communities in such areas experience after mines close.**

- ▶ Most workers employed by (CCL) in the closed mine were either relocated to a different coal mine in the neighbouring district of Bokaro or were retained for upkeep and maintenance of the closed mine.
- ▶ Interactions with the local community confirmed that daily wage workers suffered the largest financial loss in their income and savings with the closure of the coal mine.
- ▶ CCL personnel also indicated that while their organisation makes alternate arrangements for its employees in case of a mine closure, often by transferring them to another nearby mine; indirect workers (like truck drivers transporting coal) find alternate sources of employment themselves.



- ▶ To establish new industries and facilitate the availability of employment in non-coal industries within the district, the state government is taking steps toward diversifying its energy sector. As per recent developments in 2022, Giridih has been named a 'Solar City' to encourage investments in the solar energy sector.

For India to smoothly transition from coal as per its policy directives, planning needs to take place both in the short-term and in the long-term; as challenges will be faced across policy, sectoral, and individual levels.

The short-term scenario takes into account the period till the year 2030 when coal consumption and production are expected to peak. In the short-term, challenges mapped at the individual, sectoral, and policy levels had frequent overlaps. The challenges and their respective recommendations are given as follows.

Challenge	Recommendation
Increasing livelihood dependency on the coal sector in the short term due to the high demand for coal	<p><b>State-level policymakers:</b> Mapping skill sets of coal sector workers with existing industries in the state that have the potential to grow</p> <p><b>National-level policymakers:</b></p> <ul style="list-style-type: none"> <li>▶ Taking cognizance of the impact on unorganised workers and the local community arising from mine closures, the 'Guidelines for the Management of Mines discontinued/ abandoned/ closed before the year 2009' should be updated. Further, the guidelines may consider employment generation when planning the repurposing of land in and around closed mines.</li> <li>▶ Piloting the revised guidelines with coal companies that are in the process of closing mines to test its effectiveness.</li> </ul>
Lack of awareness on coal mine closure timelines and government plans at the state level and among coal industry workers	<p><b>State-level policymakers:</b></p> <ul style="list-style-type: none"> <li>▶ Commission district-level reports on the current status of the region's economy (like the type of jobs, social spending, etc.), to plan for an energy transition in coal-dependent economics</li> <li>▶ Identify sunrise sectors to catalyse investment in them, especially in areas where mines already exist</li> <li>▶ Establish a state-level joint committee as a backbone organisation to enable stakeholder representation in the coal ecosystem to facilitate and convene on activities specific to the state</li> <li>▶ Facilitate open forums and seminars to explain coal phase-down activities and tentative timelines and assuage workers' concerns regarding jobs and loss of livelihood</li> </ul>
Closing of small and underground mines in the short term	<p><b>State-level policymakers:</b> The Government may make it mandatory, through orders, for private companies to inform the government which mines they plan on shutting at least a year in advance so that timely action can be taken to rehabilitate displaced workers</p> <p><b>Coal Industry (PSUs):</b></p> <ul style="list-style-type: none"> <li>▶ Provide severance pay and benefits to workers that will be losing their jobs</li> <li>▶ Relocate employees to new mines that they will be opening while ensuring travel and relocation allowances for the same</li> </ul> <p><b>Coal Industry (Private):</b> Private companies operating coal mines should adhere to government guidelines and as mandated by the government; they should share their yearly mine closure plans with the government at least a year in advance so that timely action can be taken to rehabilitate displaced workers</p> <p><b>Individuals/Coal Sector Workers:</b> Participate in training, skill development, and education programs of the government</p>

Challenge	Recommendation
Substantial dependency of sectoral players on the central government	<p><b>National-level Policymakers:</b> Updating 'Guidelines for Preparation of Final Mine Closure Plan' to include suggestive plans to accommodate workers affected by mine closure through steps such as providing temporary income support, providing training to displaced workers, connecting workers to potential employers</p> <p><b>State-level Policymakers:</b> Advocate for coal sector workers to relevant stakeholders in the Central Government in terms of energy transition preparation and preparing for an alternate livelihoods plan</p> <p><b>Coal Industry (PSUs):</b> Support the state government in terms of skill set mapping at the district level and trainings for organised workers</p> <p><b>Coal Industry (Private):</b> Invest in sunrise sectors identified by the state governments</p>
Lack of financing for energy transition and alternate livelihoods	<p><b>National-level Policymakers:</b></p> <ul style="list-style-type: none"> <li>Enabling the inclusion of net-zero and energy transition goals in the central bank's mandate for percolation to the rest of the financial sector</li> <li>Establishing a cess for energy transition activities</li> </ul> <p><b>State-level Policymakers:</b> Quantifying the level of investment needed for energy transition and identifying the sources of funding for the same</p> <p><b>Financial sector:</b> Private and public banks may look at further aligning their portfolio to address climate change, including energy transition to encourage the private sector and corporations to invest in related projects</p>

Since a large-scale coal phase-down is going to take place only in the long term, the short-term presents itself as a unique period where key influencing stakeholders can observe the current coal ecosystem and plan for the long-term scenario, without getting complacent.

The long-term scenario encompasses predicting a decline in coal consumption and production trends, after 2030. For the long term, challenges and recommendations adopted a top-down approach since it was centred around large-scale mine closures. In the long-term, challenges, and recommendations are outlined at the policy, sectoral, and individual levels as given below.

Challenge	Recommendation
<p><b>Policy level:</b></p> <ul style="list-style-type: none"> <li>Loss of government revenue</li> <li>Government is the key influencing stakeholder</li> <li>Economic and forced migration</li> </ul>	<p><b>Policy level:</b></p> <ul style="list-style-type: none"> <li>Phase down should be smooth, planned, and well-managed, so that it does not cause a "shock" to the economy</li> <li>Developing and sustaining sunrise sectors for economic growth</li> <li>Financial support and incentives: soft loans, promote livelihood generation schemes, promote SHGs</li> <li>Immediate social security and support</li> <li>Promoting schemes for housing and resettlement</li> </ul>



Challenge	Recommendation
<b>Sectoral level:</b> <ul style="list-style-type: none"> <li>▶ Lack of opportunities to absorb displaced workers</li> <li>▶ Loss of jobs in affiliated industries</li> <li>▶ Lack of safety net for non-contractual workers</li> </ul>	<b>Sectoral level</b> <ul style="list-style-type: none"> <li>▶ Compensation: advance imitiation of mine closure, clearance of dues, early retirement, severance benefits, skill-based training, social security</li> <li>▶ Diversification of businesses</li> <li>▶ Rehabilitation of the environment and repurposing mines for economic activity</li> </ul>
<b>Individual level:</b> Lack of financial security, low levels of skilling, and resistance to behaviour change	<b>Individual level:</b> Continue to participate in skilling programs and opportunities - created by government and private sector companies

This top-down approach highlights that **planning and interventions at the policy level are likely to be the guiding force** based on which sectoral and individual level stakeholders will respond to a shift from the coal industry.

In both scenarios, **individual-level stakeholders - the coal sector workers in Jharkhand, whether direct or indirect employees, will encounter challenges due to a slowdown in the coal economy.** These stakeholders will largely be at the receiving end of policy-level and sectoral-level measures and interventions for an energy transition. **The absence of a clear timeline for the phaseout of coal, coupled with conflicting signals on the use of coal,** will pose a challenge for states to plan a multi-decadal transition process. It is recommended that, in the year of G20, **India should outline clear timelines for the energy transition, including the financing support it would need to enable this transition.**



# 1

## Introduction





# 1 Introduction to the research

## 1.1 Background and objectives

India has set forth a target for achieving a net zero by 2070, at the COP26 conference while emphasizing a “coal phase down” approach as opposed to a “coal phase-out” approach. The Paris agreement presented 2050 as a target year for countries to proactively transition out of fossil fuel dependency. However, **India, taking cognizance of its current development and industrial requirements, has committed to the world to achieve a net zero target by 2070** instead of 2050. During COP27, held in November 2022, India released a national report focused on the country's long-term low-emission development strategy to the United Nations Framework Convention on Climate Change (UNFCCC). The key focus area in the report was **transitioning from fossil fuels in a just, smooth, sustainable, and all-inclusive manner**. In addition, the country also updated its Nationally Determined Contributions (NDCs) in August 2022 (before COP27) that it aims to achieve by 2030 (these are elaborated in further sections)<sup>11</sup>:

- ▶ Put forward and further propagate a healthy and sustainable way of living based on traditions and values of conservation and moderation, including through a mass movement for ‘LIFE’- ‘Lifestyle for Environment’ as a key to combating climate change
- ▶ Meet 50% cumulative electric power installed capacity from non-fossil fuel-based energy resources
- ▶ Create an additional carbon sink of 2.5 to 3 billion tons of CO<sub>2</sub> equivalent
- ▶ Reduce emissions intensity of its GDP by 45% from the 2005 level

India's commitments at COP27 and in the revised NDCs highlight the country's commitment towards transitioning from fossil fuels like coal, in a just manner.

Along with its commitment to global normative frameworks, India has brought various domestic policy measures that align with its goal of phasing coal down, key among these are as follows:

- ▶ The draft **National Electricity Plan for 2022-27**, through which the Government expects domestic coal requirement to touch 1018.2 MT by 2031-32.<sup>12</sup>
- ▶ According to the Plan, the Government intends to **retire coal-based capacity totalling 4,629 MW between 2022 and 2027**.
- ▶ The Plan also indicated **retiring old and inefficient power plant units that cannot undergo renovation and modernization** to reduce carbon emissions.
- ▶ The **Green Energy Open Access Rules** were released in 2022 to make it easier for consumers to access green power by promoting the generation, purchase, and consumption of green energy.<sup>13</sup>
- ▶ As per a notification released by the Government on 6 March 2023, **India has introduced a "Renewable Generation Obligation (RGO)"** that requires all new coal-based power plants to obtain 40% of their capacity from renewable energy sources.

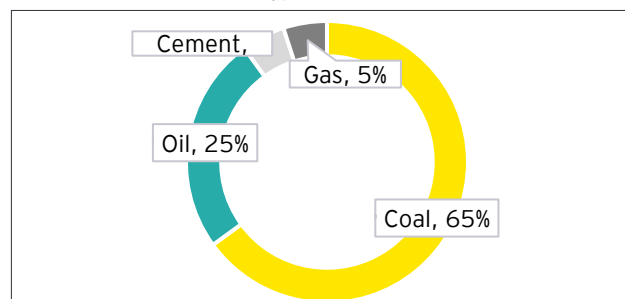
Despite the policy measures and India's emphasis on the adoption of renewable energy sources, **the Central Electricity Authority (CEA) of India recently instructed power utilities not to decommission any thermal units until 2030**. The **lack of clarity in policy measures and misalignment in the policy and actions** goes to impact the country's net zero commitments; subsequently acting as a challenge for states to plan for a 'just' transition.

The coal sector is a key driver of the Indian economy and the country accounted for 7% of all carbon emissions in the world in 2020. In 2020, the country produced 2.44 billion tons (BT) of CO<sub>2</sub> emissions, of which 1.59 BT or 65% was from coal.

Figure 1 depicts the breakdown of India's annual CO<sub>2</sub> emissions in 2020 by source: either coal, oil, gas, cement production, or gas flaring. 0.6 BT of CO<sub>2</sub> emissions was from oil, followed by 0.12 BT emissions from cement and gas, each.<sup>14</sup>

On the other hand, of all sectors, the power or energy sector in India is also the highest emitter of carbon emissions since, as of February 2023, 57.4% of all installed power generation capacity is from fossil fuels, of which, coal makes up 49.7%.<sup>15</sup>

Figure 1: India's CO<sub>2</sub> emissions in 2020, categorised by type of fuels



Source: [India - CO<sub>2</sub> Country Profile \(2020\)](#)

<sup>11</sup> <https://unfccc.int/sites/default/files/NDC/2022-08/India%20Updated%20First%20Nationally%20Determined%20Contrib.pdf>

<sup>12</sup> [https://cea.nic.in/wp-content/uploads/irp/2022/09/DRAFT\\_NATIONAL\\_ELECTRICITY\\_PLAN\\_9\\_SEP\\_2022\\_2-1.pdf](https://cea.nic.in/wp-content/uploads/irp/2022/09/DRAFT_NATIONAL_ELECTRICITY_PLAN_9_SEP_2022_2-1.pdf)

<sup>13</sup> [https://greenopenaccess.in/assets/files/Green%20Energy%20Open%20Access\\_rules.pdf](https://greenopenaccess.in/assets/files/Green%20Energy%20Open%20Access_rules.pdf)

<sup>14</sup> <https://ourworldindata.org/co2/country/india?country=~IND>

<sup>15</sup> <https://powermin.gov.in/en/content/power-sector-glance-all-india>

Taking these two points into consideration for reaching net zero, **tackling the coal sector in India is of utmost importance**. At the same time, for a developing country like India, phasing down coal would mean developing alternate, efficient, and cost-effective resources that will help meet its energy requirements which are only growing with industrial growth and economic development.

The implications of this phase-down of coal will be higher for the states with the highest number of mines and coal production. As on March 2021, **Jharkhand has the highest number of coal mines in the country**, standing at 113 mines that accounting for 26% of all coal mines in the country.<sup>16</sup> Collectively, they produced over 115 million tons (MT) of coal in 2020-21, only after Chhattisgarh, Odisha, and Madhya Pradesh.<sup>17</sup> The specific conditions of the coal sector in Jharkhand merit a deeper understanding of the ways in which the state can achieve net zero in the coal sector, while at the same time ensuring that the transition is fair and equitable to those whose livelihoods depend on it.

*In this regard, a research study was undertaken, for understanding the implications of a 'just' transition in Jharkhand, with a focus on alternate livelihoods for coal sector workers. The study aims to capture the perception around the 'just' transition from a supply, demand, and policy perspective, and provide recommendations that will lead to inclusive and sustainable growth for workers working in the coal sector.*

Some of the **indicative areas of inquiry** that this research aimed to answer, across the three levels are enlisted below.

#### Individual level

- ▶ Demographic and employment details of coal sector workers including organised coal workers, unorganised coal workers, and thermal power plant workers
- ▶ Challenges faced by workers in coal mines and thermal power plants
- ▶ Perception on the future of coal mines and thermal power plants, especially in terms of awareness of coal mines and thermal power plants closing and the reasons for the same
- ▶ Skill levels of coal sector workers in terms of alternate sectors they can transition to with a coal phase-down
- ▶ Awareness of and participation in government skill development programs
- ▶ Adaptive capacity and financial sustainability of coal sector workers given a coal phase-down
- ▶ Livelihood support envisaged from employers given a coal phase-down
- ▶ Livelihood support envisaged by the government given a coal phase-down

#### Sectoral level

- ▶ State of coal mining and power generation, especially in terms of:
  - ▶ Supply and demand side challenges in the coal mining and power generation sectors
  - ▶ Major industries to which coal is supplied within and outside Jharkhand
- ▶ Level of dependency of coal sector workers on the coal mining and thermal power plant industries
- ▶ Type of workforce across different job roles, employment nature, and gender at coal mines and thermal power plants
- ▶ Skill levels of coal sector workers, as perceived by employers, at coal mines and thermal power plants
- ▶ Industry plans to invest in renewable energy in the state
- ▶ Recommendations for improving coal mining and power generation in the state, with a focus on 'Just' Transition

#### Policy level

- ▶ Central and state government plans for coal phase-phase down in India and Jharkhand, respectively
- ▶ Alternate industries and employment opportunities in and around coal mining and power generation districts
- ▶ Need for behavioral change among coal sector workers, given a coal phase-down
- ▶ Possibility of migration among coal sector workers given a coal phase-down
- ▶ Scope for using renewable energy for power generation and potential renewable energy investments in Jharkhand
- ▶ Skill set needed among a renewable energy workforce and potential transferability of skills between the coal and the renewable energy sector
- ▶ Recommendations for improving coal mining and power generation, with a focus on 'Just' Transition
- ▶ Effective strategies for addressing net zero commitments across coal mining and power generation industries

<sup>16</sup> <http://www.coalcontroller.gov.in/writereaddata/files/download/coaldirectory/CoalDirectory2020-21.pdf>

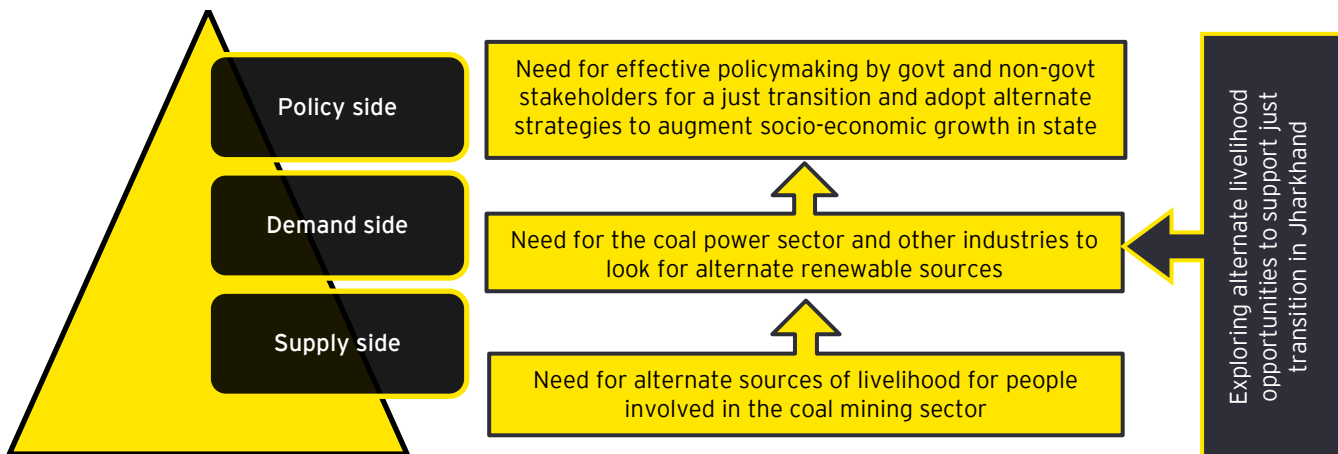
<sup>17</sup> <http://www.coalcontroller.gov.in/writereaddata/files/download/coaldirectory/CoalDirectory2020-21.pdf>



## 1.2 Approach

A **bottom-up approach** has been utilized for this research, wherein the **views of stakeholders from the supply, demand as well as policy sides were taken into consideration** - with regard to the sub-outcomes of each stakeholder group and the overall outcome for the state. While the supply side included stakeholders from the coal mining sector, the demand side included stakeholders from the coal power sector and other industries. The policy side encompassed government and non-government stakeholders involved in relevant policymaking and expertise at the state and national levels.

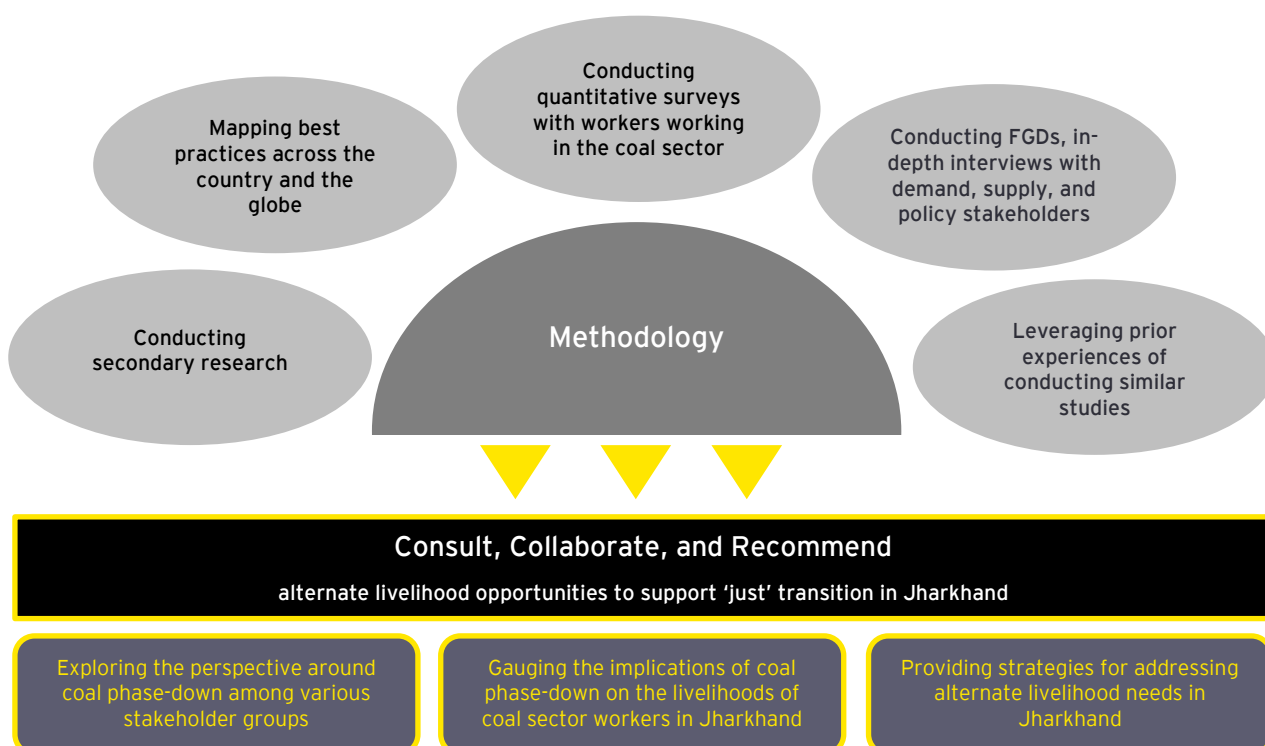
This study also utilized a human-centric design approach to synthesize available data and information and provide recommendations on a policy, sectoral, and individual level. The human-centric design approach was applied in the context of a Just Transition in Jharkhand and maintains the primary stakeholders - coal sector workers - at the centre of all research, analysis, and recommendations provided in this report.



## 1.3 Methodology

The methodology for this research encompassed drawing insights from **various research components - secondary research, best practices research, and primary research (quantitative and qualitative)**. Figure 2 portrays the research methodology which has been detailed subsequently.

Figure 2: Diagrammatic representation of methodology adopted for conducting this research



### Secondary research:

- ▶ Secondary research involved conducting an as-is review of the coal mining and coal power sector, with a focus on Jharkhand. Past and current literature around the coal sector and 'Just' Transition in India and Jharkhand were reviewed, including - government data on coal consumption and production, government vision documents, studies on coal sector workers, coal economy, strategy documents on Just Transition, current developments in the policy landscape and others.
- ▶ **Best practices research** encompassed reviewing and identifying just transition plans and best practices being followed around net zero across the globe.

### Primary research:

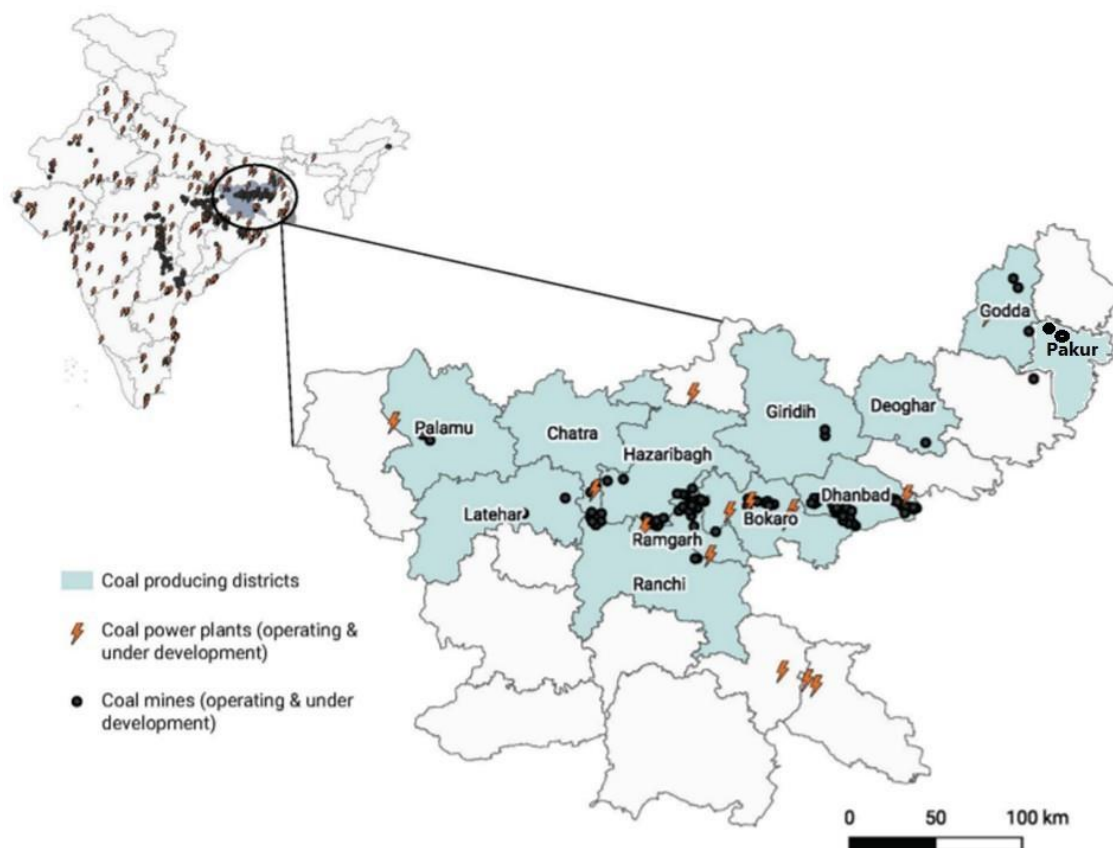
As a part of the primary research, quantitative surveys along with qualitative in-depth interviews (IDIs) and Focus Group Discussions (FGDs) were conducted with stakeholders at various levels.

**Geography for the primary research** was selected as per the concentration of coal mines and coal power plants in various districts of Jharkhand. The coal mines and power plants are concentrated in the central and eastern parts of the state (as indicated in Figure 3). Of the 24 total districts in Jharkhand, coal mines and coal power plants are present in 15 districts. Considering districts as the primary sampling unit (PSU) for this research, **5 districts were purposively selected** basis the following selection criteria:

- ▶ Districts **home to both, coal mines as well as coal power plants** - thus, ensuring a higher probability of reaching the target audience of workers working in the demand and supply side of the coal sector
- ▶ Districts having a **high concentration of coal production units** (mines and power plants) - thus, having **higher economic contribution** as compared to the other districts
- ▶ Districts with a **relatively higher population density of workers** working within the organised space (mines and power plants) and unorganised space of the coal sector.

Keeping the selection criteria in mind, adjoining districts were proposed to be selected to optimise travel time. **The 5 districts that were selected were - Ramgarh, Ranchi, Bokaro, Dhanbad, and Chatra.**

Figure 3: Concentration of coal mines and thermal power plants in Jharkhand



Source: [Understanding just transitions in coal-dependent communities by CSIS & CIF under the Just Transition Initiative \(October 2021\)](#)



## 1.4 Sample distribution and coverage

### 1.4.1 Coal sector workers

**Quantitative surveys** were administered with workers at ground level, working in the organised and unorganised space of the coal sector, and were bifurcated into three categories:

- ▶ Workers working in the organised coal mining sector (supply)
- ▶ Workers working in the organised coal power plants (demand)
- ▶ Workers working in the unorganised coal sector

Using the below formula, the **sample size for each target group per district** was estimated to be 384, which was rounded off to **400** at a non-response rate of 5%.

$$n = \frac{t^2 \times p(1-p)}{m^2} \times NRR$$

Where,

**n** = estimated sample size

**t** = Z value (1.96 for 95% confidence level)

**p** = percentage picking a choice (0.5 assumed for the proportion of workers being part of a just transition, from the

- ▶ organised coal mining sector (supply)
- ▶ organised coal power plants (demand)
- ▶ unorganised coal sector

**m**= marginal standard error (assumed as 0.05)

**NRR**= Non-response rate (assumed as 5%)

The sample of **6,000 interviews across five districts** was achieved among the workers across three categories.

**Qualitative interactions**, involving **Focus Group Discussions (FGDs)** and **In-Depth Interviews (IDIs)** were conducted with different stakeholder groups.

**Focus Group Discussions** were conducted with the workers in the organised as well as unorganised sectors in the coal mining sector as well as coal power plants. A total of **20 FGDs** were conducted to get their perspective on the importance of coal for their livelihoods, their existing skills level, and what can be the potential livelihood opportunities outside the coal mining and coal power sector.

The sample coverage of both quantitative and qualitative interactions with coal sector workers has been given in the table below:

Target Group	Ranchi		Dhanbad		Ramgarh		Chatra		Bokaro	
	Survey	FDGs	Survey	FDGs	Survey	FDGs	Survey	FDGs	Survey	FDGs
Supply-side workers (mines)	400	1	400	1	400	1	400	2	400	2
Workers in un-organised space	400	1	400	1	400	2	400	-	400	1
Demand side workers (Thermal Power Plants)	-	2	400	2	500	1	500	2	600	1
<b>Total per district</b>	<b>800</b>	<b>4</b>	<b>1200</b>	<b>4</b>	<b>1300</b>	<b>4</b>	<b>1300</b>	<b>4</b>	<b>1400</b>	<b>4</b>

### 1.4.2 Supply, demand, and policy-side stakeholders

Additionally, **in-depth interviews** were conducted with stakeholders from the demand, supply as well as policy sides. Insights from the qualitative data helped in getting a deeper understanding of the current state of affairs and guide the way in terms of weighing the pros and cons of different solutions and recommending alternate livelihood opportunities for coal sector workers.

**26 in-depth interviews were conducted with stakeholders** across various groups, involving the central government, the state government, think tanks, contracting organisations, coal sector organisations, trade unions, and others. In addition to 18 discussions conducted with the stakeholders at the national and state level (across the five study districts), interactions were also conducted with eight stakeholders from Giridih, an additional district in the study geography, wherein two mines had halted their operations in the past few years.

Stakeholder group	S. No.	Organisation
<i>Government officials</i>	1	Ministry of Coal, Government of India
	2	Jharkhand State Livelihood Promotion Society, Government of Jharkhand
	3	Department of Labour, Employment, Training, and Skill Development, Government of Jharkhand
	4	Department of Labour, Employment, Training, and Skill Development, Government of Jharkhand
	5	Labour Commissionerate, Government of Jharkhand
	6	Department of Mines and Geology at the state level, Government of Jharkhand
	7	Jharkhand Renewable Energy Development Agency, Government of Jharkhand
<i>Coal sector organisations</i>	8	Coal India Limited, Jharkhand
	9	Central Coalfields Limited, Bokaro, Jharkhand
	10	Coal Mine Planning and Development Institute, Jharkhand
	11	Damodar Valley Corporation (DVC), Jharkhand
<i>Think tanks</i>	12	NITI Aayog
	13	Shakti Sustainable Energy Foundation, New Delhi
	14	Observer Research Foundation, New Delhi
	15	Central Institute of Mining and Fuel Research (CIMFR), Jharkhand
	16	Centre for Environment and Energy Development, Jharkhand
<i>Contracting organisations, trade unions, and workers</i>	17	Coctecna Bokaro (The company assists mines and thermal power plants in identifying contractual employees)
	18	Centre of Indian Trade Unions, Jharkhand

#### ***Stakeholder interactions in Giridih, Jharkhand***

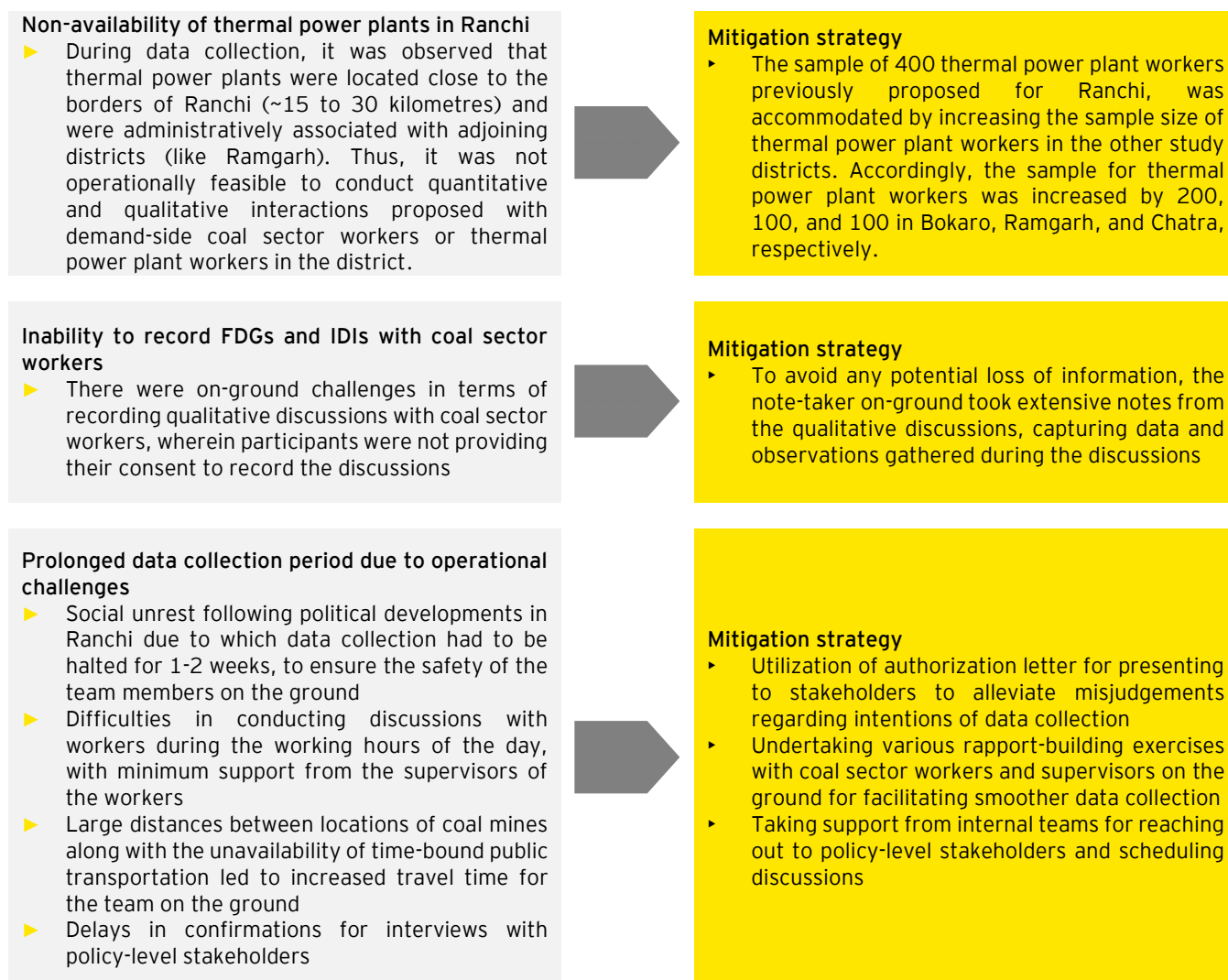
As mentioned above, in addition to the five designated study districts, visits were also conducted in a sixth district - Giridih. Since two mines in the district had halted their operations in the past few years, Giridih was identified as a relevant geography to capture district and sub-district level views of stakeholders in areas that present lived experiences around alternate livelihood scenarios. Interactions were undertaken with eight stakeholders in Giridih to help develop a case study for understanding the implications of such temporary mine closures on workers, especially from a livelihood perspective.

Stakeholder group	S. No.	Organisation
<i>Government officials</i>	1	Department of Mines and Geology, Giridih, Government of Jharkhand
	2	District Administration, Giridih, Government of Jharkhand
	3	Block Administration, Giridih, Government of Jharkhand
<i>Coal sector organisations</i>	4	Kabribad Open Cast Project, Central Coalfields Limited, Giridih, Jharkhand (Project Officer)
	5	Kabribad Open Cast Project, Central Coalfields Limited, Giridih, Jharkhand (Environment Officer)
	6	Giridih Open Cast Project, Central Coalfields Limited, Giridih, Jharkhand
<i>Contracting organisations, trade unions, and workers</i>	7	Giridih Open Cast Project, Central Coalfields Limited, Giridih, Jharkhand (Former organised coal sector worker)
	8	Giridih Open Cast Project, Central Coalfields Limited, Giridih, Jharkhand (Former unorganised coal sector worker)



## 1.5 Limitations of the research

The limitations encountered in this research have been mapped along with the strategies used for minimizing or overcoming the same and presented below.



# 2

## Overview: Understanding 'Just' Transition





## 2 Overview: Understanding 'Just' Transition

### 2.1 India's Net Zero commitments

India has set a target for achieving net zero by 2070, along with other climate-related commitments. This section details the updated Nationally Determined Contributions (NDCs)<sup>18</sup> made by India before the COP27 conference, which it aims to achieve by 2030.<sup>19</sup>

Put forward and further propagate a **healthy and sustainable way of living based on traditions and values of conservation and moderation**, including through a **mass movement for 'LIFE'- 'Lifestyle for Environment'** as a key to combating climate change

Its three key phases are:

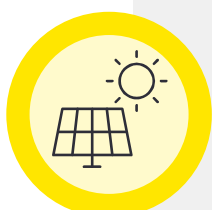
- ▶ To promote globally the practice of simple yet effective environment-friendly actions by individuals in their daily lives
- ▶ Consequent response by industry and markets, tailoring supply and procurement, following from large-scale transformation of individual demand
- ▶ Through changes in demand and supply dynamics globally to promote long-term shifts in industrial and Government policies that can support sustainable consumption and production

As more and more individuals become a part of this movement, LIFE has the potential to positively impact consumption patterns from the ground up to reduce dependence on fossil fuels like coal.



**Meet 50% cumulative electric power installed capacity from non-fossil fuel-based energy resources**

- ▶ The updated commitment also calls for facilitating the same with the help of the transfer of technology and low-cost international finance including from the Green Climate Fund.
- ▶ According to the Central Electricity Authority, India currently meets about 20% of its electrical energy requirement from renewable energy. The country's electrical energy requirement is expected to grow about one and a half times in this decade - from 1566 billion units in 2021-22 to 2325 billion units (or terawatt-hours) in 2029-30.
- ▶ While the market factors and falling prices of renewable energy (solar, wind, and hydropower) play an important role, the country would also require carbon-free electricity standards and significant investments to store and transmit renewable electricity to achieve this target of sourcing 50% of energy from renewables.



**Create an additional carbon sink of 2.5 to 3 billion tons of CO2 equivalent**

- ▶ The commitment also highlights that it aims to do so through additional forest and tree cover.
- ▶ In 2016, India's total greenhouse gas emissions were 2.8 billion tons (excluding land use and forestry). The Energy Policy Simulator for India estimates that India's emissions could grow from 3.3 billion tons in 2021 to reach 4.6 billion tons in 2030 (excluding land use and forestry) based on current policy and actions in renewable energy, energy efficiency, and electric mobility, and cost-optimization of technologies in the electricity and transport sectors.



<sup>18</sup> <https://unfccc.int/sites/default/files/NDC/2022-08/India%20Updated%20First%20Nationally%20Determined%20Contrib.pdf>

<sup>19</sup> <https://wri-india.org/blog/cop26-unpacking-india%E2%80%99s-major-new-climate-targets>



#### Reduce emissions intensity of its GDP by 45% from the 2005 level

- ▶ According to India's third Biennial Update Report, by 2016, the emissions intensity of GDP had fallen by 24%, compared to 2005. The emissions intensity of the Indian economy has been steadily declining due to more renewable energy, improved energy efficiency, and structural shifts towards the services sector.

At COP27, specifically with respect to coal, India's focus remained on undertaking a low-carbon development, rather than a phase-out of coal. With respect to the same, it released a national report focused on its long-term low-emission development strategy to the United Nations Framework Convention on Climate Change (UNFCCC)<sup>20</sup>. As part of it, some of the key areas that it plans on focusing on are:

1. Rational utilization of national resources with regard to energy security. Transitions from fossil fuels will be undertaken in a just, smooth, sustainable, and all-inclusive manner.
2. India's industrial sector will continue to grow based on the "Make in India" platform; the focus will be on improving energy efficiency within this sector.
3. Advocated for the provision of climate finance by developed countries to secure the transition to a low-carbon development pathway.
4. Increased use of biofuels in terms of ethanol with petrol, increasing electric vehicle usage, etc. India aims to maximize the use of electric vehicles and ethanol blending to reach 20% by 2025, along with a strong shift to public transport.
5. Smart city initiatives will be focused on, in terms of urbanization.

In addition to the low emission development strategy, the Central Government is also considering the adoption of emissions reduction technologies like carbon capture utilization sequestration (CCUS), specifically in the power sector.<sup>21</sup> Such technologies imply that they will delay a necessary coal phase-down.

While the commitments made by India in the run-up to, and at COP27 are expected to have many benefits for the country in the long run, **they also indicate that coal continues to be a crucial part of the Indian economy, especially for energy security.**

In terms of financing both the NDCs and the strategy, a key aspect that India stresses upon is the mobilization of new and additional funds from developed countries, along with domestic funding. Given this, it is evident that India expects climate finance to be driven by developed nations, which includes financing a just energy transition from coal.

However, the key outputs of COP27 as highlighted in the Sharm el-Sheikh Implementation Plan are loosely aligned with India's needs.<sup>22</sup> Specifically, though India has called for a phase-down of all fossil fuels, the implementation plan only calls for efforts towards the phasedown of unabated coal power, even though India has stressed on the importance of its energy security.

<sup>20</sup> [https://unfccc.int/sites/default/files/resource/India\\_LTLEDS.pdf](https://unfccc.int/sites/default/files/resource/India_LTLEDS.pdf)

<sup>21</sup> Carbon Capture, Utilization and Storage (CCUS): Policy Framework and its Deployment Mechanism in India, NITI Aayog, November 2022

<sup>22</sup> [https://unfccc.int/sites/default/files/resource/cop27\\_auv\\_2\\_cover%20decision.pdf](https://unfccc.int/sites/default/files/resource/cop27_auv_2_cover%20decision.pdf)



## 2.2 Coal mining in India

### 2.2.1 Coal consumption trends

Majority of the coal mined in India is produced mainly from open-cast mines. India currently produces about 77% of its overall coal from open-cast mines<sup>23</sup>. It is currently estimated that India has 326.5 billion tons (BT) of coal resources wherein, 47.6% (nearly 155.6 BT) are proven resources<sup>24</sup>. According to the 2020 International Energy Agency (IEA) report, **the consumption of coal in India is likely to peak between 2030 and 2035**, and it is only after this peak will the demand and supply of coal begin falling. **There exists a general sense of uncertainty amongst stakeholders regarding the future of the coal sector.** The in-depth interviews showcased that many stakeholders were of the opinion that the demand for coal is not going to decrease, rather there will be a sharp increase in the demand and supply of coal within the foreseeable future. The stakeholders indicated that the coal sector is not diminishing and will flourish further due to high demand and supply. They were, however, unsure of when it will reach its eventual peak. This peak may become harder to estimate if the Central Government gives a strong policy push towards carbon sequestration technologies.



*Coal is going to be more ecologically sound and efficient in the future. The Ministry's focus is on 2070 long-term commitments and plans to ensure that coal production is environmentally sustainable. To this end, the Ministry is also looking at adopting various interventions for carbon sequestration.*

Official in Government of India



There is strong evidence to support the idea that **there is going to be a steep upward incline in coal consumption in India**. This included a rising increase in demand and supply of coal that can not only be attributed to the power and electricity sector, but also to other manufacturing sectors such as steel, cement, and brick<sup>25</sup>, where coal is crucial. Due to the critical role that coal plays in other key industries in India, it is crucial to understand the ripple effects that an eventual coal phase-down would have on a wider scale. Furthermore, exploration of the multi-pronged linkages of coal within the Indian formal and informal economy is crucial to gauge the impact of any changes within the coal industry.

**The Ministry of Coal has made it abundantly clear that one of its key policy goals is to ensure transparent and competitive coal markets in India**<sup>26</sup>. This objective will be the foundation upon which the coal consumption trends for the foreseeable future will be based. The Ministry of Coal aims to work towards this key policy area by spearheading an online platform for coal trading and transactions, eventually establishing a domestic coal price index<sup>27</sup>. Furthermore, the trends of coal mining in India are expected to change based on the recommendations of the Government. These recommendations are focused on the transformation and mechanization of coal mining by encouraging coal mining companies to utilize small- and large-scale robotics fleets such as drones to improve mine monitoring and mapping, fire mapping, land reclamation, and monitoring of mine closures at critical mines<sup>28</sup>.

The Ministry of Coal of India also explained that the coal industry has transformed significantly in the past three to five years. The industry went from importing excessive amounts of coal due to a coal deficit, to achieving a majority of the country's coal demand<sup>29</sup>. Despite this substantial growth, however, there has been a consistent decline in formal employment in recent years which has been attributed to an increase in mechanization. Data from the reports explains that between the years 2000-2014, the labour productivity of the coal sector increased by about 6.6% per year thus also increasing output by 4.9% per year. However, it was noted that during this period, employment fell by about 1.8% per year<sup>30</sup>. **This steady decline in formal employment poses a threat to the delicately balanced coal industry ecosystem within the individual districts and states that are heavily dependent on coal, such as Jharkhand.**

Currently, the coal mining ecosystem is headed by a few stakeholders such as Coal India Limited along with others that are primarily managed by the central government of India. This organisation works through subsidiaries in 80+ mining areas that

<sup>23</sup> <https://www.nfi.org.in/sites/default/files/publication/cti.pdf>

<sup>24</sup> [https://iforest.global/wp-content/uploads/2021/04/iFOREST\\_Just\\_Transition\\_In\\_India.pdf](https://iforest.global/wp-content/uploads/2021/04/iFOREST_Just_Transition_In_India.pdf)

<sup>25</sup> [https://justtransitioninitiative.org/wp-content/uploads/2021/10/CoalDependentCommunities\\_Report.pdf](https://justtransitioninitiative.org/wp-content/uploads/2021/10/CoalDependentCommunities_Report.pdf)

<sup>26</sup> [https://coal.gov.in/sites/default/files/2021-01/vision\\_document.pdf](https://coal.gov.in/sites/default/files/2021-01/vision_document.pdf)

<sup>27</sup> [https://coal.gov.in/sites/default/files/2021-01/vision\\_document.pdf](https://coal.gov.in/sites/default/files/2021-01/vision_document.pdf)

<sup>28</sup> [https://coal.gov.in/sites/default/files/2021-01/vision\\_document.pdf](https://coal.gov.in/sites/default/files/2021-01/vision_document.pdf)

<sup>29</sup> [https://coal.gov.in/sites/default/files/2021-01/vision\\_document.pdf](https://coal.gov.in/sites/default/files/2021-01/vision_document.pdf)

<sup>30</sup> [https://iforest.global/wp-content/uploads/2021/04/iFOREST\\_Just\\_Transition\\_In\\_India.pdf](https://iforest.global/wp-content/uploads/2021/04/iFOREST_Just_Transition_In_India.pdf)

are spread over seven states of India<sup>31</sup>. The mines in these areas are responsible for the generation of 7.25 lakh of direct employment along with an undisclosed number of indirect employment. The direct workers include those that work in the mines and washeries, executives in the coal company offices and support staff, and any other employee on the company's payroll<sup>32</sup>. The indirect workers include jobs such as trucking and other coal-induced jobs such as restaurant workers serving coal workers in the mining regions which cannot be quantified<sup>33</sup>.

**National Foundation for India (NFI) has estimated that there are more than 13 million people indirectly dependent on the coal sector in India, and a majority of them are concentrated in the highest coal-producing states such as Jharkhand.** Understanding the micro-ecosystem within the districts provides the necessary context to explore any impact that changes within the coal industry would have.

Source<sup>34</sup>

Through the macro lens, the coal industry's overall ecosystem is just as complicated as the individual district coal ecosystem. In a report that discusses the socio-economic impacts of coal transitions in India by the National Foundation for India, it is explained that both the central and state governments are involved in decisions relating to the coal sector. However, it is the broader and more general decision-making that concerns the central government, while the state government works on the planning and implementation of those decisions. It has been remarked that the current system causes an imbalance since most of the revenues reach the central rather than the state government. Since the coal sector impacts other sectors (railways, manufacturing, etc.) and creates a large portion of employment within the country, it is of utmost importance that a plan for a just transition is devised well in advance.<sup>35</sup>

## 2.2.2 Coal industry in Jharkhand

The coal industry in Jharkhand is heavily intertwined with the overall Indian coal economy, given that it is one of the largest coal-producing states in India.

As on March 2021, **Jharkhand has the highest number of coal mines in the country**, standing at 113 mines which generate more than 115 million tons (MT) of coal every year.

Source<sup>36</sup>

Presently, there are three of the eight subsidiary companies of Coal India Limited (CIL), Central Coalfields Limited (CCL), Bharat Coking Coal Limited (BCCL), and Central Mine Planning & Design Institute (CMPDI); which are headquartered in

<sup>31</sup> <https://ficci.in/spdocument/23589/studies.pdf>

<sup>32</sup> <https://ficci.in/spdocument/23589/studies.pdf>

<sup>33</sup> <https://ficci.in/spdocument/23589/studies.pdf>

<sup>34</sup> <https://www.nfi.org.in/sites/default/files/publication/cti.pdf>

<sup>35</sup> [https://iforest.global/wp-content/uploads/2021/04/iFOREST\\_Just\\_Transition\\_In\\_India.pdf](https://iforest.global/wp-content/uploads/2021/04/iFOREST_Just_Transition_In_India.pdf)

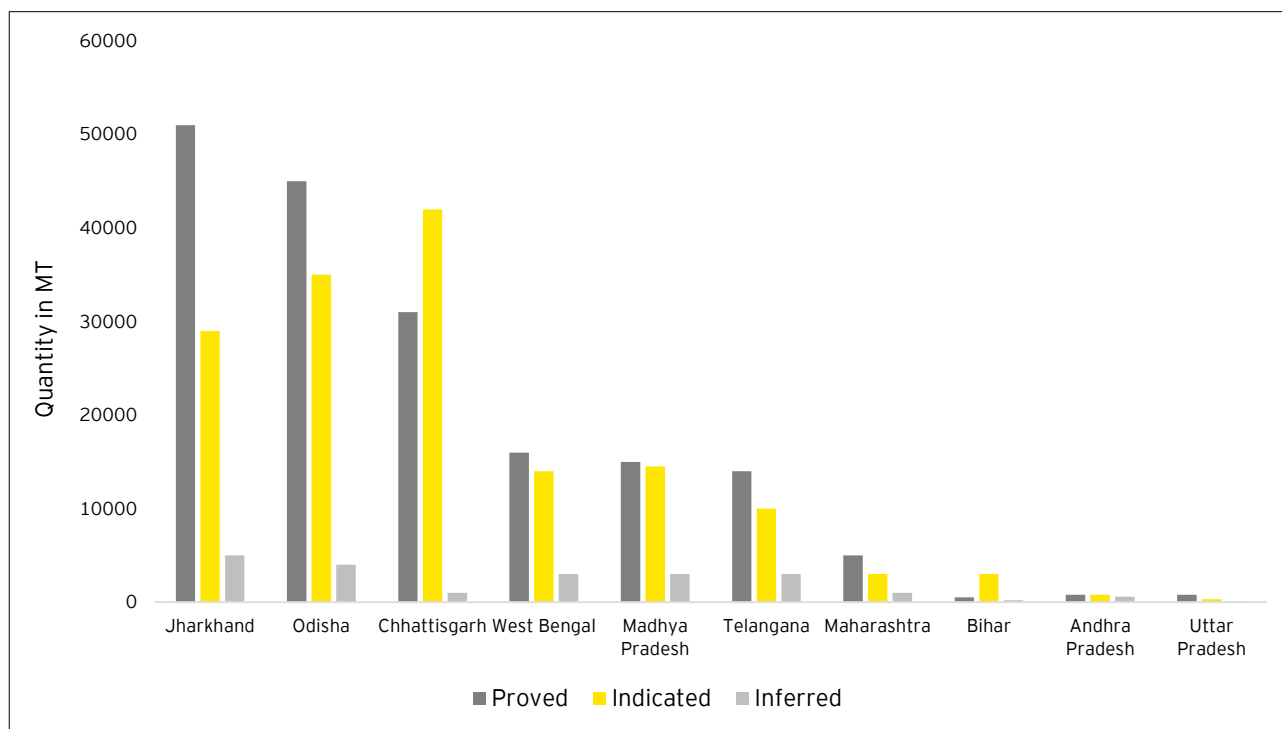
<sup>36</sup> <http://www.coalcontroller.gov.in/writereaddata/files/download/coaldirectory/CoalDirectory2020-21.pdf>



Jharkhand<sup>37</sup>. It has been observed that all eleven districts within the state that have coal mines and/ or thermal power plants, directly contribute to revenues to all levels of government. The coal mining industry is also a source of revenue generation for other sectors, such as the railways<sup>38</sup>.

Figure 4<sup>39</sup> demonstrates the claim that Jharkhand has the highest level of proved coal reserves and one of the highest levels of indicated coal reserves. The graph represents state wise inventory of geological resources of coal in Gondwana Coalfields, which makes up 98 percent of the total reserves and 99 percent of the production of coal in India<sup>40</sup>. Further, Gondwana coal<sup>41</sup> is found in the states of Jharkhand, Odisha, Chhattisgarh, West Bengal, Madhya Pradesh, Andhra Pradesh, Maharashtra, Uttar Pradesh, Bihar, Sikkim, and Assam.

Figure 4: State-wise inventory of geological resources of coal in Gondwana Coalfields of India as of 1st April 2021



Source: [CoalDirectory2020-21.pdf \(coalcontroller.gov.in\)](https://www.coalcontroller.gov.in/writereaddata/files/download/coaldirectory/CoalDirectory2020-21.pdf)

Furthermore, Figure 5<sup>42</sup> depicts the state-wise production of coal and supports the claim that **Jharkhand was one of the top four states coal-producing states**. The state produced 119,295 MT of coal during the year 2020-21. One of the prominent inferences drawn from Figure 5 is that, **even though Jharkhand ranked fourth in terms of coal production, the value for the same is the highest as compared to all other coal-producing states**, surpassing the state of Chhattisgarh which produced around 40 MT more coal than Jharkhand in 2020-21.

<sup>37</sup> [https://justtransitioninitiative.org/wp-content/uploads/2021/10/CoalDependentCommunities\\_Report.pdf](https://justtransitioninitiative.org/wp-content/uploads/2021/10/CoalDependentCommunities_Report.pdf)

<sup>38</sup> [https://justtransitioninitiative.org/wp-content/uploads/2021/10/CoalDependentCommunities\\_Report.pdf](https://justtransitioninitiative.org/wp-content/uploads/2021/10/CoalDependentCommunities_Report.pdf)

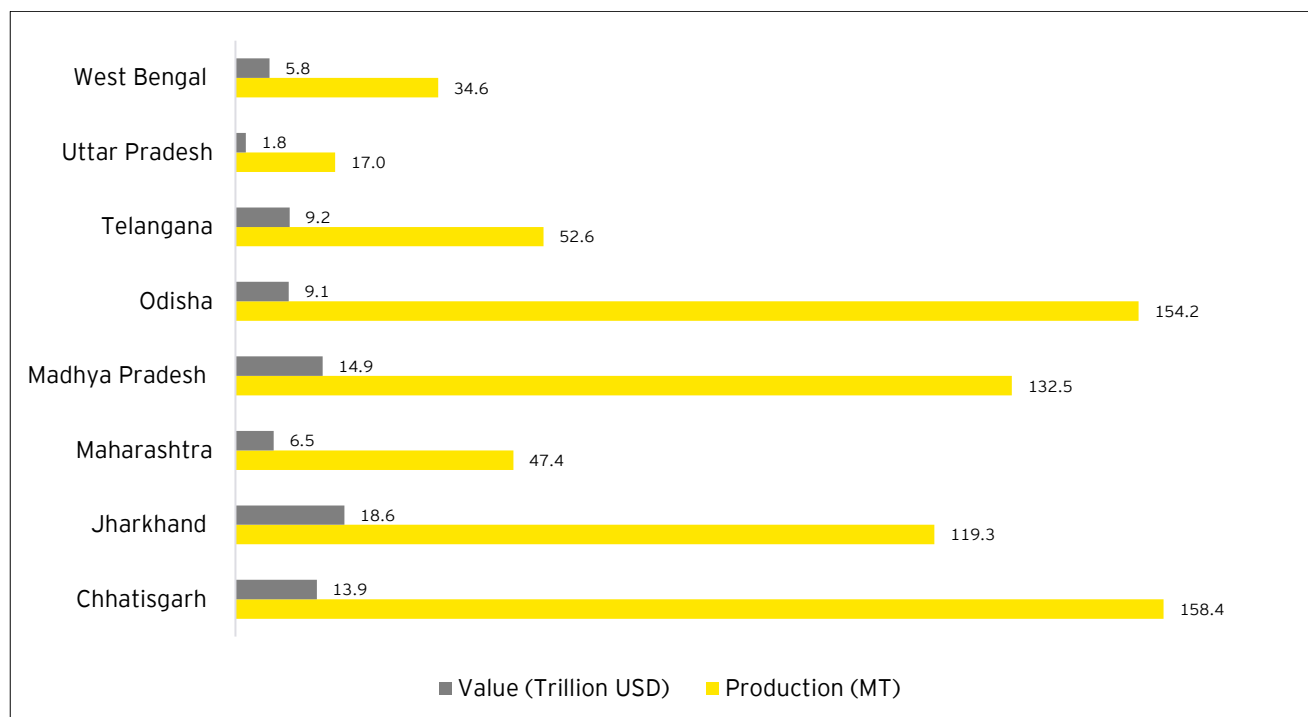
<sup>39</sup> <http://www.coalcontroller.gov.in/writereaddata/files/download/coaldirectory/CoalDirectory2020-21.pdf>

<sup>40</sup> <https://www.pmfias.com/coal-in-india-gondwana-coal-tertiary-coal-coking-coal-non-coking-coal/>

<sup>41</sup> [https://www.msu.ac.in/econtents/1895\\_Distribution%20of%20Coal%20&%20Petroleum%20in%20India.pdf](https://www.msu.ac.in/econtents/1895_Distribution%20of%20Coal%20&%20Petroleum%20in%20India.pdf)

<sup>42</sup> <http://www.coalcontroller.gov.in/writereaddata/files/download/coaldirectory/CoalDirectory2020-21.pdf>

Figure 5: State-wise production (MT) and value (Billion Rs) of coal during 2020-21.



Source: <http://www.coalcontroller.gov.in/writereaddata/files/download/coaldirectory/CoalDirectory2020-21.pdf>

The structure of the coal sector ecosystem in Jharkhand supports the claim that economic activity stemming from and associated with coal mining relies on an intricate and delicate balance. Currently, all companies involved in the mining and power generation of coal are required to pay royalties and taxes to all levels of government<sup>43</sup>. It has been observed that these taxes and royalties form a significant portion of the national government's total annual revenue, adding up to almost 3%<sup>44</sup>. **In Jharkhand, these taxes and royalties make up almost 8% of the state government's revenue**<sup>45</sup>. In addition to the public sector, the coal sector ecosystem also relies on the private sector. Along with contributing to the state's and district's local revenue, coal companies mandatorily spend under the head of corporate social responsibility (CSR) in the states, which is a key part of the larger coal sector ecosystem. Coal companies spent nearly 116 crore INR (16 million USD) through CSR payments in 2020.<sup>46</sup> As of October 2022, coal-producing district governments in Jharkhand collected 7786 crore INR (953 million USD)<sup>47</sup> under DMF funds, in respect of lignite and coal.

A review of India's top mining districts demonstrated that in districts that produce 10MT or more coal each year, 50% of their population can be categorized as 'multidimensionally poor', wherein they have abysmal conditions of health, living standards, and education<sup>48</sup>. Moreover, as per iForest's report on "Just Transition in India" it can be inferred that within the inner dealings of Jharkhand's coal sector, those with political clout and authorities of coal mining are known for collusion to hold on to power. It has been observed that families engaged with coal, tend to run for elections, as a means to influence coal sector politics<sup>49</sup>. These findings all point towards the hypothesis that due to the extremely vast nature of the coal sector economy, there are many direct and indirect stakeholders at play.

**This state-level trend for Jharkhand remains in line with the overall national trend regarding the future of coal mining.** Based on stakeholder interactions, it is expected that coal demand and supply will increase in Jharkhand in the foreseeable future. Reports have explained that **in June 2020, there were 95 working and 108 temporarily discontinued or non-working coal mines in Jharkhand**<sup>50</sup>. The mine closure has been a recent concern for the stakeholders since studies on unplanned mine closure show that closure has been most definitely followed by a surge in unemployment, poverty, and net outmigration

<sup>43</sup> [https://justtransitioninitiative.org/wp-content/uploads/2021/10/CoalDependentCommunities\\_Report.pdf](https://justtransitioninitiative.org/wp-content/uploads/2021/10/CoalDependentCommunities_Report.pdf)

<sup>44</sup> [https://justtransitioninitiative.org/wp-content/uploads/2021/10/CoalDependentCommunities\\_Report.pdf](https://justtransitioninitiative.org/wp-content/uploads/2021/10/CoalDependentCommunities_Report.pdf)

<sup>45</sup> [https://justtransitioninitiative.org/wp-content/uploads/2021/10/CoalDependentCommunities\\_Report.pdf](https://justtransitioninitiative.org/wp-content/uploads/2021/10/CoalDependentCommunities_Report.pdf)

<sup>46</sup> [https://justtransitioninitiative.org/wp-content/uploads/2021/10/CoalDependentCommunities\\_Report.pdf](https://justtransitioninitiative.org/wp-content/uploads/2021/10/CoalDependentCommunities_Report.pdf)

<sup>47</sup> <https://mines.gov.in/writereaddata/Content/DMF%20data.pdf>

<sup>48</sup> [https://iforest.global/wp-content/uploads/2021/04/iFOREST\\_Just\\_Transition\\_In\\_India.pdf](https://iforest.global/wp-content/uploads/2021/04/iFOREST_Just_Transition_In_India.pdf)

<sup>49</sup> [https://iforest.global/wp-content/uploads/2021/04/iFOREST\\_Just\\_Transition\\_In\\_India.pdf](https://iforest.global/wp-content/uploads/2021/04/iFOREST_Just_Transition_In_India.pdf)

<sup>50</sup> [https://iforest.global/wp-content/uploads/2021/04/iFOREST\\_Just\\_Transition\\_In\\_India.pdf](https://iforest.global/wp-content/uploads/2021/04/iFOREST_Just_Transition_In_India.pdf)



from a region. It has also resulted in social protest and political unrest in some regions<sup>51</sup>. This is derived from an in-depth study conducted in the district of Ramgarh, where production has decreased in two-thirds of the district's mines in the past 3 years<sup>52</sup>.

## 2.3 Need for a 'Just' Transition in Jharkhand

The concept of 'Just' Transition has gained massive limelight in the planning and negotiation of the phase-down of coal production and consumption and other high-carbon practices. **'Just Transition' in the Indian coal mining context, addresses the economic vulnerabilities due to the potential loss of livelihood of the coal mine workers.** It stresses on the ideas of facilitating economic diversification and livelihood promotion for the reintegration of the miners in the alternate sectors. **'Just' Transition in India supports the idea that various reskilling programs will enable the affected miners to gain new skills and resources to diversify themselves out of the coal mining industry.** Furthermore, entrepreneurship development and promoting MSMEs are expected to be the key factors in reviving and diversifying the economy of coal-dependent industry towns.<sup>53</sup>

Recently, 'Just' Transition conversations have become very dynamic. There have been calls for international cooperation associations such as the G20 to work towards actively including 'just' transition agendas to effectively discuss a global framework for energy transitions<sup>54</sup>. Many multi-lateral development banks (MDBs) have researched just transitions in developing nations and the way in which they can support these countries. In 2019, MDBs such as the African Development Bank Group, European Investment Bank, Asian Development Bank, Islamic Development Bank, and others issued a statement reinforcing their commitment to supporting Just Transitions<sup>55</sup>. They set out **five key principles upon which their support for just transition will be based.** These principles included ensuring that MDB support is aligned with the Paris Agreement and enables countries to accomplish the global Sustainable Development Goals (SDGs). The second principle entails MDBs providing support toward investments that shift the focus from economic activities which provide high levels of GHG emissions through policy engagement, financing, knowledge sharing, and technical advice. The third and fourth principles are focused on MDB support for a just transition by mobilising sources of private and public funding, and building on existing MDB policies to deliver long-term, structural economic transformation while mitigating negative socio-economic impacts associated with the transition to a net-zero economy. The fifth principle set out by MDBs requires support for transparent and inclusive just transitions with robust implementation and monitoring processes involving all stakeholders and promoting inclusion and gender equality. These principles indicate the pivotal role which many MDBs can play in supporting just transition in developing nations such as India, Indonesia, and South Africa. Such countries have economies that are heavily dependent on coal and the idea of a just transition brings forth concerns over loss of employment, profits, and economic activities (organised and unorganised, etc.).

Such an increasing concern can be seen in India towards labour displacement in the existing coal value chains and transitions toward sustainable forms of energy. Recent trends in using renewable sources such as solar energy for electricity generation identify that the cost of electricity from coal is losing its cost advantage. It has been observed that the supply of affordable 24x7 electricity from solar and wind with battery storage is becoming a reality.

As the key decision-making stakeholders, the Central and State Governments need to institutionalise and prioritise the concept of a just transition. The Ministry of Coal is in the process of **establishing a Just Transition division** to facilitate sustainable coal mine closure plans for areas economically dependent on the same.<sup>56</sup> Concurrently, the Ministry also has plans to start **a partnership with the World Bank to secure funding for such mine closures.** The World Bank will also develop a Detailed Project Report that will take into account three key aspects of a just transition, including **institutional governance, people and communities, and environmental reclamation and re-purposing of lands and assets.**<sup>57</sup> At the State Level, Jharkhand constituted a task force to understand the impact of transitioning to non-fossil fuel sources, keeping in mind the state's energy needs.<sup>58</sup> Specifically, the task force will aim to assess the **effects of gradual coal mine closures and coal-based industries on the communities,** directly and indirectly, dependent on them.<sup>59</sup>

Nonetheless, to accelerate 'Just' Transition, existing evidence indicates **there is a need to further involve worker organisations, and public and private sector businesses from both the coal sector and the emerging renewable energy sector in an inclusive dialogue that provides opportunities to identify potential positive and negative impacts.** The

<sup>51</sup> [https://iforest.global/wp-content/uploads/2021/04/iFOREST\\_Just\\_Transition\\_In\\_India.pdf](https://iforest.global/wp-content/uploads/2021/04/iFOREST_Just_Transition_In_India.pdf)

<sup>52</sup> [https://iforest.global/wp-content/uploads/2021/04/iFOREST\\_Just\\_Transition\\_In\\_India.pdf](https://iforest.global/wp-content/uploads/2021/04/iFOREST_Just_Transition_In_India.pdf)

<sup>53</sup> <https://ficci.in/spdocument/23589/studies.pdf>

<sup>54</sup> <https://climatenetwork.org/resource/just-transition/>

<sup>55</sup> <https://www.adb.org/sites/default/files/related/238191/MDBs-Just-Transition-High-Level-Principles-Statement.pdf>

<sup>56</sup> [https://wap.business-standard.com/article-amp/economy-policy/coal-ministry-to-have-a-just-transition-division-wb-to-provide-1-1-mn-122061501138\\_1.html](https://wap.business-standard.com/article-amp/economy-policy/coal-ministry-to-have-a-just-transition-division-wb-to-provide-1-1-mn-122061501138_1.html)

<sup>57</sup> [https://wap.business-standard.com/article-amp/economy-policy/coal-ministry-to-have-a-just-transition-division-wb-to-provide-1-1-mn-122061501138\\_1.html](https://wap.business-standard.com/article-amp/economy-policy/coal-ministry-to-have-a-just-transition-division-wb-to-provide-1-1-mn-122061501138_1.html)

<sup>58</sup> <https://energy.economictimes.indiatimes.com/news/oil-and-gas/jharkhand-task-force-set-up-to-tap-green-fuel/95443127>

<sup>59</sup> <https://energy.economictimes.indiatimes.com/news/oil-and-gas/jharkhand-task-force-set-up-to-tap-green-fuel/95443127>

involvement of all stakeholders and shareholders in dialogue and participation to build trust is of the utmost importance. Reports have remarked that workers and communities, along with the public, need to understand which changes are happening and why, who might be affected, and what can be done in response. They also need to know that their voices are heard and that there is a commitment to a managed and structured 'Just' transition. A 'Just' Transition in India will provide modern services to those most burdened and support a transition toward a lower-carbon economy.

During the interactions with a variety of stakeholders, it was observed that the **need for a 'Just' Transition exists on the premise that there will be a drastic change within the coal industry.** In the absence of such a drastic change, and rather a slow-phased transition of coal, all stakeholders concurred that the intricate coal market and economy in India would be able to adjust.

“

*'Just' Transition is required only if there is going to be a termination of jobs during the short-term period, for a large number of workers. Otherwise, it can be considered to be a gradual transition with not much churn, as people will be leaving the sector, but the same amount will not be joining it. A crisis will only arise if policymakers say that coal usage is going to decrease drastically. However, the government has not made any such indication.*

Director (Climate Policy) at a think tank

”

Contrary to these statements, some stakeholders presented a different perspective, wherein they explained that any support, including through 'Just' Transition policies will be needed during a coal phase down.

“

*All job roles will be affected if a coal phase-down happens. The market will also be disturbed and impacted since a majority of residents from the districts are either direct or indirect workers. The coal market will end, leading to a huge loss of jobs for both direct and indirect workers, since there is no other industry in the area other than coal.*

Labour contractor at a contracting organisation in Bokaro

”

This differing viewpoint on the approaches towards a 'Just' Transition' can be attributed to the lack of clear timelines and the absence of a plan to support a transition.

“

*Once a mine has been completely de-mined and closed, Coal India Limited steps away from the area and the mine is re-filled. Upon completion of filling, the land is handed over to the state government, which then re-allots the land to other players like renewable energy companies, coal washeries, thermal power plants, etc. This way, the inhabitants around closed mines receive employment opportunities. At the same time, mining has a huge workforce. The proportion of people hired in projects or industries that will replace mining, will be less than what mining provides. This is where the role of skilling and 'Just' Transition comes in.*

Director (Energy) at a think tank

”

Some stakeholders provided insight on the need for a 'Just' Transition in Jharkhand while keeping the views of the most directly involved stakeholders in mind.

“

*To follow through on Just Transition - policy formation on a national level, skill training, financial support from the state government, awareness drives, and CSR activities - are all of the utmost importance. It is recommended that plans and strategies are focused on alternative livelihood generation.*

Official in Government of Jharkhand

”

Additionally, it was observed that the policymakers' approach is focused more towards a 'Just' Energy wherein the ministry has strategies and plans in place to prevent mass migration and economic collapse of district-level coal economies.

“


*The Ministry has a multidimensional plan of action to shift the coal industry towards a more ecological approach. This approach will maintain jobs and mitigate the crisis by preventing mass migration and the economic collapse of the coal economy.*

Official in Government of India

”

Overall, all interactions with the supply, demand, and policy side stakeholders indicated that there is a need for an intervention with regard to phase-down in the coal sector. While some believed that strong interventions such as 'Just' Transition policies will only be needed in case of a drastic change, others advocated for 'Just' Transition policies regardless of the rate of change.





**A lack of understanding, and absence of clear timelines and planning with respect to a just transition has led to differences in opinions among stakeholders involved in the coal sector.** A coal mine contractor presents a more anxious view regarding a possible phase-down, while a think tank member recommends a more laissez-faire approach towards an eventual coal phase-down.

# 3

## Profile of coal sector workers



### 3 Profile of coal sector workers

Given the extensive size and influence of the coal sector in India and Jharkhand, it is imperative to derive a better understanding of the workers who form an important part of this sector. Moreover, 'just' transition activities will be centred around their shift from the sector in a way that is socially and economically fair, which further builds on the need to delineate their profiles. Thus, this section elucidates the socio-economic status, employment details, overall health, and well-being (as a result of working in the coal sector) of direct organised and unorganised coal sector workers. These findings helped inform the recommendations around 'just' transition for such workers.

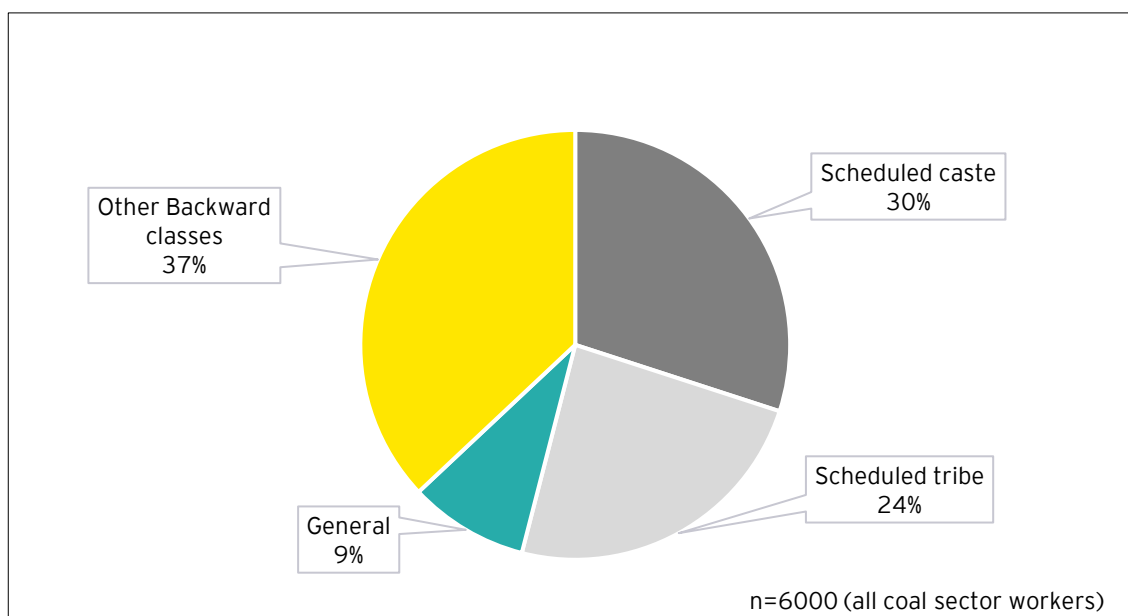
#### 3.1 Socio-economic profile

Data collection to understand the profile of the coal sector workers was conducted through a three-pronged approach consisting of a secondary literature review, focus group discussions (FGDs), and quantitative surveys. It was found collectively that; direct and indirect jobs constitute nearly 10 percent of current jobs in the state<sup>60</sup> of Jharkhand. Due to the large stake that the coal sector holds within the state, the complex contract ecosystem that accompanies it is the core of the political economy<sup>61</sup>. **It has been estimated that for every formal and direct employee, there are 2-3 contract labourers on the plant sites<sup>62</sup>.** Furthermore, to add to this complexity there are a large number of indirect and informal workers dependent on the coal sector - as estimated by the National Foundation for India, there are more than 13 million people indirectly dependent on the coal sector in India, and a majority of them are concentrated in the highest coal-producing states such as Jharkhand<sup>63</sup>. For ease of analysis and comprehension, the profile for coal sector workers will be approached through two main categories: organised and unorganised.

**Quantitative surveys were conducted with 6000 respondents** from five districts, Bokaro, Dhanbad, Chatra, Ramgarh, and Ranchi. Further, the **quantitative data was supplemented with 20 focus group discussions** spread across the five districts. Findings from both qualitative and quantitative components inform the analysis and understanding in this section.

Questions regarding the state of origin of workers showcased that 92% (on a base of 6000) hail from Jharkhand. Hence, the **majority of coal sector workers interviewed in this research were from the local communities**, with very few having migrated to these districts of Jharkhand. Figure 6 displays the social groups that respondents belonged to, wherein it was observed that the majority of the workers interviewed belonged to Other Backward Classes (37%) or Scheduled Castes (30%).

Figure 6: Social groups of coal sector workers



As demonstrated in Figure 7 and Figure 8, it was observed that among all districts, **57% (on a base of 6000) had 4 to 6 family members and at least 46% (on a base of 6000) were dependents**. The information displayed in this graph further elaborates

<sup>60</sup> [https://justtransitioninitiative.org/wp-content/uploads/2021/10/CoalDependentCommunities\\_Report.pdf](https://justtransitioninitiative.org/wp-content/uploads/2021/10/CoalDependentCommunities_Report.pdf)

<sup>61</sup> [https://justtransitioninitiative.org/wp-content/uploads/2021/10/CoalDependentCommunities\\_Report.pdf](https://justtransitioninitiative.org/wp-content/uploads/2021/10/CoalDependentCommunities_Report.pdf)

<sup>62</sup> <https://www.nfi.org.in/sites/default/files/publication/cti.pdf>

<sup>63</sup> <https://www.nfi.org.in/sites/default/files/publication/cti.pdf>



on the claim, that the **majority of communities around coal mines and power plants are heavily dependent on coal for any economic activity**. This statement is further supported by the fact that 74% (on a base of 6000) respondents stated that they were not the sole earners in their respective households.

Figure 7: Number of household members of coal sector workers

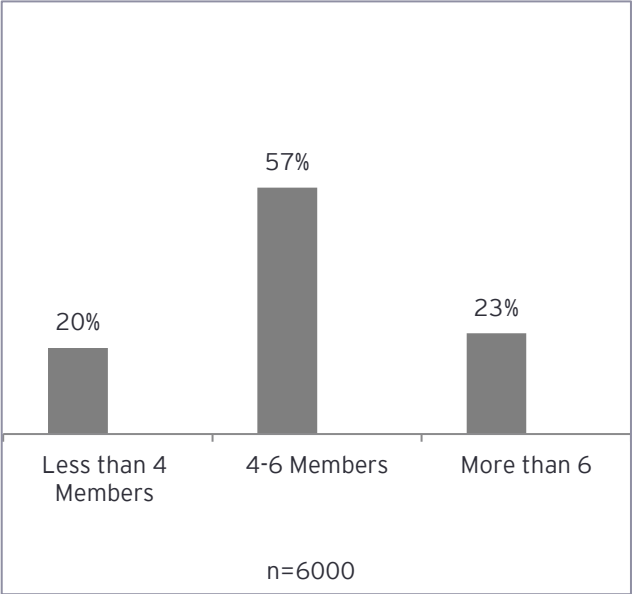
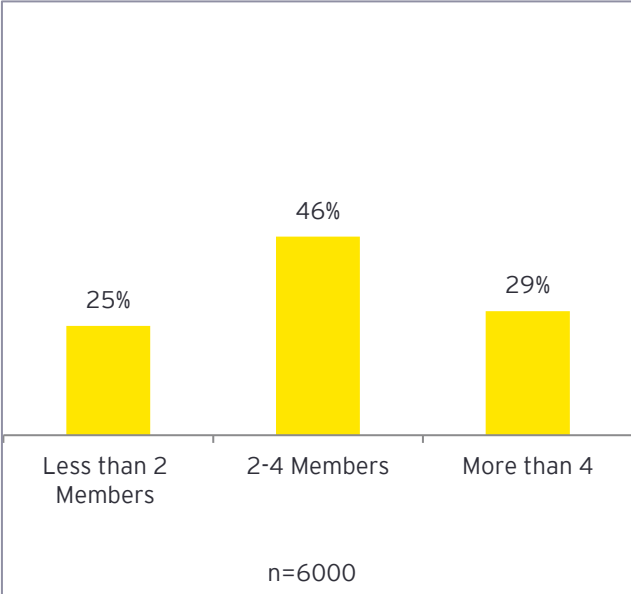


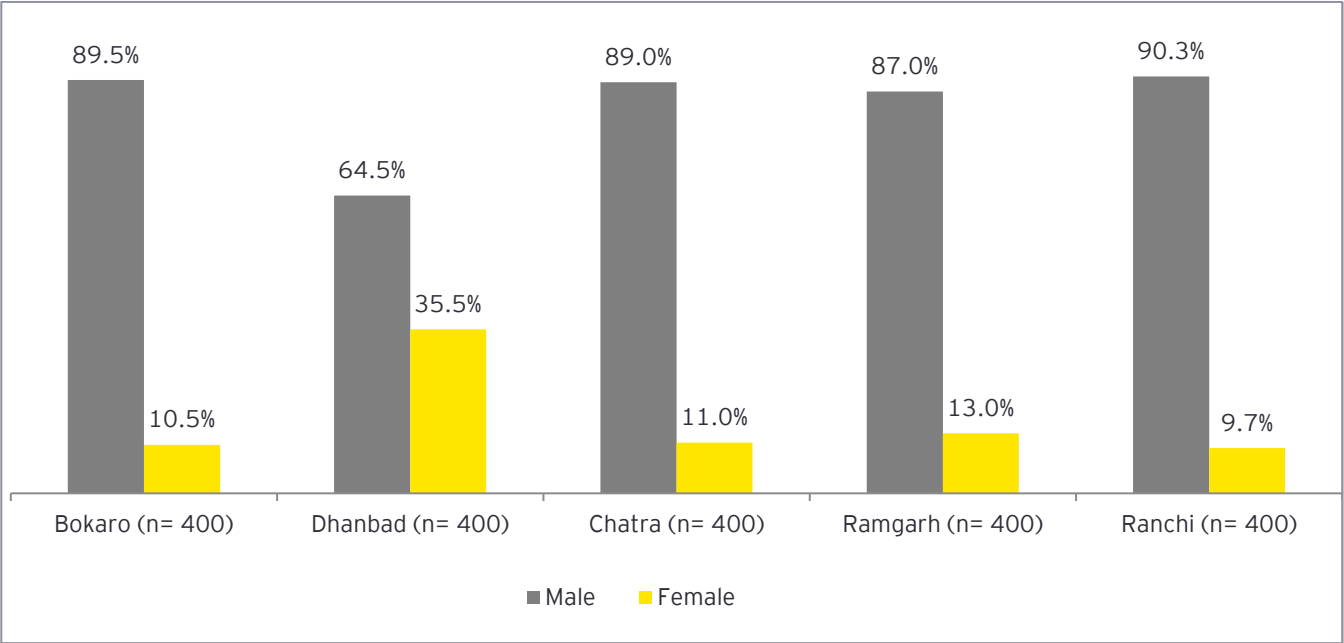
Figure 8: Number of dependent household members of coal sector workers



**Organised coal sector workers**

The organised category of coal sector workers in this research includes workers that have been employed formally and within the coal mining and coal power plants. It has been observed that a large disparity exists in gender distribution amongst the organised coal sector workers in all districts, with Dhanbad as an outlier.

Figure 9: Gender distribution of organised coal mine workers



As observed in Figure 9, there are consistent levels of gender disparity in all five districts, especially in Ranchi, which had the highest level of gender division - 90.3% of males and 9.7% of females.

Figure 10: Gender distribution of thermal power plant workers

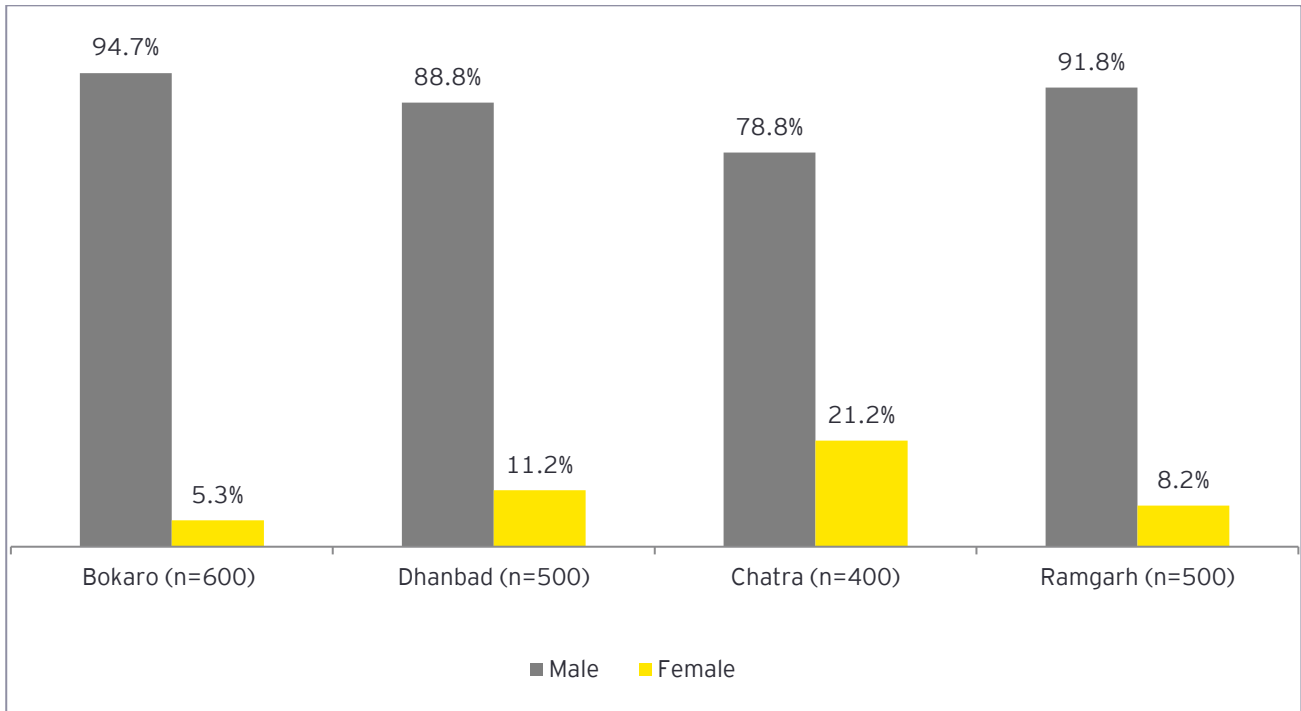
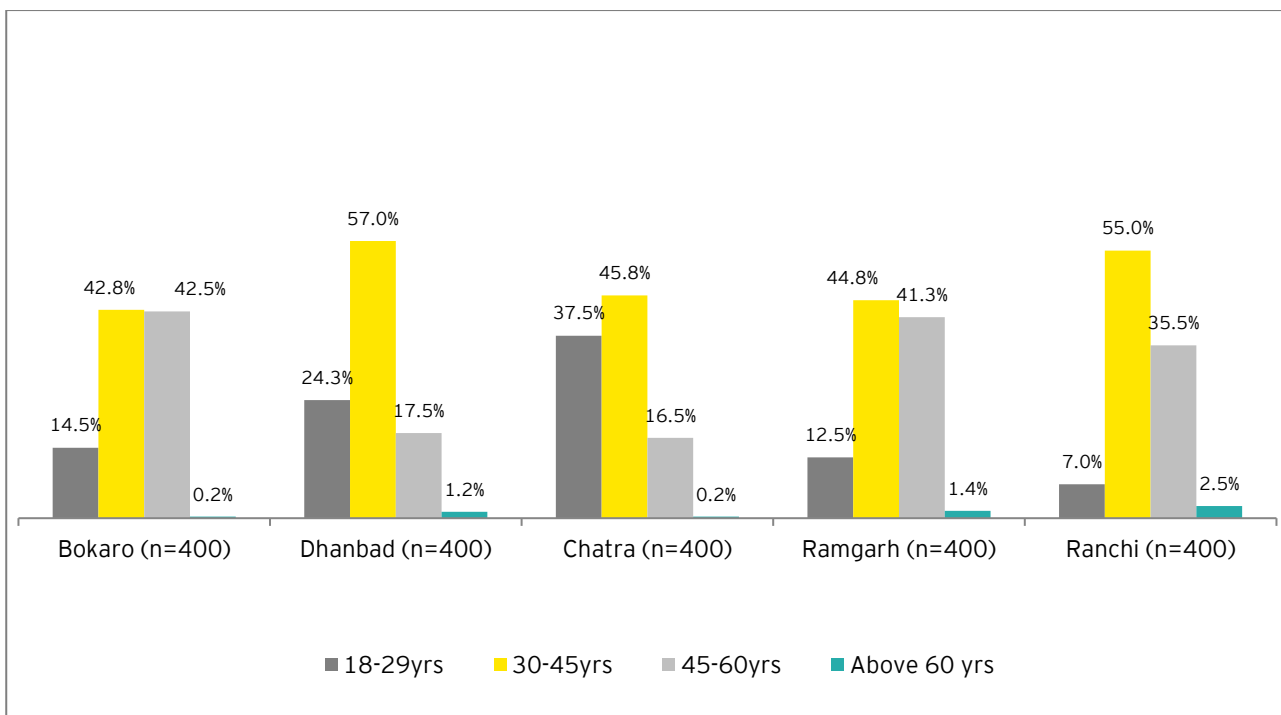


Figure 10 showcases a similar trend of **unbalanced gender divisions in all five districts amongst thermal power plant workers**, especially in Bokaro, where 94.7% respondents were males and only 5.3% respondents were females.

Additionally, a majority (49% on a base of 2000) of organised coal mine workers fall within the 30 to 45-years old age group. As can be seen in Figure 11, 57% of organised coal mine workers in Dhanbad were in the age bracket of 30 to 45 years old.

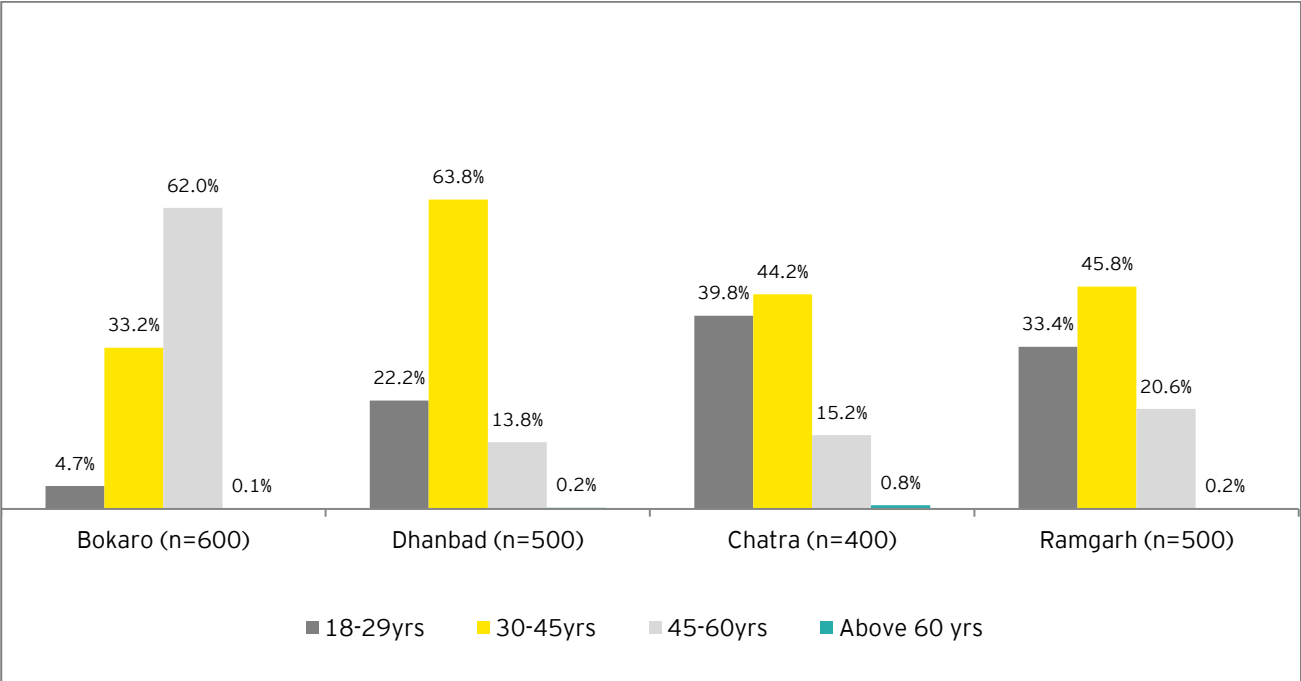
Figure 11: Age distribution of organised coal mine workers



A similar trend was found for thermal power plant workers in Jharkhand, wherein 45.2% (on a base of 2000) belong to the age bracket of 30-45 years. It is evident from Figure 12 that Bokaro stands as an outlier, with the majority (62%) falling within

the age group of 45-60 years old. The age distribution aids in understanding specifically the responses and suggestions concerning the future of coal mining.

Figure 12: Age distribution of thermal power plant workers

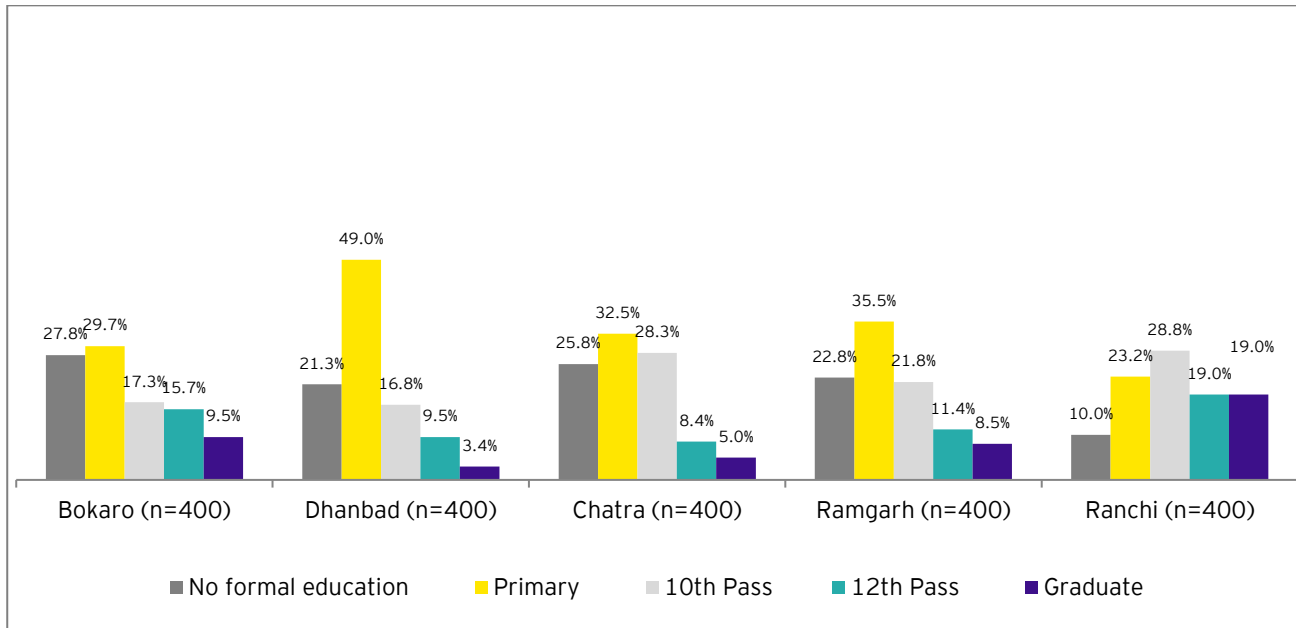


Considering the envisaged timelines for reducing India’s dependency on coal, **‘Just’ transition initiatives around alternate skilling have to be targeted towards 18 to 45 years old coal sector workers** - who form 72.2% of the workforce interviewed in this research.

Another key socio-economic indicator for coal sector workers is their **level of education**. The surveys portrayed that **most organised coal mine workers (33.9% on a base of 2000) had obtained at least a primary level education**. It is evident from Figure 13 that Ranchi had the highest (19%) coal mine workers reported to be graduates, whereas Bokaro had the highest (27.8%) level of coal mine workers who did not receive any formal education.

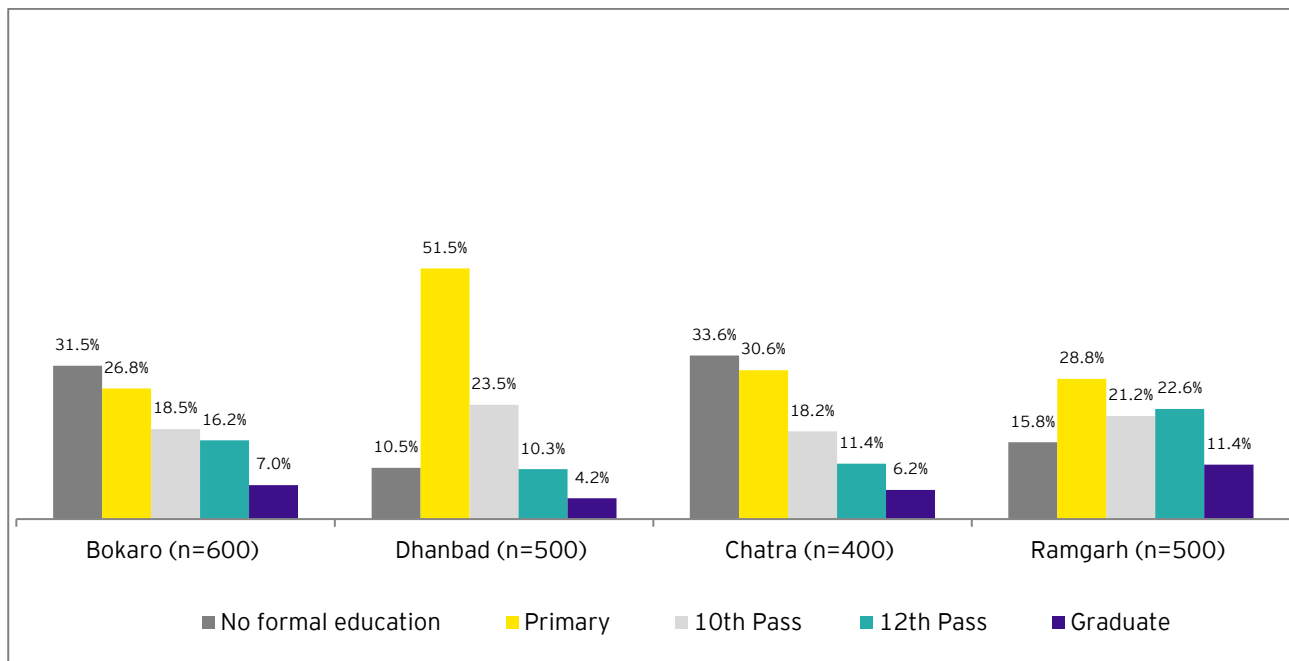


Figure 13: Education levels of organised coal mine workers



A similar trend can be seen with the education levels of workers at thermal power plants in Figure 14, wherein the average education level of workers was primary education. Workers from Dhanbad were the most educated, where a majority (89.6%) of workers had received some formal education. Chatra and Bokaro, however, had the most workers amongst all five districts that did not have any formal education (33.6%, on a base of 400 and 31.5% on a base of 600, respectively).

Figure 14: Education levels of thermal power plant workers



The education levels of workers vis-à-vis their age brackets display an inverse relation - a trend was seen that the lower the levels of education among organised coal sector workers, the higher their respective ages. For example, in Bokaro, 62% thermal power plant workers (on a base of 600) fell in the age bracket of 45 to 60 years and concurrently, most thermal power plant workers in the district were not formally educated. This trend was depicted among organised coal mine workers

of Bokaro as well. The indirect relationship between age and education was highly pronounced in Dhanbad. The majority of organised coal mine workers (57% on a base of 400) and thermal power plant workers (63.8% on a base of 500) in Dhanbad were young and belonged to the age bracket of 30 to 45 years, and simultaneously, ~80% of organised coal mine workers and ~90% of thermal power plant workers had received some level of formal education. It can be inferred that **young workers, being formally educated, might be more receptive to being skilled**, which expands the potential to explore skilling and capacity-building exercises with them.

**Young workers in coal mines and thermal power plants, being formally educated, might be more receptive to being skilled**, which expands the potential to explore skilling and capacity-building exercises with them

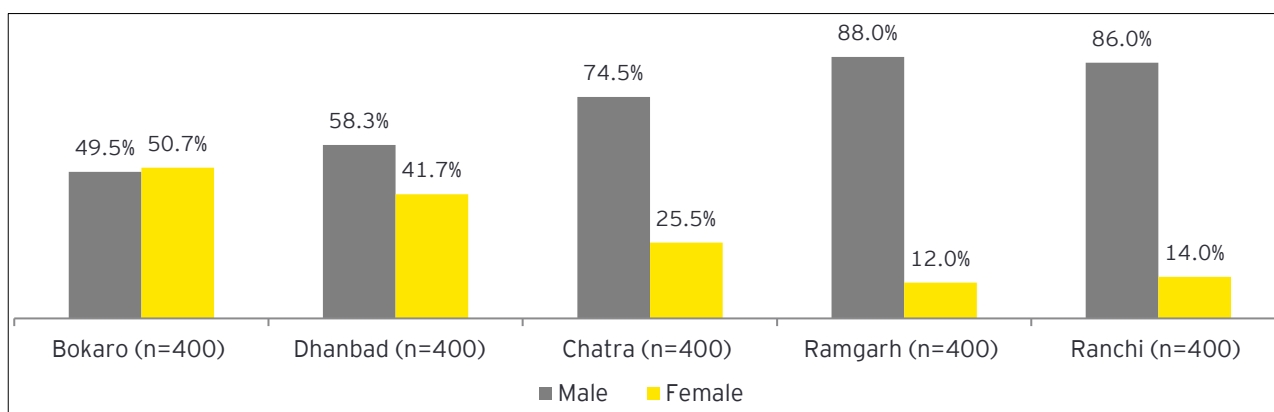
The socio-economic indicators showcased a large gender disparity, wherein the majority (86.4%, on a base of 4000) of organised coal sector workers in all five districts were males. It was also observed that **the median age range for respondents fell between 30 to 45 years old**. Additionally, in terms of the education level, while there was a mix of responses, **most respondents across all districts had completed primary-level education**. It is important to note that **in some districts, there were a large number of respondents who did not receive any formal education**. Understanding the level of education of coal sector workers is especially important since it informs any suggestions that are made regarding reskilling programs linked with alternate livelihoods for the workers.

#### Unorganised coal sector workers

The unorganised category in this research included all workers that are informally employed in the coal sector and mainly comprised of coal pickers, that is those that scavenge coal for a living. These workers are dependent on the coal mines and thermal power plants for their livelihood without being contractually or formally employed at the mines or thermal power plants.

As observed in Figure 15, it is evident that the **gender distribution trend for unorganised coal sector workers differs from the gender distribution observed in organised coal sector workers**. While there is a larger gap visible between employed males and females in Chatra, Ramgarh, and Ranchi, the disparity is less pronounced in Bokaro and Dhanbad. In fact, in Bokaro, the percentage of females (50.7%) working in the unorganised coal sector is slightly higher as compared to males (49.5%). However, the gender disparity trend in Ramgarh and Ranchi mimics that of the organised coal sector workers and is dominated by males.

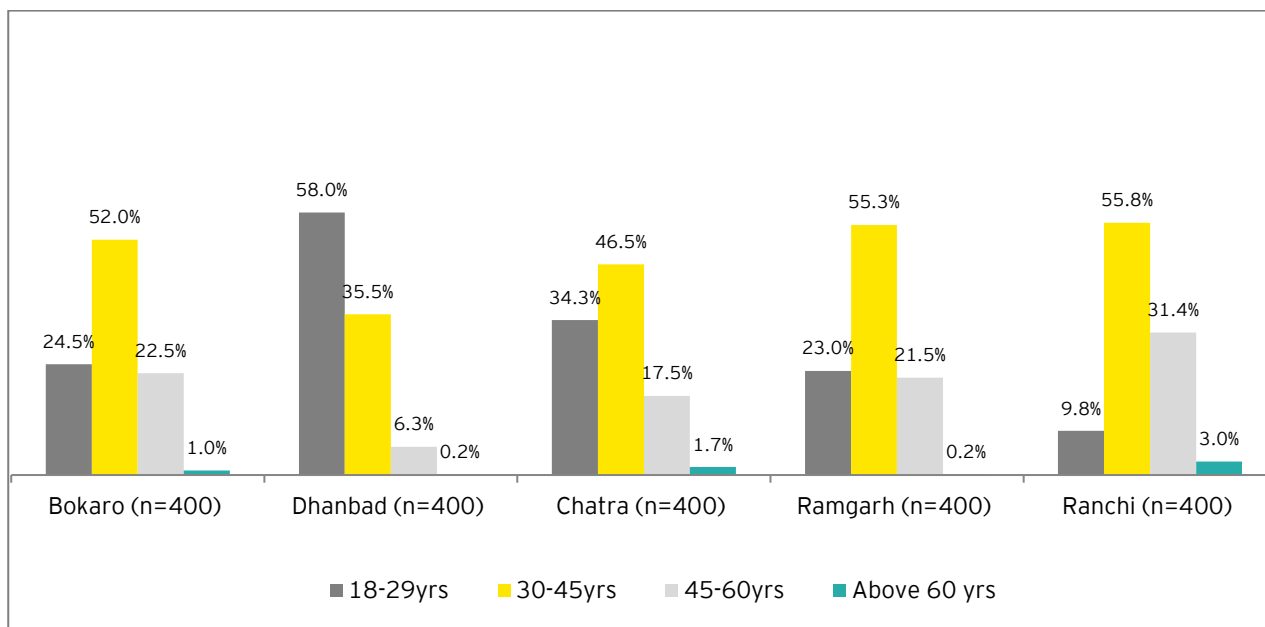
Figure 15: Gender distribution of unorganised coal sector workers



The age distribution of unorganised coal sector workers seems to mimic the trend of organised workers, with a clear exception in one of the districts - Dhanbad. Figure 16 demonstrates that in Dhanbad, a majority (58%) of respondents fell

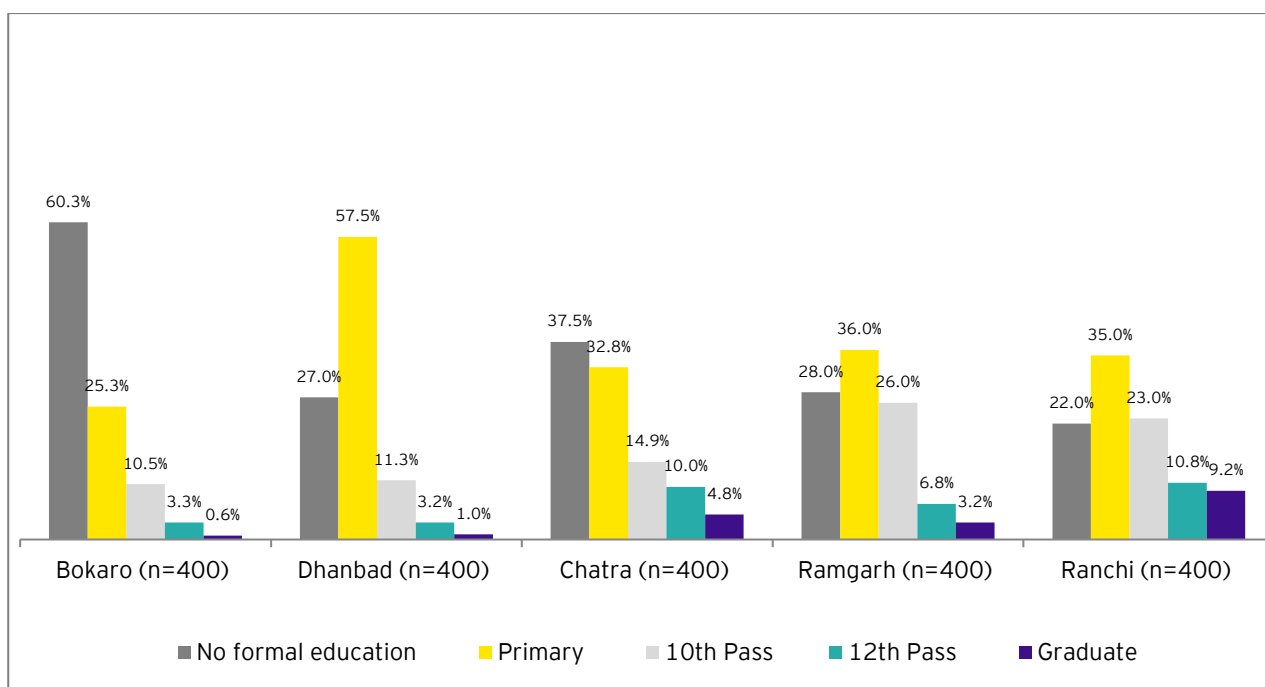
within the age category of 18-29 years, while the rest of the districts had their majority of workers within the 30-45 years old age bracket. Understanding this age distribution is imperative since it aids in understanding the attitude of workers regarding migration, finding alternative employment, and opportunities for reskilling.

Figure 16: Age distribution of unorganised coal sector workers



Among the unorganised coal sector workers, it was observed that a **consistent majority (34.9% on a base of 2000 respondents) did not receive any formal education**. This was specifically pronounced in Bokaro, as can be seen from Figure 17, where 60% respondents had not received any formal education. It is only in Dhanbad that the majority (58%) of workers received primary-level education. Overall, **only a small percentage (3.8% on a base of 2000) of unorganised coal sector workers were reported to be graduates**.

Figure 17: Education levels of unorganised coal sector workers





### 3.2 Employment details

The total number of direct employees at CIL as of April 1, 2022, was 248,550 in the state of Jharkhand.<sup>64</sup> This number forms a large part of the organised, formally employed workers in Jharkhand. However, due to the informal nature of the unorganised sector, it is difficult to ascertain the exact number of unorganised coal sector workers. It has been estimated that for every formal job, there are at least four informal jobs.<sup>65</sup>

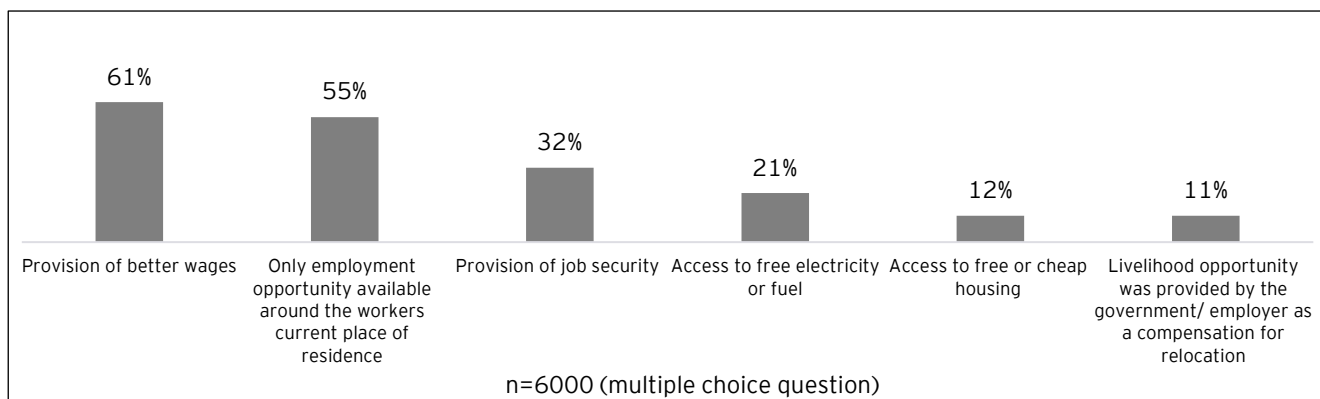
The **organised and direct jobs can be further categorized into two sections**. The first section includes the workers that have been directly employed by coal mining companies such as CIL and their subsidiaries. These employees are part of unions which ensures that they have fair compensation rates and access to health and safety measures. As per interactions with stakeholders during in-depth interviews, the second section of workers includes contractors engaged in coal mining operations that are also employed by coal mining companies such as CIL and their subsidiaries. It has been noted that according to the Economic Census of 2013, **only 3% of a district's working population is engaged directly with mining and quarrying<sup>66</sup>, and the rest are either informal or indirect workers.**

This is further corroborated by primary findings that indicated **only 37% of workers (base of 6000) had an employment contract with coal sector companies**. Chatra (89%, base of 1300) and Ranchi (86%, base of 800) account for districts with the highest percentage of workers who reported not having an employment contract.



Workers indicated multiple reasons which led them to work in the coal sector (as observed in Figure 18) reasons. The two most prevalent reasons (among six reasons) as indicated by the workers included the sector being the only available employment option (**55% on a base of 6000**) and the **provision of better wages (61% on a base of 6000)**.

Figure 18: Reasons coal sector workers prefer working for their current employers



**Despite having low job security, workers preferred working in the coal sector** due to the provision of better wages, as compared to the probable remuneration they would have earned while working in other available sectors in their surroundings.

**Most (42.4% on a base of 2000) organised coal mine workers had been working in the coal sector for more than 10 years.** Only a negligible amount of coal mine workers explained that their length of employment in the mines has been less than 6

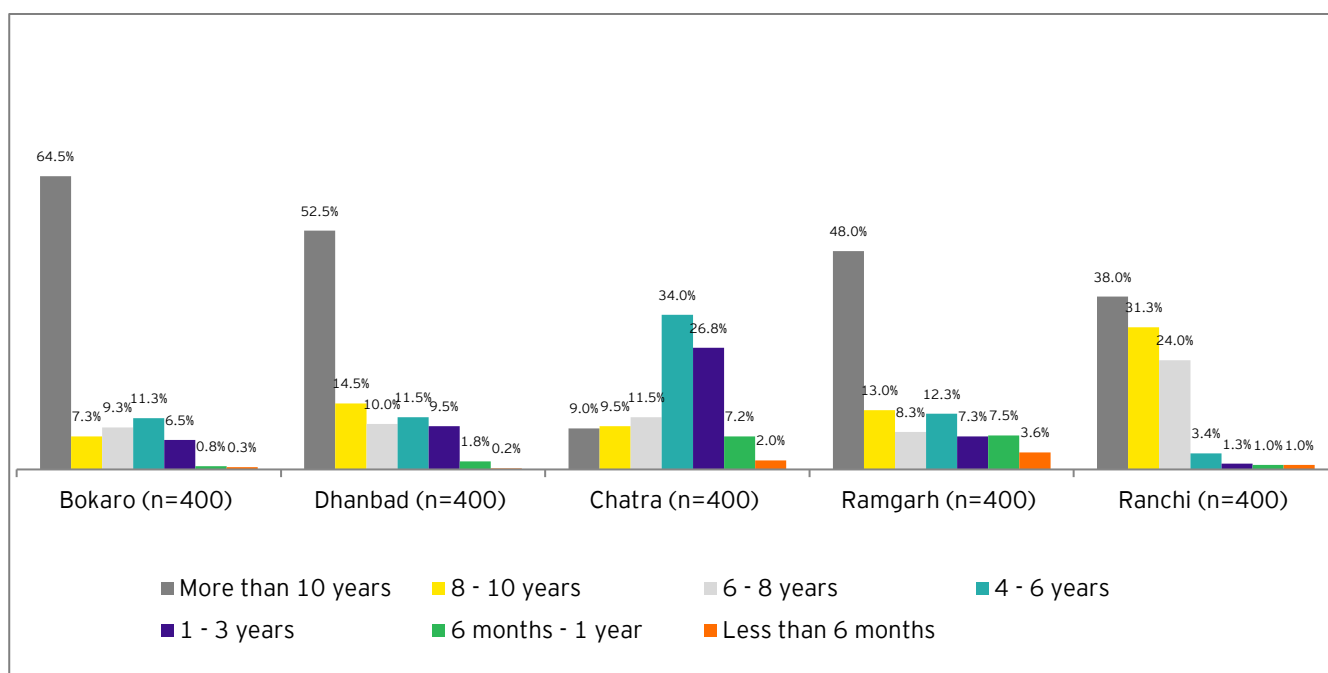
<sup>64</sup> World Bank presentation to the Ministry of Coal for providing Support to Achieving a Just Transition in India's Coal Sector

<sup>65</sup> [https://justtransitioninitiative.org/wp-content/uploads/2021/10/CoalDependentCommunities\\_Report.pdf](https://justtransitioninitiative.org/wp-content/uploads/2021/10/CoalDependentCommunities_Report.pdf)

<sup>66</sup> [https://iforest.global/wp-content/uploads/2021/04/iFOREST\\_Just\\_Transition\\_In\\_India.pdf](https://iforest.global/wp-content/uploads/2021/04/iFOREST_Just_Transition_In_India.pdf)

months (1.5% on a base of 2000) or even between 6 months to a year (3.7% on a base of 2000). Figure 19 demonstrates that Bokaro had the highest number of organised coal mine workers (64.5%) working for more than 10 years.

Figure 19: Duration of employment of organised coal mine workers



As shown in Figure 20, a majority (71.7%) of thermal power plant workers in Bokaro had worked in the coal sector for more than 10 years. However, in other districts, it was observed that there was no consistent trend in the duration of employment of thermal power plant workers. In Dhanbad, a majority ((27.3%) of workers had been employed for more than 10 years. On the other hand, 46.8% of workers in Chatra and 25.4% of workers in Ramgarh had been employed for 1 to 3 years.

Figure 20: Duration of employment of thermal power plant workers

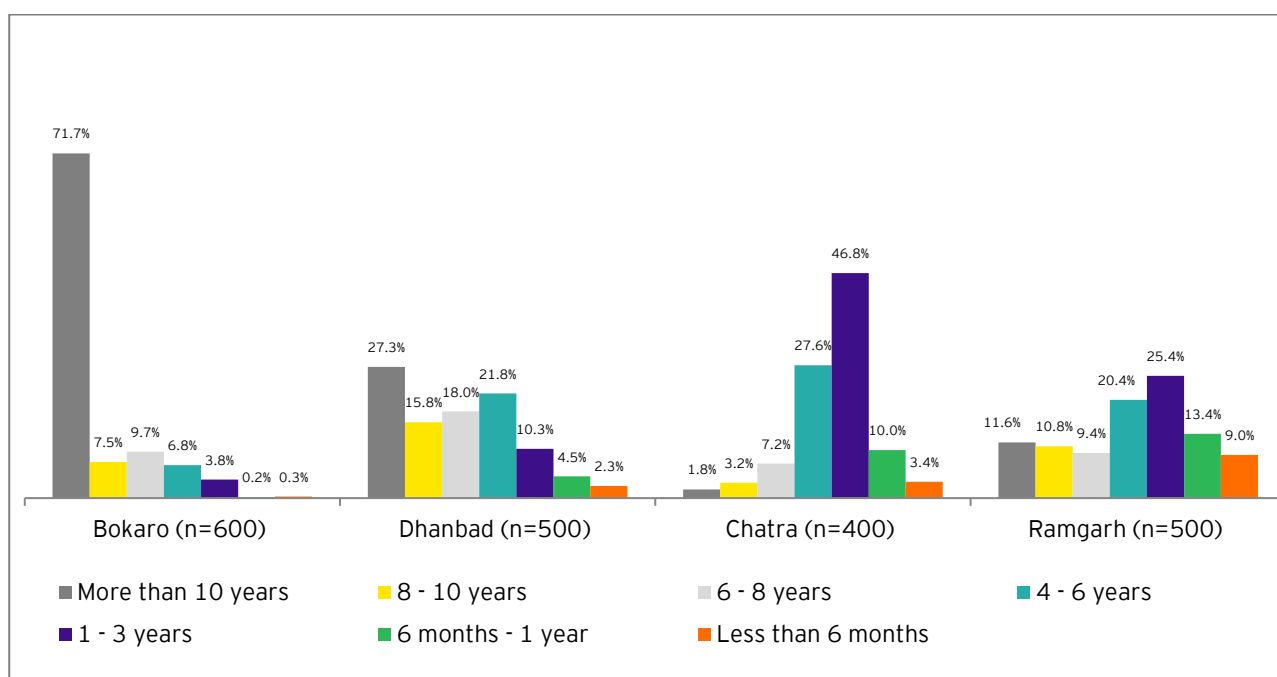
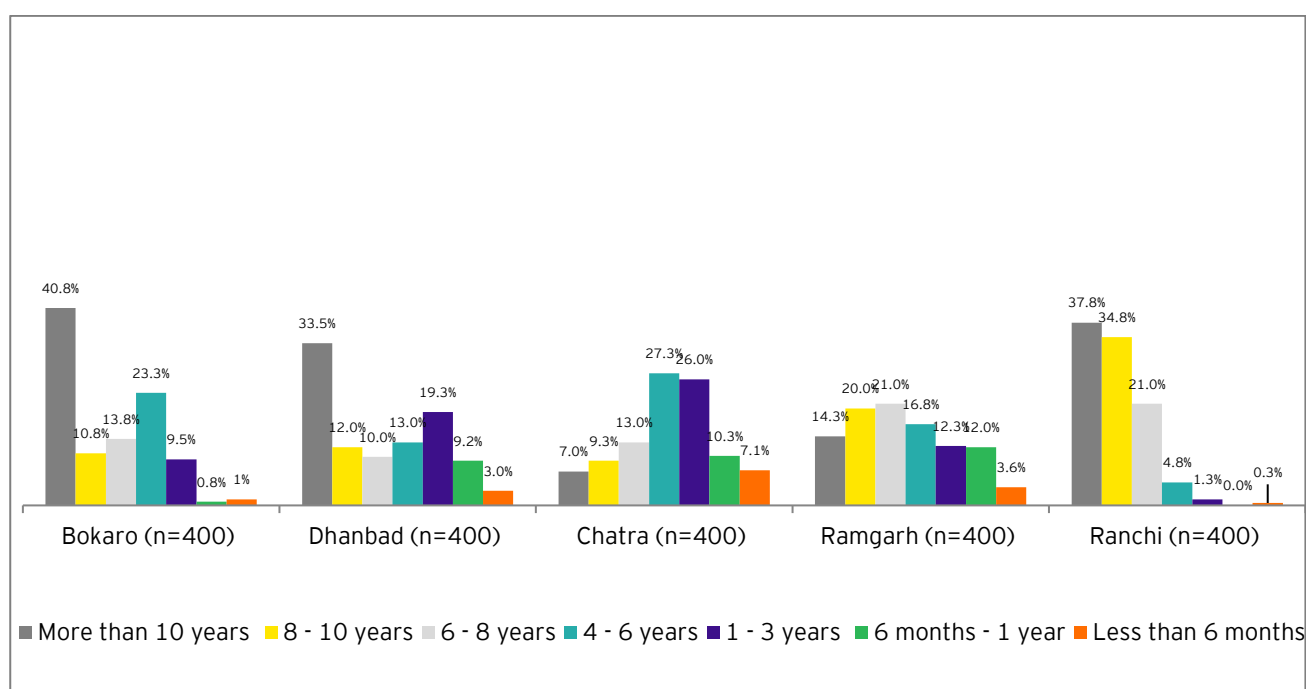


Figure 21 shows the duration of employment of unorganised coal sector workers. It can be observed that there is an even mix of responses among districts. In Bokaro 40.8% and in Ranchi 37.8% of workers have been working in the unorganised

coal sector for more than 10 years. This was pronounced in focus group discussions as well, where the workers highlighted that they had been working in this sector for 7 to 10 years. However, in the remaining three districts of Dhanbad, Chatra, and Ramgarh, there was a balance of responses with no specific bracket of years of employment that was a prominent outlier. Upon comparison with the duration of employment of organised and unorganised workers, it was observed that unorganised coal sector workers have been working for a mixed range of time durations. The focus group discussions also demonstrated that few unorganised coal sector workers were previously employed in the agriculture and construction sectors before transitioning to coal picking. Hence, via this lack of a consistent trend amongst all districts, it can be inferred that the nature of unorganised coal sector employment in these 5 districts of Jharkhand is informal and unstable.

Figure 21: Duration of employment of unorganised coal sector workers



Furthermore, through the focus group discussions, it was observed that many coal workers within the unorganised sector bring coal from mines and sell it to local tea shops, hotels and *dhabas*, and aggregators. Some of the coal that is collected is also used for daily household consumption. It has been estimated that unorganised workers are responsible for producing 15 million tons of coal a year in India.<sup>67</sup> Secondary literature has identified unorganised coal workers to be the most at risk, given that unorganised workers have lesser skills and education than workers in the organised sector. Workers in Ranchi indicated that since formal job roles in the sector have declined, many have been compelled to work as unorganised coal pickers.

“

*We are not bound to any individual or organisation. Usually, in the rainy season, we work as daily wage labourers - involved in the construction of roads or buildings, or involved in MNREGA work, or any other government scheme-related work. Sometimes we stand in the queue at the labour chowk in search of daily wage jobs.*

Views expressed by men working in the unorganised coal sector in Dhanbad

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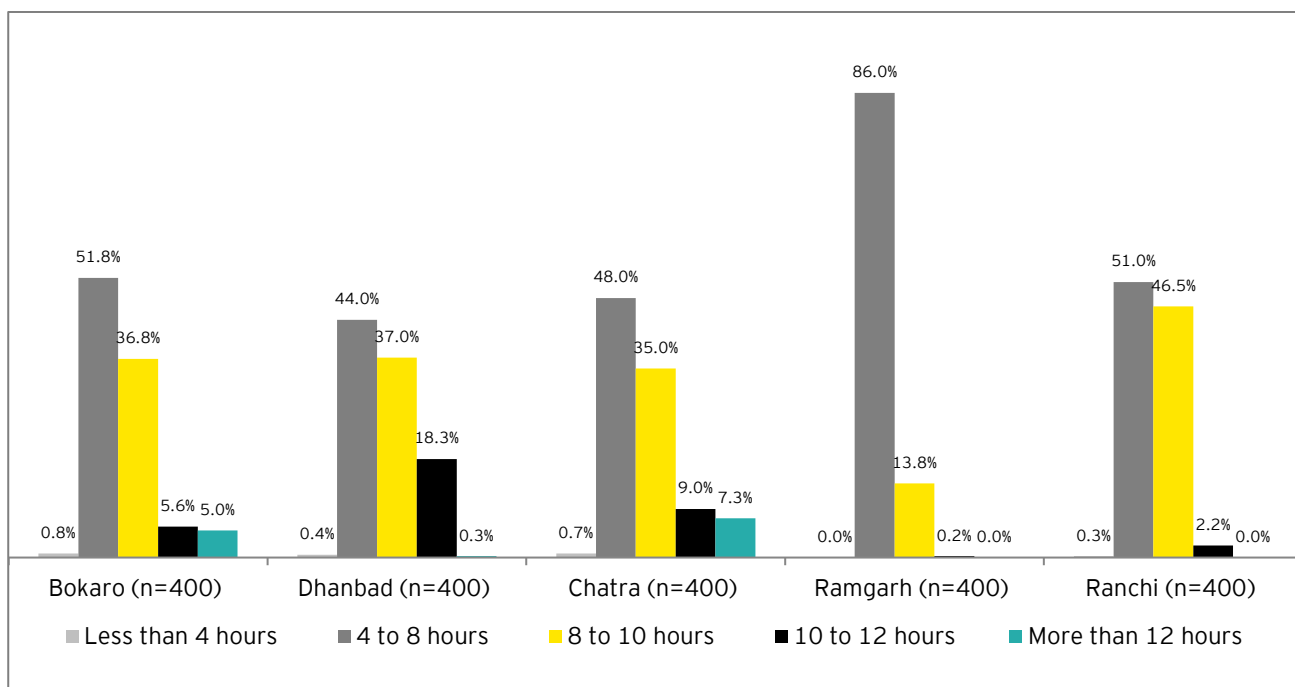
On a typical day, both organised coal mine workers (56.2% on a base of 2000) and (48.9% on a base of 2000) thermal power plant workers, reported working for 4 to 8 hours. Figure 22 shows that daily working hours of 86% of organised coal mine workers in Ramgarh worked for 4-8 hours a day. Furthermore, very few workers in all districts worked for less than 4

<sup>67</sup> [https://justtransitioninitiative.org/wp-content/uploads/2021/10/CoalDependentCommunities\\_Report.pdf](https://justtransitioninitiative.org/wp-content/uploads/2021/10/CoalDependentCommunities_Report.pdf)



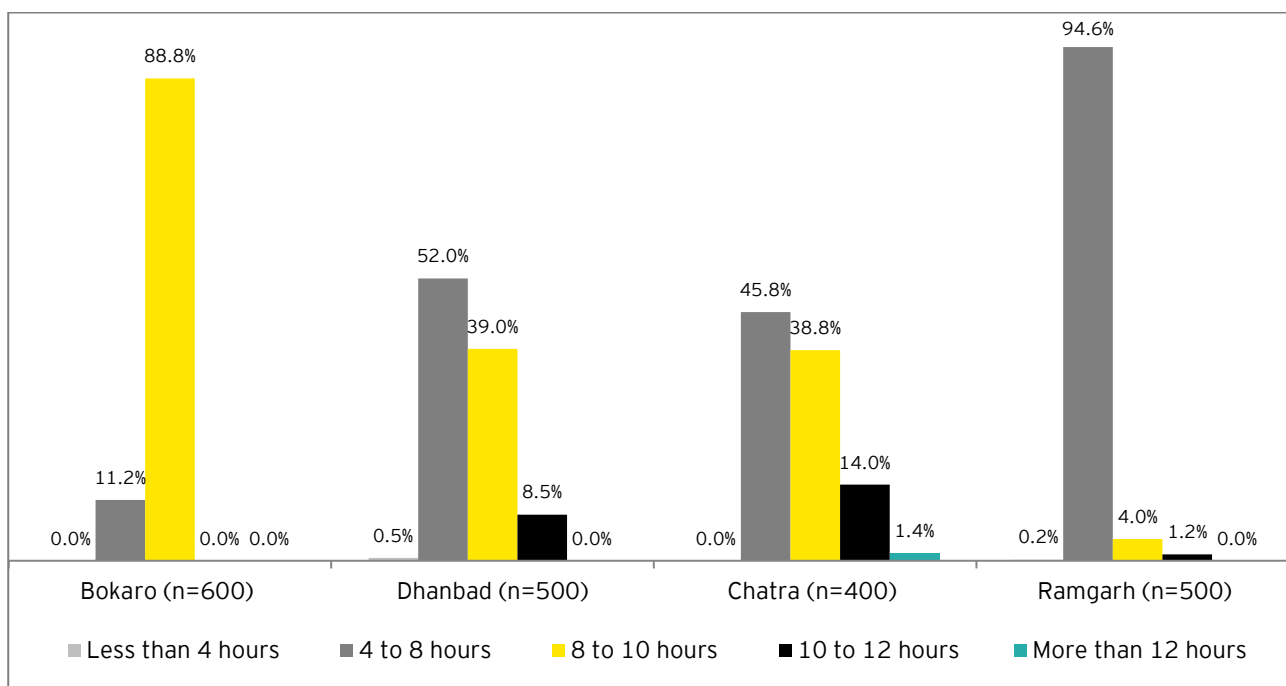
hours (0.5% on a base of 2000) or more than 12 hours (2.5% on a base of 2000) in a day. These trends reflect **regulated working hours with structure and stability for the coal mine workers.**

Figure 22: Daily working hours of organised coal mine workers



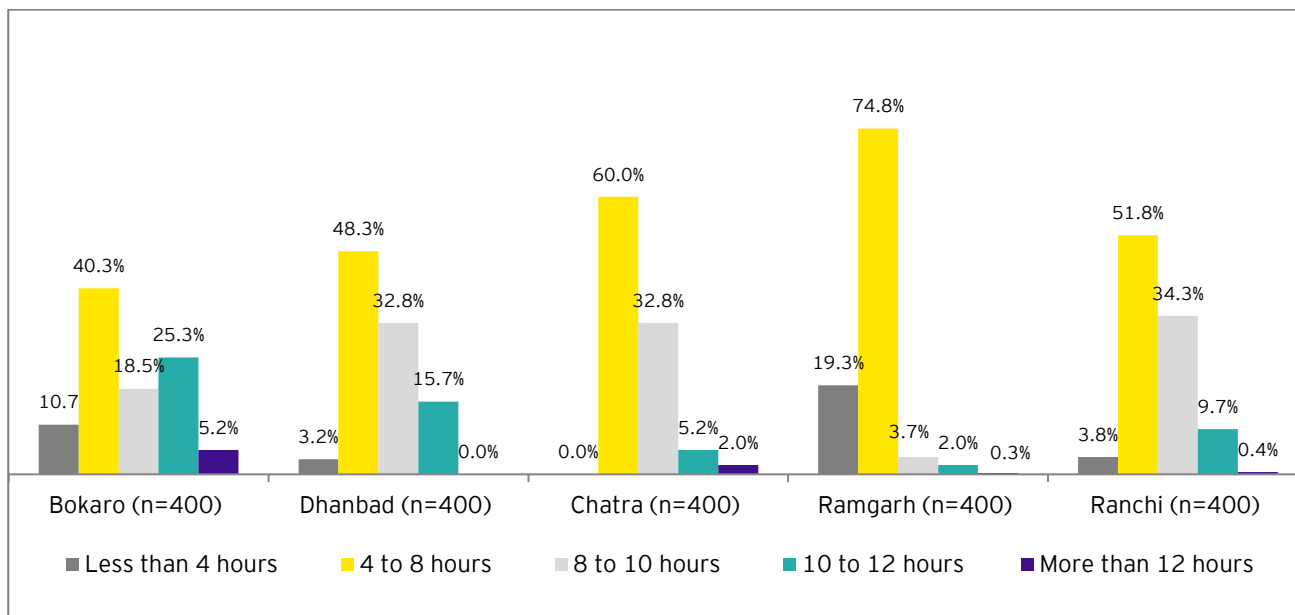
Similar trends were seen with thermal power plant workers in terms of their working hours (in Figure 23), wherein **94.6% of workers in Ramgarh reported a 4-8 hours working day.** However, an entirely different trend was seen in **Bokaro with 88.8% of workers reporting 8 to 10-hour long working days.** In Dhanbad and Chatra, a relatively even split was observed where 39% and 38.8% of thermal power plant workers in Dhanbad and Chatra respectively indicated an 8 to 10-hour working day.

Figure 23: Daily working hours of thermal power plant workers



The trend for unorganised workers also showcased relatively consistent working hours in a day. Most (55% on a base of 2000) unorganised workers worked for 4 to 8 hours a day. It can be seen from Figure 24 that a relatively even distribution of responses was observed in the districts of Dhanbad and Ranchi, wherein many (32.8% in Dhanbad and 34.3% in Ranchi) workers also reported working for 8 to 10 hours.

Figure 24: Daily working hours of unorganised coal sector workers

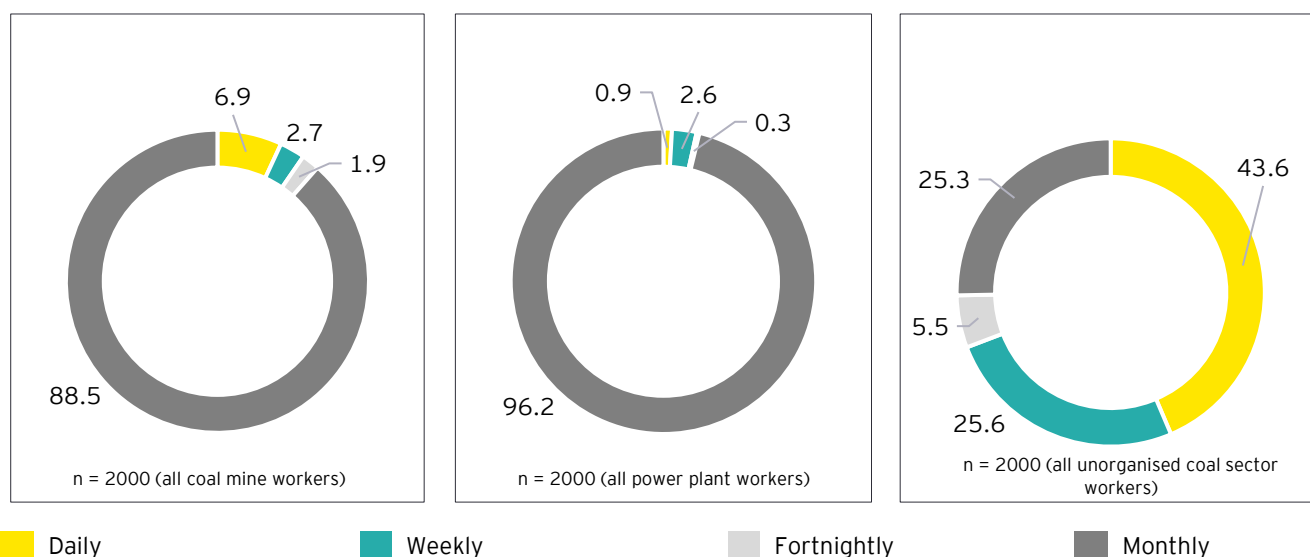


With regard to worker's remuneration, the **payment cycle was mostly consistent for organised coal sector workers** working in coal mines and thermal power plants, as they received their salary monthly; while the **trends differed for unorganised coal sector workers**, who received their wages mostly on a daily or weekly basis. Figure 25, Figure 26, and Figure 27 depict the differences in the frequency of remuneration among the three categories of coal sector workers interviewed in this research. While only 6.9% (on a base of 2000) coal mine workers and 0.9% (on a base of 2000) thermal power plant workers received their remuneration daily, this figure was found to be 43.6% (on a base of 2000) for unorganised coal sector workers. Similarly, the proportion of unorganised coal sector workers receiving their wages weekly was approximately 23 percentage points more than the organised coal mine and thermal power plant workers - this can be inferred from the graphs below, wherein the frequency of remuneration was reported to be weekly by 25.6% (base of 2000) unorganised coal sector workers and only 2.6% (base of 2000) organised power plant workers and 2.7 (base of 2000) organised coal mine workers

Figure 25: Frequency of remuneration among coal mine workers

Figure 26: Frequency of remuneration among thermal power plant workers

Figure 27: Frequency of remuneration among unorganised coal sector workers



Most workers (90.6%, on a base of 6000) indicated that they received their remuneration on time from their current employer. Among the workers who reported not receiving their wages on time usually (a total of 567 workers), the most prominent reasons for non-timely payment of wages included:

- ▶ Delay due to COVID-19 - 46% (base of 567)
- ▶ Refusal of remuneration by the employer - 42% (base of 567)



29%

(on a base of 567, who reported to not receive their wages on time usually)

workers expressed that delay in payment of wages is a usual pattern and an accepted norm in the coal sector

This section explored trends regarding the employment situation of both organised and unorganised workers in the five chosen districts. It reflected the patterns of the duration of employment of workers and daily working hours across all districts along with the remuneration trends of workers.

### 3.3 Health and well-being

Organised sector workers such as coal mine and thermal power plant workers explained that while there were some health and safety measures in place in their workplace, they were not widely available or entirely effective. **Issues relating to dust, lack of safety measures, etc. were shared by workers from all three categories: coal mine workers, thermal power plant workers, and unorganised coal workers.**

Illnesses due to dust and pollution, from both overground and underground mines, were the biggest challenge faced by coal mine workers in all districts. Furthermore, the lack of consistent safety measures that often lead to contact with toxic chemicals added to the health concerns of the workers. During the focus group discussions, coal mine workers also explained that a lack of regulation regarding daily working hours and mandated breaks has led to an unsafe working environment.

“

*The biggest problem here is dust and it isn't only limited to the mines. Our whole environment is polluted with dust. We are unable to do anything about the same since this is our place of work and our family also stays here. Hence, we have no option but to continue living in this environment. Many people are troubled by problems like cough and shortness of breath. Even those who do not have these problems currently are bound to develop some type of issues later if they keep working in the mines.*

Views expressed by men working in the organised coal sector in Bokaro

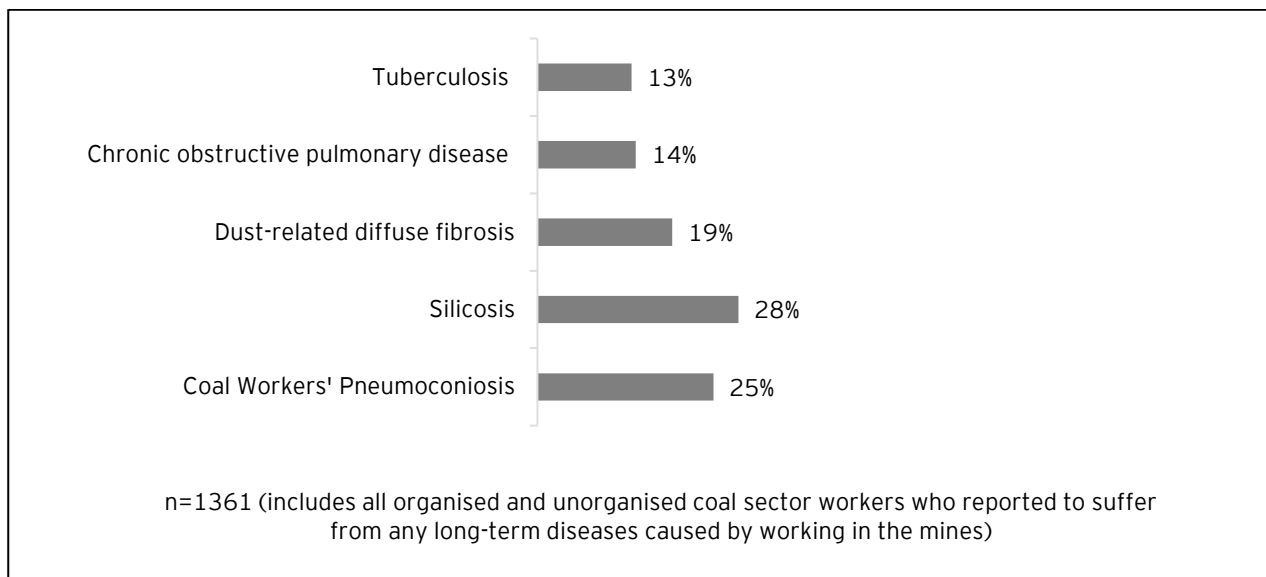
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Challenges around overall health and well-being highlighted by the organised workers showcase **the unsafe working conditions of the mines and thermal power plants, along with the lack of checks and balances regarding safety measures and working hours.**



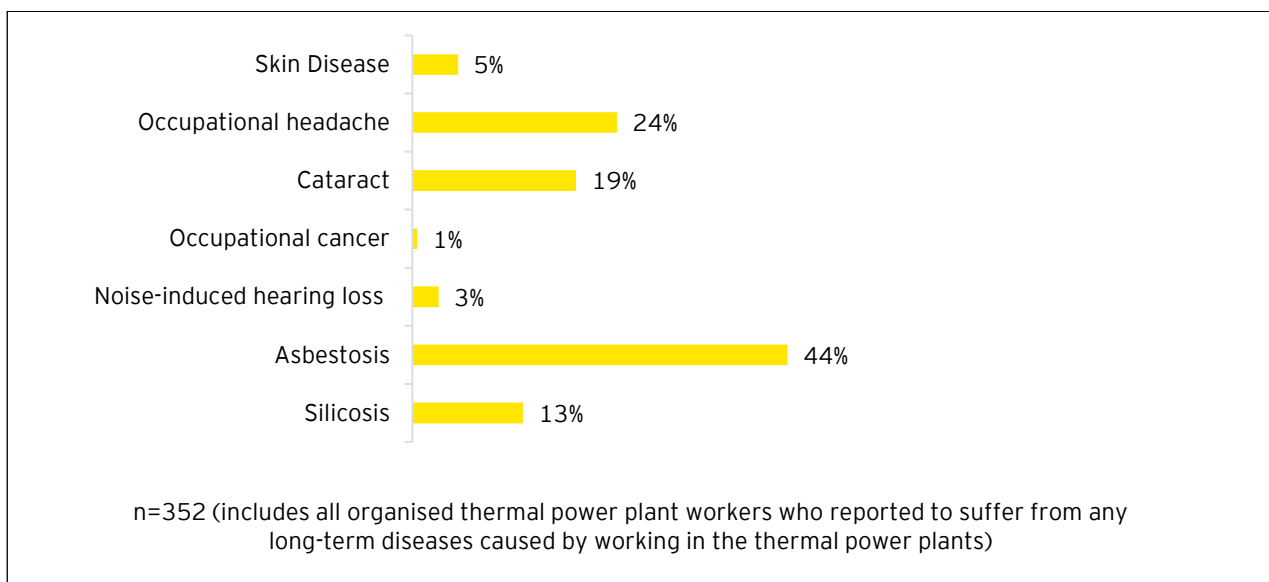
In terms of health issues, 34% (base of 4000) of **all organised and unorganised coal mine workers suffer from diseases caused by dust from coal mines**. It is evident from Figure 28 that 28% (base of 1361) of such workers suffered from silicosis and 25% (base of 1361) suffered from coal workers' pneumoconiosis.

Figure 28: Health issues faced by organised and unorganised coal mine workers owing to working in coal mines



With regard to thermal power plant workers, 18% (base of 2000) of them indicated similar concerns relating to their health and well-being at their place of employment. As observed in Figure 29, a **large number of thermal power plant workers suffered from asbestosis (44% on a base of 352) and occupational headaches (24% on a base of 352)**. The variety of health concerns that are highlighted in Figure 29 indicates that thermal power plant workers also have a hazardous and unsafe work environment.

Figure 29: Health issues faced by thermal power plant workers owing to working in thermal power plants



The claim that thermal power plant workers have an unsafe work environment was also corroborated by the responses from focus group discussions with thermal power plant workers across all four districts. It was observed that **most thermal power plant workers complained of a lack of safety equipment and high exposure to dust particles because of the construction work that they are involved in**. Thermal power plant workers also explained that **owing to the coal-based machinery and the proximity of coal mines around certain plants**, such as in Ramgarh, they had been facing some of the above-mentioned health concerns.

“

*We are employed in construction work on the thermal power plant campus and in the surrounding areas of the plant, which is spread across almost 8 to 10 kilometres. We work as labourers, and it is common for us to face health issues from working in this region. There are no provisions for medical health check-ups or healthcare facilities for us.*

Views expressed by women working in thermal power plants in Chatra

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In line with the concerns outlined above by coal mine workers and thermal power plant workers, **unorganised coal workers also voiced similar health and safety concerns regarding their employment**, during focus group discussions. Similar to the health concerns expressed by organised coal mine workers and thermal power plant workers, unorganised workers also indicated that exposure to dust caused respiratory illnesses, which was a major concern. Furthermore, the **biggest challenge that was highlighted by all unorganised workers was the complete lack of health and safety measures stemming from the informal nature of their employment.**

“

*Health is one of our major concerns. We work in the open coal mines, where there is a lot of dust on a regular basis. Due to the blasts in the mines, the dust spreads everywhere in the mines and in areas surrounding the mines. It even leads to cracks in the walls of our houses. Due to the dust, we are constantly suffering from a cough and cold. Further, treatments at hospitals are very costly for us and we don't have monetary savings as well.*

Views expressed by men working in the unorganised coal sector in Dhanbad

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# 4

## Demand, supply, and policy level findings





## 4 Demand, Supply, and Policy Level Findings

### 4.1 Coal demand and supply in Jharkhand

As explained in the above sections, coal is one of the major industries and employers in the state of Jharkhand. Thus, understandably, the coal industry is an important source of revenue for the state government. In 2019-20, CIL made a contribution worth INR 9,032 crores comprising of royalty cess, GST, and other levies, to Jharkhand - the highest among all other major coal-producing states in India.<sup>68</sup> Royalties from coal contributed to 23% of Jharkhand's total non-tax revenue in 2019-20 and 1.46% of GSDP in 2017-18.<sup>69</sup> Given the high dependence of the state on coal, it is important to consider the future demand and supply of coal in the state.

The current research on the coal industry in India and Jharkhand shows that coal production is unlikely to decrease in the coming years, where the **Ministry of Coal and the World Bank is estimating 56 larger open cast mines to meet the production target of 1 billion tons of coal by 2023-24.**

Source<sup>70</sup>

Interactions with stakeholder groups including the government, think tanks and mining companies provided a similar outlook via their opinion that coal demand and supply has not yet peaked, and thus, is likely to increase. These stakeholders **linked coal supply with the demand for electricity and energy in the state and the country.** The consensus is that as electricity demand is increasing around the country, so will the demand for coal, and accordingly, its supply will increase. Additionally, according to an internal document from the Power Ministry, **power plants in India that are dependent on imported coal have been directed to operate at maximum capacity through the utilisation of an emergency law.** This move comes in anticipation of an expected peak in power consumption during the summer, which is expected to break previous records.

Through the qualitative discussions, two aspects emerged with regard to the linkages between coal supply and electricity demand in Jharkhand. Firstly, the **majority of coal mined in Jharkhand is exported to thermal power plants outside of the state.** These mines are mostly operated by the subsidiaries of CIL, which then send the coal to their designated thermal power plants outside the state. Secondly, **owing to the high electricity demand, thermal power plants are continuing to be commissioned around the country.** India added eight power plants with a capacity of 4.49 GW in 2021-22 and has plans to commission an additional 7.01 GW in 2022-23.<sup>71</sup> Currently, there are 39 thermal power plants under construction in the country.<sup>72</sup> **Given these scenarios of demand for coal outside the state, coal supply is unlikely to decrease, at least in the short term.**

“

*Coal will reach a peak demand probably by 2024 and it is unlikely that demand will come down after that. The government's goal is to reach 1 billion tonnes in production by 2023-24. The government also has a target to achieve 100 million tonnes of coal gasification by 2030. In conjunction with this coal target, there are thermal power plants with a generation capacity of 36 GW in the pipeline. Sub-critical plants are getting decommissioned, but they are not reducing in number. Instead, they are getting replaced by supercritical plants. There are also plans to introduce ultra-supercritical plants. By 2030, 62 GW of thermal power plant generation capacity is planned to be added. So, along with coal, thermal power plants are not going away.*

Deputy Chief Engineer at a coal sector organisation

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<sup>68</sup> [https://www.teriin.org/sites/default/files/2021-06/Coal-Dependence-Need-Just-Transition\\_WP1.pdf](https://www.teriin.org/sites/default/files/2021-06/Coal-Dependence-Need-Just-Transition_WP1.pdf)

<sup>69</sup> [https://www.teriin.org/sites/default/files/2021-06/Coal-Dependence-Need-Just-Transition\\_WP1.pdf](https://www.teriin.org/sites/default/files/2021-06/Coal-Dependence-Need-Just-Transition_WP1.pdf)

<sup>70</sup> World Bank presentation to the Ministry of Coal for providing Support to Achieving a Just Transition in India's Coal Sector

<sup>71</sup> <https://www.spglobal.com/commodityinsights/en/market-insights/latest-news/coal/060322-india-expected-to-commission-10-thermal-coal-power-plants-in-2022-23-add-7010-mw>

<sup>72</sup> <https://www.spglobal.com/commodityinsights/en/market-insights/latest-news/coal/060322-india-expected-to-commission-10-thermal-coal-power-plants-in-2022-23-add-7010-mw>

Going forward, coal is likely to play an important role vis-à-vis electricity within the state as well due to the construction of the Patratu Super Thermal Power Plant in the Ramgarh district of the state. It is expected to have a generation capacity of 2,400 MW and around 85% of the power generated from it will be allocated to Jharkhand.<sup>73</sup> Despite being one of the largest producers of coal in the country, Jharkhand's power generation capacity remains low. Thus, **with the set-up of the Patratu Super Thermal Power Plant, the electricity generation capacity is going to more than double and account for the state's indigenous energy needs.** The full-fledged functioning of the plant will also increase employment in the power generation sector of the state, linking more people with the coal economy.

In addition to setting up thermal power plants, Jharkhand can also consider the possibility of solar power to meet its energy needs. The development of the solar sector in Jharkhand will be in line with the Jharkhand State Solar Policy that was released in 2022 and has been detailed in Section 4.4: Potential for Renewable Energy and Impact on Workforce.

“

*More than 80-90% of coal mined in Jharkhand by the subsidiaries of Coal India Limited (like CCL and BCCL) is sent to their associated power plants, which are located outside the state. In India, coal is not for the state, but for the nation. But now, with the construction of the Patratu Super Thermal Power Project, the power needs of Jharkhand will be met. Moreover, once the plant is operationalised, it will further build the coal economy of the state since it will encourage the sourcing and processing of coal locally.*

Official in Government of Jharkhand

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However, despite the coal demand increasing, there remain some **supply-side challenges in the state.** This primarily revolves around the challenge that many mines are not mechanised, which leads to inefficiency, especially with regard to transporting and moving coal in and around the mine. Another challenge deals with the profitability of some mines in Jharkhand. Once the reserves in the mines start to diminish, other processes such as washeries, sorting, and transportation, get costlier. This is because the operational cost of these activities remains the same, whereas the amount of coal used in them is reduced. Given these challenges, at times, it is difficult to meet the demand for coal, especially for power generation. Such challenges present an opportunity for exploring renewable energy options (like solar energy) in the state, given that the same is cheaper than coal.

Nonetheless, despite such challenges, certain stakeholders remain optimistic about the future of coal in the state.

“

*The future of coal mines in Jharkhand is bright. I expect mining to continue for the next few decades. Moreover, coal mining is a profitable activity as well. However, certain aspects affect profitability - this is mainly because of the reduction in coal extraction, due to which the cost of other activities in the value chain get expensive. Thus, when the extraction is reduced, mines tend to run at a loss.*

Coal Mine Manager at a coal sector organisation in Bokaro

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Thus, among various stakeholders, the view remains that coal demand is yet to peak and is unlikely to reduce. Coal is intrinsically linked with the energy sector in both, the country and the state, as it is a determining factor in the demand for coal. Given that electricity demand is also increasing, so will the production and supply of coal, even though the supply side in Jharkhand does face some challenges in terms of mechanisation and profitability. Since many stakeholders have such an outlook on the sector, the **question of a phase-down of coal tends to be irrelevant in the short term.** However, if India has

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<sup>73</sup> <https://energy.economictimes.indiatimes.com/news/power/pm-modi-inaugurates-ntpcs-rs-18000-crore-patratu-thermal-power-plant-in-jharkhand/64321640>

to meet its Net Zero goals by 2070, the eventual phase-down of coal is inevitable and requires planning for those dependent on the coal economy.

## 4.2 Perception of coal phase-down

Even though the present scenario on coal demand and supply suggests that it is not likely to go down soon, the **perception of an eventual coal phase-down can help preface the discourse around a 'just' transition in the state**. In this regard, **two schools of thought were observed with respect to potential coal phase-down, basis the diverging views of different stakeholder groups**. The first school of thought included most coal sector workers, sectoral experts, and policymakers; who denied the possibility of a coal phase-down even in the long term. The second school of thought encompassed a small proportion of coal sector workers and a few sectoral experts and policymakers, who were of the opinion that even though the usage of coal will be persistent in the future, it will eventually decrease and have a significant effect on workers.

Since the peak of coal is not imminent, two schools of thought emerged across stakeholder groups - with one denying the possibility of a coal phase-down and believing that action on a 'just' transition is not needed unless there is a drastic change in the coal landscape, and the other indicating that 'just' transition activities should be adopted regardless of the present and future situation of increase in coal production.

### Coal sector workers' perspective on coal phase-down

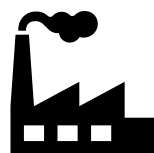
The backbone of the coal economy - comprising of **workers working in the organised and unorganised coal sector strongly denied possibilities of a potential coal phase-down**. The rationale behind this perception stems from their lifelong experiences of working on the ground, in various coal mines and thermal power plants - where they have witnessed abundant coal reserves and large-scale operational thermal power plants. Even in scenarios wherein some of the coal mines observed closures, workers reported having always found abundant employment opportunities in nearby coal mines. This was corroborated by the quantitative research findings, wherein a **majority of the coal sector workers were not aware of any coal mines and thermal power plant closures in their vicinity**.



59%

(on a base of 6000)

workers did not have any information about closure of coal mines in their vicinity



87%

(on a base of 6000)

workers did not have any information about closure of power plants in their vicinity

As compared to all five districts, **the district with the highest proportion of workers who had heard about coal mine and thermal power plant closures was observed to be Dhanbad**. This has been depicted in Figure 30 and Figure 31, where it can be observed that the district accounted for approximately 12% (base of 6000) and 4% (base of 6000) workers having information about coal mine and thermal power plant shutdowns, respectively. However, **knowledge of coal mine closures varies across different types of workers in the district**. Among all organised coal miners in Dhanbad, 71% (base of 400)



have heard of coal mines shutting down, as compared to only 53% (base of 400) of all unorganised coal workers in the district. This indicated that **organised coal sector workers are more aware of the developments in the sector than unorganised coal sector workers**. Hence, it can be inferred that **unorganised workers are likely to be more vulnerable to shocks in the sector as they do not have the requisite channels to stay informed and prepared**.

Figure 30: Coal sector workers who had information about the closure of coal mines in their vicinity

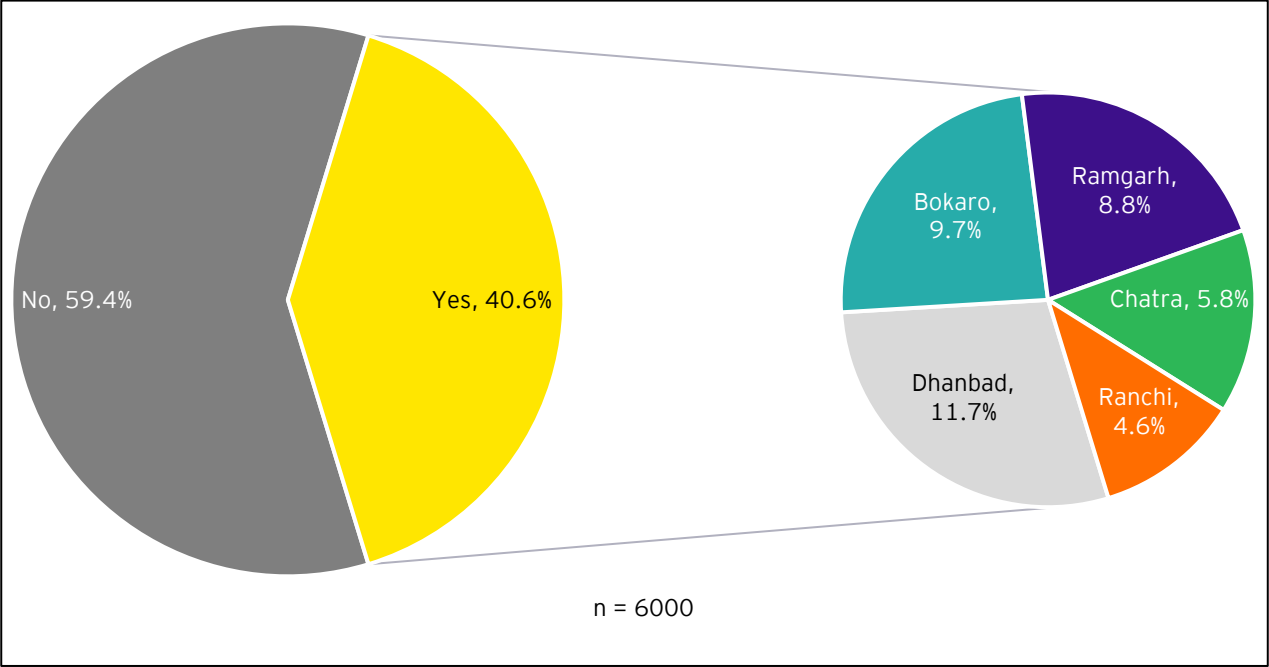
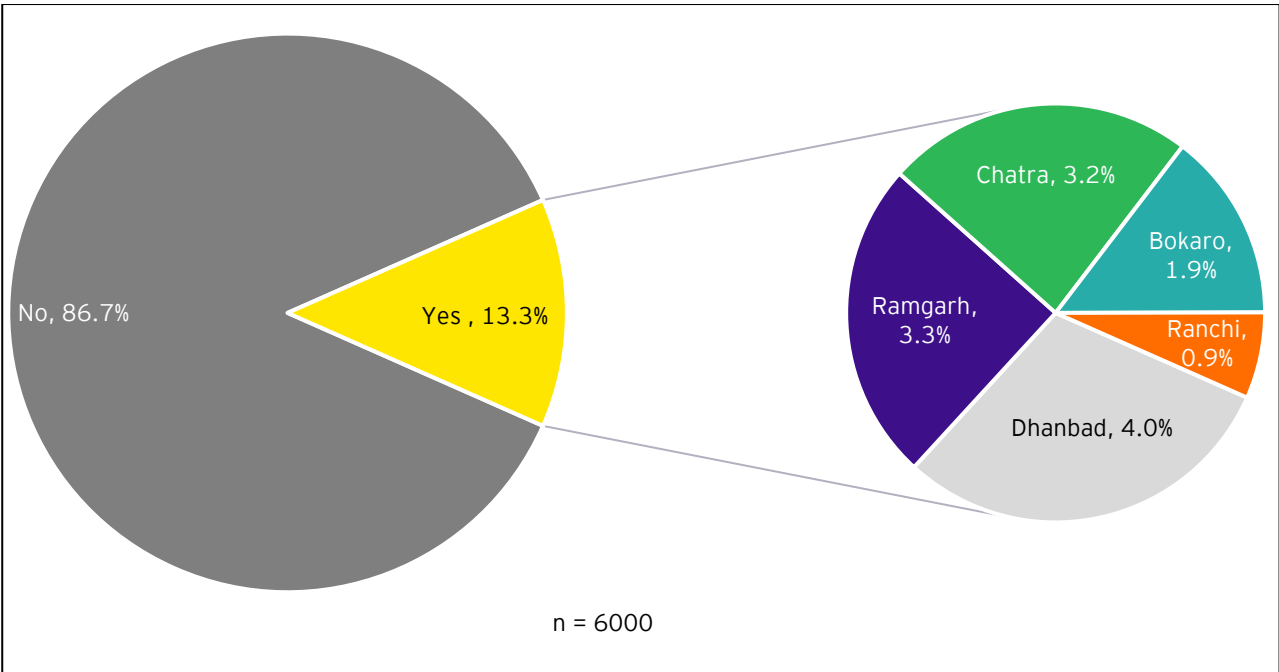


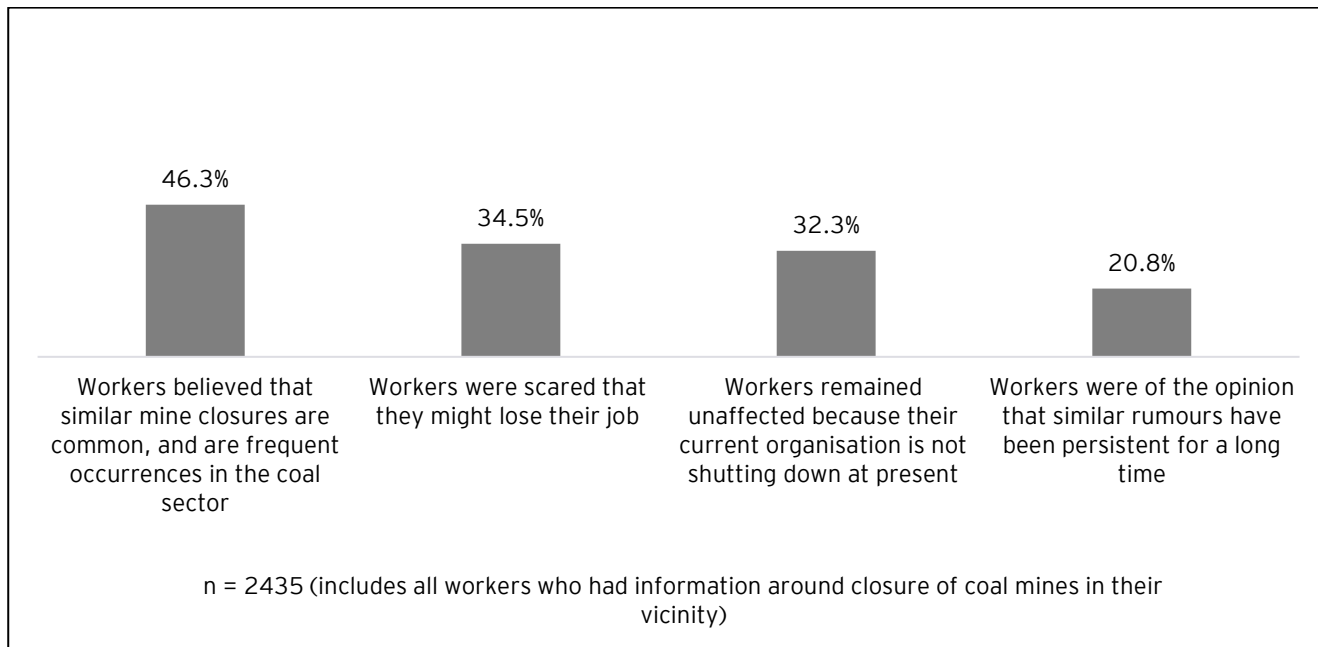
Figure 31: Coal sector workers who had information about the closure of thermal power plants in their vicinity



All workers (base of 2435) who had information about the closure of coal mines, displayed multiple viewpoints about the same. While 46% of such workers (base of 2435) believed that mine closures like these are usual in the coal sector and occur frequently, another 20% (base of 2435) of these workers believed that information around such mine closures is not true and perceived them to be rumours. It was also observed that a considerable proportion of workers, 32% (base of 2435), remained

unaffected because they were confident that their organisation or current employer is not shutting down at the present or in the near future. These viewpoints, illustrated in Figure 32, highlighted **the general sense on the ground, which points towards the inference that coal mine closures are usually not a cause of concern among the workers**. This stance was echoed by the workers in focus group discussions as well.

Figure 32: Workers' perception around coal mine closures in their vicinity



**Coal sector workers, across organised and unorganised domains, strongly denied possibilities of a potential coal phase-down.** Those who had information about coal mine closures did not find such incidents to be a cause of concern.

“

*We are aware that coal mines will close once the coal is extracted. The mines that have closed in the recent past have shut because of heavy extraction. But coal reserves are abundant in our region, and therefore, we do not get too worried when we hear such news about mine closures.*

Views expressed by women working in the unorganised coal sector in Ramgarh

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Although some workers do not consider mine closures to be a cause of concern, they highlighted **various reasons which would have potentially led to the closures of coal mines** during the focus group discussions. Most workers believed that over-mining and high extraction of coal, coupled with stringent Government and environmental regulations, lead to the

closure of coal mines. Specifically, unorganised coal sector workers in Ramgarh mentioned that illegal management and corruption also led to the closure of mines. Thus, the **government's plans to phase down coal were not observed to be an underlying factor that could potentially lead to the closure of mines by workers across all categories.**

As observed from Figure 32, **34% (base of 2435) of workers who reported having heard about coal mine closures, feared losing their livelihood owing to such closures** – which raises critical concerns regarding the stability of workers' employability. **The sense of fear was most pronounced among workers in Dhanbad (13.7%, base of 2435), as compared to all other districts.** Among all categories of workers, **coal mine workers working on a contractual basis strongly expressed concerns about their potential employability in other sectors in case of mine closures**, due to a lack of education, skills, and opportunities around the mines. Hence, an institutional and phase-wise roll-out of non-coal-based industries in Jharkhand may be explored to address the fears of community members. Examples of such industries include renewable energy, forest-based industries, and textiles among others. The introduction of such sectors will also spur the need to upskill and reskill workers for employment, which need to be supported through community mobilisation.

“

*It is difficult to imagine a scenario where coal mines shut down – it will lead to a lot of uncertainty in our lives. If mines are closed, then what will we do and where will we go? When we think about work, all that comes to our mind is mining. It will be a critical situation that will require a lot of thought because we don't have alternate employment opportunities available in our area. Additionally, we don't even have enough money to start our small businesses.*

Views expressed by men working in the organised coal sector in Bokaro

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**The effect of mine closures will be significant among workers, especially among women.** Mining as an industry helped women enter the workforce, as they were earlier restricted to forestry activities and household chores.<sup>74</sup> With an eventual coal phase down, in addition to a loss in their livelihood, women will also face more difficulties than men in migration in search of job opportunities, as they prefer to move as part of a pre-existing community.<sup>75</sup>

“

*With the closure of coal mines, it is likely that the men of the household will migrate, being the primary bread-earner of the families; and in most likelihood, the women will stay back. Since the women will be left behind in areas with few employment opportunities, they will end up in the drudgery of housework – being responsible for household chores and caregiving.*

Official in Government of Jharkhand

”

A difference in opinion was noted among unorganised coal sector workers and thermal power plant workers, who did not perceive the closure of mines and thermal power plants to be a cause of concern. Thermal power plant workers, especially in Ramgarh, were quite optimistic about their future employability given that the Patratu Super Thermal Power Plant is under construction in their district. On the other hand, some **unorganised coal sector workers in Dhanbad and Bokaro indicated their agility by highlighting their ability to pivot the situation and identify alternate sources of income.** Since such agility indicates workers' willingness to explore alternate livelihoods, it will be beneficial to direct them toward employment opportunities via a more structured and formal adoption process.

<sup>74</sup> [https://www.teriin.org/sites/default/files/2021-06/Coal-Dependence-Need-Just-Transition\\_WP1.pdf](https://www.teriin.org/sites/default/files/2021-06/Coal-Dependence-Need-Just-Transition_WP1.pdf)

<sup>75</sup> [https://www.teriin.org/sites/default/files/2021-06/Coal-Dependence-Need-Just-Transition\\_WP1.pdf](https://www.teriin.org/sites/default/files/2021-06/Coal-Dependence-Need-Just-Transition_WP1.pdf)

“

*Considering the construction of the Patratu Super Thermal power plant, we are certain that we will be employed there as workers. Since it has a large generation capacity, it is likely to operate for a long period and hence, it will present plenty of employment opportunities. We are looking forward to its opening in 2024-25.*

Views expressed by men working in thermal power plants in Ramgarh

”

Along with the above sentiments that stem from working in mines, other factors also play a role in helping form a perception among workers regarding a coal phase-down in Jharkhand. **Coal sector workers' awareness and knowledge of government and industry plans regarding the future of coal mines** are a few such factors.



# 14%

(on a base of 6000)

workers were aware of any government plans for reducing production of coal in the future

A very small proportion of all coal sector workers interviewed in this research had information on the government's plans for any potential coal phase-down in the future. This awareness was most pronounced in the district of Chatra, which accounted for 6.3% (base of 6000) of all such workers.

However, awareness levels differed across different types of workers. For all districts except Ramgarh, unorganised coal sector workers were found to have the least awareness as compared to organised coal sector workers in mines and thermal power plants. For

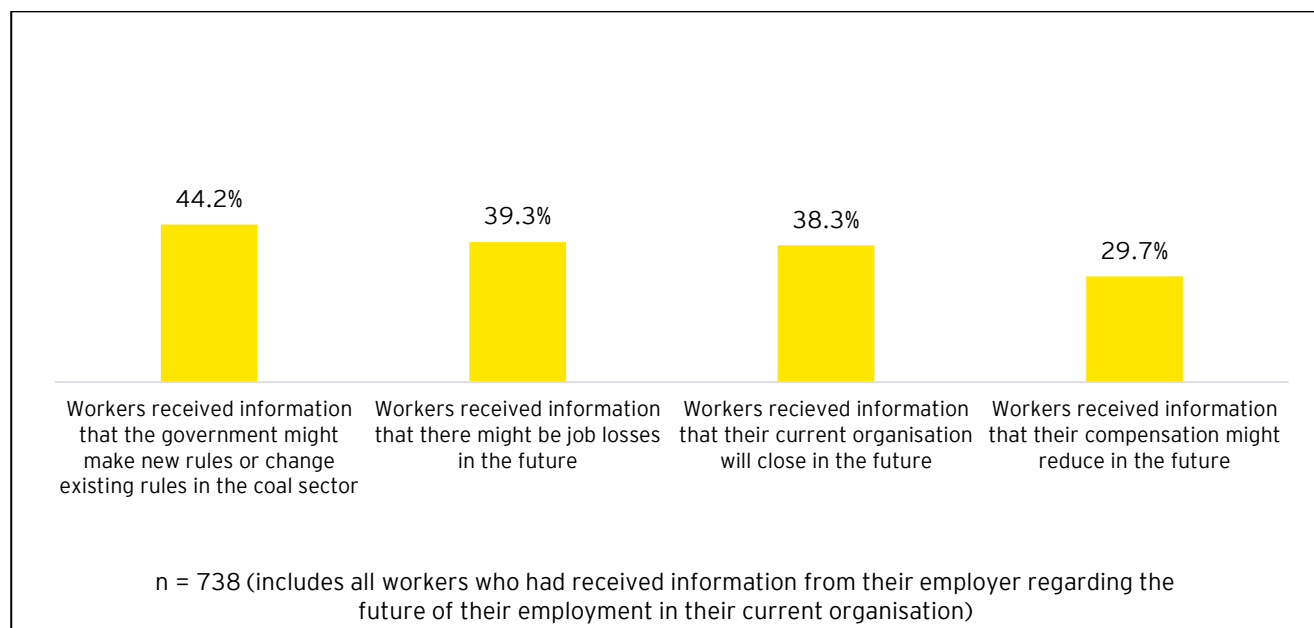
example, in Chatra, of all 376 workers who were aware of government plans around phase-down, 43% (base of 376) were thermal power plant workers, 36% (base of 376) were coal mine workers and only 21% (base of 376) were unorganised coal sector workers. This suggests that **there is a lack of access to information among unorganised coal sector workers.**

Since the level of awareness regarding government plans in the coal sector, was lesser among unorganised coal sectors workers, as compared to organised coal sector workers – **the unorganised coal sector workers are likely to be more vulnerable to shocks in the coal sector as they do not have the requisite channels to stay informed and prepared.**

Similarly, in terms of industry plans, only 12% (on a base of 6000) workers have received any information from their employer regarding the future of their employment in their current organisation. Of all the 738 workers who reported having received such information, the majority of workers (44%, base of 738) heard that the government is either going to make new rules or change the existing rules of the coal sector. This strongly highlights workers' perception that compared to the industry, it is **the government that is likely to play an important role in determining and shaping the coal sector in the state.** As illustrated in Figure 33, 39% and 38% (base of 738) workers received information about potential job losses and closures of mines in the future, respectively. These findings raise questions with regard to workers' livelihoods in the future.



Figure 33: Type of information received by workers from their employers regarding the future of their employment



#### ***Policymakers' and Sectoral Experts' perspective on coal phase-down***

As discussed in previous sections, **two schools of thought have emerged among the policymakers and sectoral experts** - wherein most stakeholders denied the possibility of a coal phase-down. These stakeholders were of the opinion that even if coal is not going to phase down in the short term, when it does, it will have significant repercussions with regard to the livelihoods of coal sector workers in the long term. The stakeholders in this school of thought represented a range of institutions, such as think tanks, trade unions, and state governments.

Stakeholders with the first school of thought also posited that **with the closure of coal mines, the earnings of workers can take a significant hit**. A phase-out of coal can have long-term unemployment effects and those who find jobs in alternate sectors might experience a fall of up to 30% in their earnings for at least 15 to 20 years.<sup>76</sup>

“

*There will be a huge problem immediately after the closure of coal mines, with unorganised coal sector workers getting affected the most. Since many workers will face losses in livelihood with a phase-down, it will not be possible to provide employment and account for all workers losing their jobs at the same time. Currently, coal mine workers earn decent compensation - ranging from INR 20,000 to 25,000 per month. With their levels of skills, no other industry in Jharkhand can provide them with employment opportunities having similar remuneration. With the closure of coal mines, the workers will have to be employed in multiple roles at the same time so that they get a similar return.*

Official in Government of Jharkhand

”

Another view highlighted by stakeholders was that the **coal phase-down will increase out-migration** as not enough employment opportunities available in Jharkhand. Moreover, since the **migration is likely to be distressed in nature**, it will have repercussions not only for Jharkhand but for the rest of the country as well, as workers will move to cities and urban centres in search of earning their livelihoods.

<sup>76</sup> [https://www.teriin.org/sites/default/files/2021-06/Coal-Dependence-Need-Just-Transition\\_WP1.pdf](https://www.teriin.org/sites/default/files/2021-06/Coal-Dependence-Need-Just-Transition_WP1.pdf)

“

*The impact of a coal phase-down is going to be very large; it could also result in law-and-order problems in mining areas, as a high level of agitation is expected from coal sector workers. Another inevitable effect is going to be migration, due to which it is likely that urban centres and cities are going to face a lot of stress. These places will need to develop the capacity to absorb the migrants that are likely to travel there in search of work. The effect of 'just' transition will spill into the cities.*

Leader of a trade union

”

Given the likely large-scale impact of coal mine closures, stakeholders in the second school of thought indicated the importance of planning for such a situation in the future, even if coal production in the country is expected to increase.

“

*After the coal production and demand peak, the coal sector workers will get impacted the most in terms of livelihood displacement. At this stage, a lot of work and planning needs our focus which can eventually help in mitigating and accounting for the post-peak effects in the long term.*

Chief Executive Officer at a think tank

”

As small and underground mines located in isolated pockets are on the verge of closure, **stakeholders in the second school of thought stressed upon the importance of planning for coal phase-down and closures of large mines during this time**, which are imperative in the future.

Nonetheless, the above views were found to be few among the diverse set of stakeholders interviewed in this research, whose opinions revolved around the denial of coal phase-down in the country, affirming their belief of the coal sector's likelihood to sustain the livelihoods of workers. It is also important to note that **most stakeholders part of this school of thought included government officials, which suggests that they are focused on the short-term scenario of increasing coal production in the country.** Inputs gathered from policymakers indicate that the plan does not necessarily involve phasing down coal; instead, it focuses on making coal extraction and usage more ecological and environment friendly along with working towards achieving net zero emissions. Government stakeholders at the state level also depicted similar views in terms of the increasing coal production in the state. However, **unlike the Central government's long-term coal phase-down and 'Just' transition aspirations, most government stakeholders at the state level did not consider such a scenario to be feasible at all.** Some stakeholders highlighted the increasing demand for coal is one of the main reasons why a coal phase-down is unlikely to take place.

“

*The number of coal mines is increasing in Jharkhand, which will surely facilitate an increase in employment prospects as well. Recently, the Ministry of Coal auctioned more than 20 mines in the state to private companies. Out of those, four have already been operationalised so far. For these mines, an additional workforce will be needed. And it's not just private companies that are participating in these auctions, some mines have even been auctioned to state PSUs of Punjab, West Bengal, and Uttar Pradesh. Jharkhand still has some good-quality coal reserves, so industry players are likely to continue maintaining their interests in the coal sector here.*

Official in Government of Jharkhand

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Given that the current supply of coal is unable to meet the demand, some stakeholders did not consider it opportune to go ahead with a phase-down at all. Along with the government, the **industry perception also denied the occurrence of a phase-down**. Additionally, the stakeholders interviewed also indicated that industry players take their cue from the government, which further suggests that the Government plays a critical role in deciding the future of the coal sector in India.

“

*I am not aware of a coal phase-down and neither have I received any information regarding this from any concerned authority or the government. As per my understanding, the government has plans to start new coal mines at many places in Jharkhand as there still are significant amounts of coal reserves available in the state.*

Coal Mine Manager at a coal sector organisation in Bokaro

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The perception of stakeholders involved in this research, including coal sector workers, policymakers, and sectoral experts, leaned towards a scenario with no phase-down of coal, at least in the short term. The majority of coal sector workers, from both the organised and unorganised sectors, believed that coal is not going to phase down due to their experience of working in mines, where they have come across sufficient reserves of coal. Similarly, Government policymakers and sectoral experts from think tanks also hinted towards a perspective that does not involve a phase-down of coal. **The stakeholders who indicated the possibility of a potential phase-down were found to be few.** Among the coal sector workers who had information about the closure of coal mines and thermal power plants in their vicinity, most did not view it as a cause for concern. Additionally, a small proportion of workers were aware of government and industry plans with regard to the coal sector and stressed upon the important role of the government in shaping the sector. Finally, few policymakers and sectoral experts who believed that there will be a coal phase down in the long term viewed it from a livelihood perspective where there will be significant employment losses along with other effects. These varying perceptions highlight that even while the share of coal generation will decline eventually, it will remain significantly high in the coming decade. Ultimately, Jharkhand will need to align its policies with the Centre to better avoid unnecessary socio-economic shocks to those intertwined with the coal sector. Moreover, since the government is a significant stakeholder in driving the coal sector ahead, its plan and interventions will play an important part to solve workers' alternate livelihood opportunities.

### 4.3 Adaptive Capacity and Financial Stability of Workers

The adaptive capacity of workers was observed to be heavily reliant on their transferable skills and their finances. The socio-economic profile of coal sector workers provided the necessary pretext needed to adequately understand and analyse the quantitative data regarding the adaptive capacity of workers.

55% workers (on a base of 6000) believed that they have the prerequisite skills required for getting employed in alternate sectors of their choice, which included food processing, agriculture, animal husbandry, horticulture, textile, construction, tourism, and others. However, discussions with organised and unorganised coal mine workers revealed that they do not think they have many (if any) transferable skills since they primarily work as unskilled labourers. From this deviation in responses, it can be inferred that though workers remained optimistic about pivoting to alternate industries in case of loss of livelihood, given their level of skills, they were apprehensive in terms of transferring their skill set to alternate sectors.



**35%**

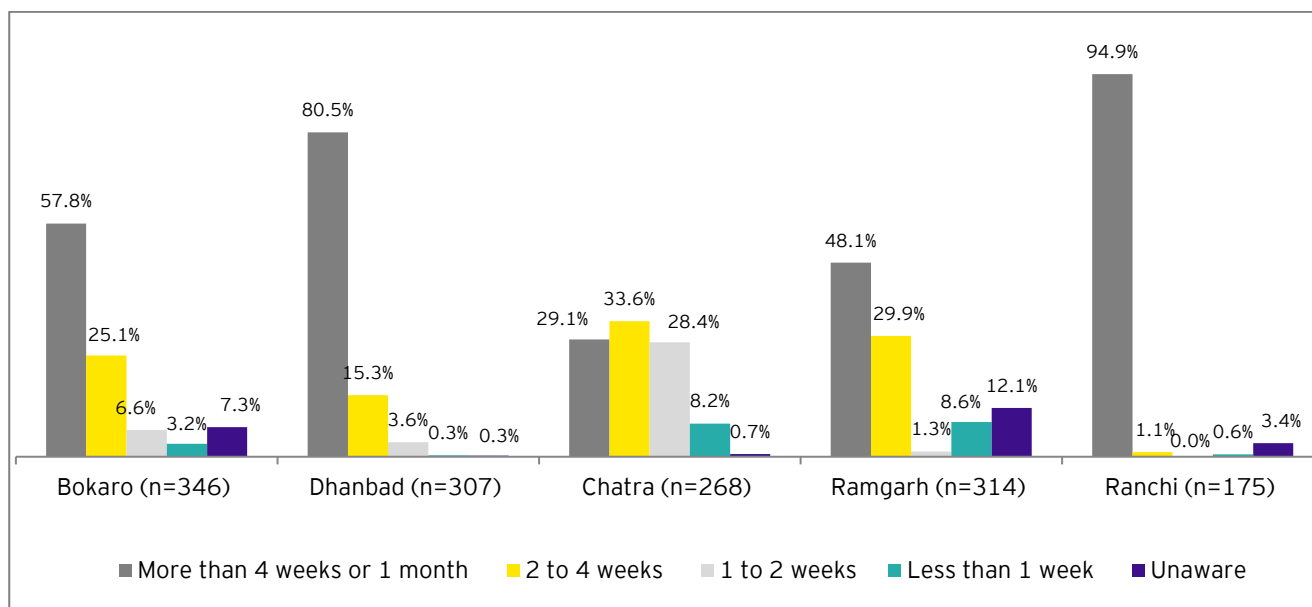
(on a base of 6000)

workers did not have any savings to provide a small buffer in the case of an immediate cessation of their current employment in the coal sector

Among the 1410 organised coal mine workers who reported having enough savings to sustain themselves and their family members in case of a potential job loss, it was observed that the majority (59.7%, on a base of 1410) of them had enough savings to sustain themselves for more than 4 weeks or a month. As shown in Figure 34, in all districts, except Chatra, most workers had savings that can run for more than 4 weeks. In Chatra, it was observed that the majority of workers (33.6%, on a base of 268) reported having savings that could sustain themselves for two to four weeks in case of loss of employment. These trends were supported by focus group discussions, which reflected a similar outlook among organised coal mine workers. However, it was through these focus group discussions that a more detailed view of the financial stability of coal mine workers was observed. It was seen that most coal mine workers had limited savings that would last for a maximum of a handful of months or were earmarked for other purposes. It was noted that women in Bokaro were particularly offended by the inquisition about their savings and were reluctant to share any information.

that would last for a maximum of a handful of months or were earmarked for other purposes. It was noted that women in Bokaro were particularly offended by the inquisition about their savings and were reluctant to share any information.

Figure 34: Duration for which coal mine workers' savings will last to sustain themselves before they find alternate employment



“

We have a small amount of savings, like various other households in the region. With the help of such savings, we can't sustain for more than three to five months. In case of mine closures, we will have to resort to coal extraction from the closed or abandoned mines.

Views expressed by men working in the organised coal sector in Ranchi

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As illustrated in Figure 35, an uneven split was observed amongst the responses of 1591 thermal power plant workers, with regard to the duration for which their savings will last to sustain themselves before they find alternate employment due to potential job loss. Most thermal power plant workers in Bokaro (55.5%, on a base of 528) and Chatra (38.2%, on a base of 330) reported that their savings would last them for about two to four weeks. On the other hand, the majority of workers in Dhanbad (52%, on a base of 327) and Ramgarh (54.4%, on a base of 406), reported that they had savings to last for more than 4 weeks or 1 month. The data represented in Figure 35 was aligned with the responses that were accumulated from the focus group discussions with thermal power plant workers across the four districts. It was observed that **most workers responded that they do not have enough savings to sustain themselves if they lose their current employment in thermal power plants**. A few workers even indicated that at the most they would be able to survive for a month. The majority of workers explained that they would immediately have to look for alternative sources of income. This sentiment was mirrored by the following quote from the workers that participated in the focus group discussions in Dhanbad.

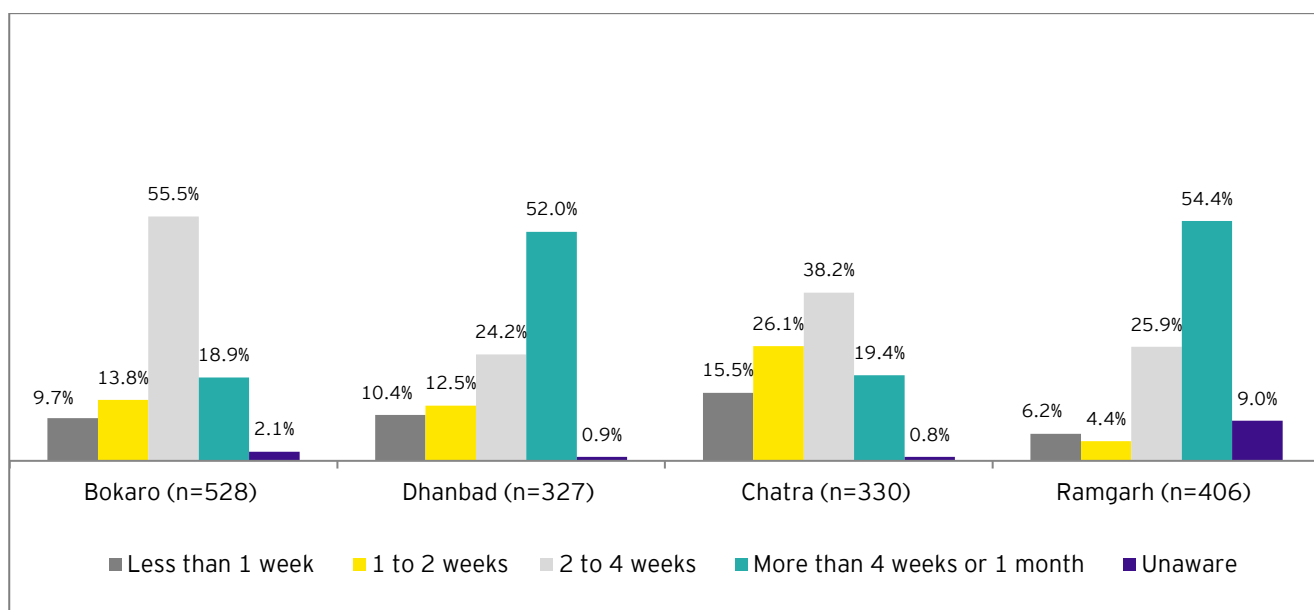
“

*We do not have a lot of savings in case our thermal power plant shuts down. With the limited savings that we have, we will not be able to sustain ourselves and our families for long. In case of plant closures, we will immediately have to look for alternate sources of income.*

Views expressed by men working in thermal power plants in Dhanbad

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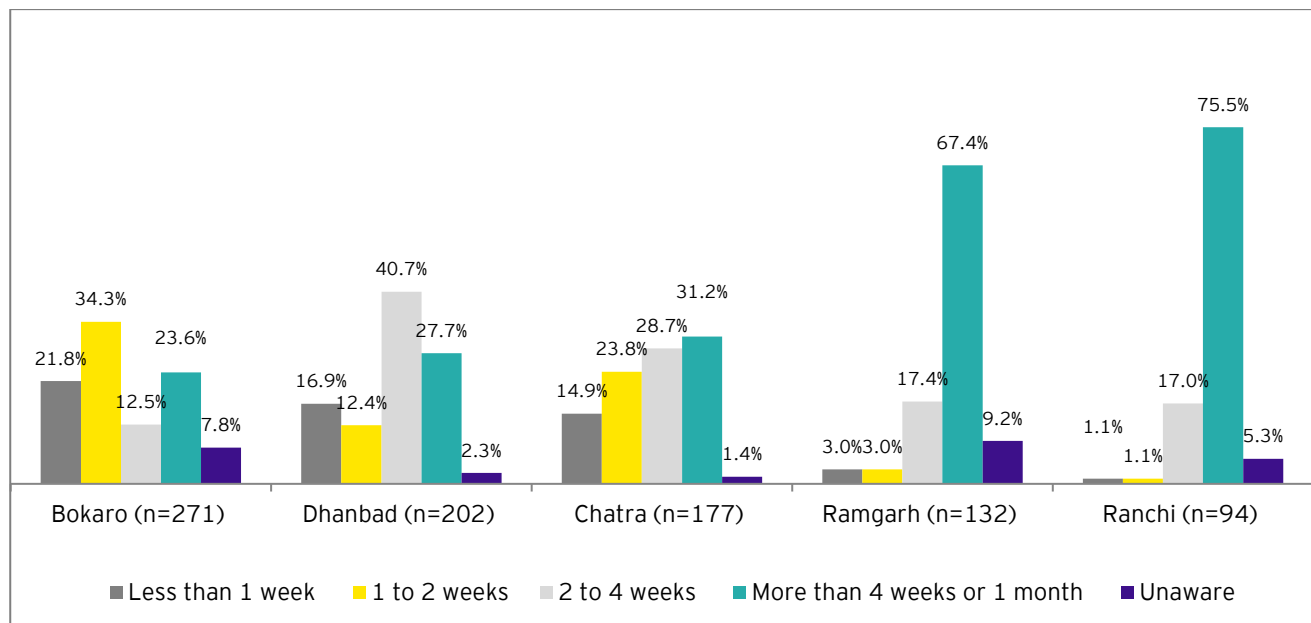
Figure 35: Duration for which thermal power plant workers' savings will last to sustain themselves before they find alternate employment



These perspectives and the corresponding data evidence, all form the basis of the argument that **there is a need for a plan in case of closures of mines and thermal power plants due to the torrential effect it would have on its surrounding micro-economy.**

Analysis of the **data on savings of 876 unorganised coal sector workers** in Figure 36 did not indicate any consistent trend - neither within the district (apart from Ramgarh and Ranchi), nor across all five districts. Unorganised coal sector workers of Ramgarh (67.4%, on a base of 132) and Ranchi (75.5%, on a base of 94) showcased a clear trend, wherein a majority of the workers explained that their savings would last them for more than 4 weeks or a month in case their current employment ceases. It is important to note, that this trend in Ramgarh and Ranchi differed from the responses captured in focus group discussions. Unorganised coal sector workers during the discussions exclaimed that they did not have any savings that could sustain them for long, before finding alternate employment.

Figure 36: Duration for which unorganised coal workers' savings will last to sustain themselves before they find alternate employment



Furthermore, unorganised coal sector workers also reported that their existing funds or savings were earmarked for emergencies. This perspective was portrayed through the following quote from the participants of a focus group discussion with unorganised coal sector workers in Bokaro. During the discussions with climate change think tanks, it was further reaffirmed that unorganised coal sector workers would have a harder time transitioning from this sector.

“

*In our daily lives, we are unable to save money. Whenever we have tried to save, the money is spent on treatment of health issues and repayment of loans. How can we save if we have limited income and high expenditures?*

Views expressed by women working in the unorganised coal sector in Bokaro

”

As the workers were apprehensive in terms of transferring their skill set to alternate sectors and further, they do not have enough savings to sustain themselves if they lose their current livelihood - **there is a need for action and support with regard to re-employment of all workers, organised and unorganised, within a month of any possible closures of coal mines and thermal power plants.**

## 4.4 Potential for Renewable Energy and impact on Workforce

Secondary research showed that the state of Jharkhand has the possibility of further expanding into renewable energy. It has been calculated that **Jharkhand's solar potential is 150 gigawatts (GW), which makes up almost 40% of India's current total power capacity<sup>77</sup>**. Establishing the solar power network, however, has its challenges. This was corroborated with views from stakeholders wherein they explained that while there is great potential for Jharkhand to expand into solar energy, there are some key challenges that need to be mitigated.

“

*There is great potential for renewable energy in the state of Jharkhand. However, there are a few challenges, such as - land acquisition, lack of manpower, and lack of investments. Given the rough and forest-covered terrain of Jharkhand, there is no free land for installing large-scale solar projects. Renewable energy requires skilled workers, which are hard to come by. There are very few solar power developers and investors, from both private and public companies.*

Official in Government of Jharkhand

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Currently, most investments are focused on other states such as Gujarat and Karnataka, due to the availability of land and grid infrastructure<sup>78</sup>. Not only are investments being diverted to other states on the Western belt of the country but there is also a **limited possibility of introducing more investments to Jharkhand** due to the state's distribution companies' financial distress<sup>79</sup>. However, it is imperative to note that studies have indicated that renewable source electricity is more cost-effective than coal-sourced electricity<sup>80</sup>. **Another challenge associated with renewable energy sources is job displacement.** Many jobs associated with the setting up and running of renewable energy plants are semi-skilled or skilled jobs. While the initial increase in jobs is expected to absorb some skilled coal sector workers, it has been noted, that the renewable energy sector does not have the capacity to absorb all displaced coal sector workers. Furthermore, the IEA explained that despite renewable energy's potential to create more upfront jobs through construction and manufacturing, it will still not require the same level of ongoing employment as coal mining or power plants<sup>81</sup>. This implies a **drop in employment opportunities** for those working in this sector, after the preliminary hike in employment opportunities.

During the interactions, it was observed that while some stakeholders have been pushing for large-scale solar projects, other stakeholders voiced polar-opposite views regarding the viability of renewable energy in Jharkhand (as indicated below).

“

*Currently, large-scale solar projects are attracting the maximum investments in the renewable energy sector, since solar is a proven business model. We have a good solar belt and a lot of wastelands, that is currently not generating any revenue. Since a large-scale renewable energy project does not generate many jobs, there are not many incentives to use coal mine lands for renewable energy projects.*

Director (Climate Policy) at a think tank

“

*Renewable energy will never replace coal as it is highly dependent on battery storage, especially for large-scale solar. Additionally, there are challenges associated with batteries as well since they are environmentally detrimental.*

Deputy Chief Engineer at a coal sector organisation

”

”

<sup>77</sup> [https://justtransitioninitiative.org/wp-content/uploads/2021/10/CoalDependentCommunities\\_Report.pdf](https://justtransitioninitiative.org/wp-content/uploads/2021/10/CoalDependentCommunities_Report.pdf)

<sup>78</sup> [https://justtransitioninitiative.org/wp-content/uploads/2021/10/CoalDependentCommunities\\_Report.pdf](https://justtransitioninitiative.org/wp-content/uploads/2021/10/CoalDependentCommunities_Report.pdf)

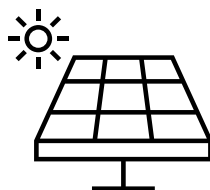
<sup>79</sup> [https://justtransitioninitiative.org/wp-content/uploads/2021/10/CoalDependentCommunities\\_Report.pdf](https://justtransitioninitiative.org/wp-content/uploads/2021/10/CoalDependentCommunities_Report.pdf)

<sup>80</sup> <https://www.iisd.org/system/files/publications/real-people-change-strategies-just-energy-transitions.pdf>

<sup>81</sup> <https://www.iisd.org/system/files/publications/real-people-change-strategies-just-energy-transitions.pdf>

The aforementioned perspectives from a range of stakeholders displayed the **uncertainty and the inconstant nature of renewable energy in Jharkhand**. These also reflected that renewable energy will not be a strong contender against coal in Jharkhand for a long time, given that it is still in its preliminary stages in the state. **While there is debate amongst stakeholders about whether renewable energy will be able to replace coal, there is a unanimous understanding that renewable energy is on the rise and there is great potential for it in Jharkhand.** With respect to the same, the State Government released the **Jharkhand State Solar Policy in 2022** which has an ambitious target of reaching **4,000 MW of solar power by 2026, almost doubling the previous target of 2,650 MW by 2020.**<sup>82</sup> Such a policy directive has the potential to meet the demand for Jharkhand's indigenous energy needs while also promoting employment in the solar energy sector.

Some coal sector workers indicated their inclination towards the renewable energy sector, wherein some of them reported being engaged in a training program that provides alternate skills for the renewable energy sector. It was observed that these workers believed that employment in renewable energy is the best way forward for them.



24%

(on a base of 331, who reported to be engaged in any training program that provides alternate skills for employment outside of coal sector)

workers were involved in attending trainings in the RE sector

However, **not all coal sector workers had a positive outlook on the future of renewable energy**, which was observed through the focus group discussions. Even though some workers were completely unaware of the potential for renewable energy, they shared their perception of the future of coal. The **unanimous response from all workers regarding the future of coal and a possible shift towards renewable energy** was that the coal industry will not diminish within the foreseeable future.

“

*Coal is the main source of employment in our area, and it provides livelihood opportunities to thousands of people. We are aware that there is a lot of coal in these regions, so it is not going to run out any time soon.*

Views expressed by men working in the unorganised coal sector in Dhanbad

”

**Many stakeholders were optimistic about the potential and future of renewable energy in Jharkhand.** While at its present state, renewable energy will gradually replace coal, secondary research shows that Jharkhand has a solar potential of 150 MW and indicates possibilities of further expanding into the renewable energy sector.

<sup>82</sup> <https://mercomindia.com/jharkhand-issues-new-solar-policy/>



## 4.5 Alternate Skilling and Employment Opportunities

The aforementioned sections lead to the exploration of alternate skilling programs and employment opportunities for coal sector workers, during a coal phase down; given that majority of the workers are not financially stable and would not be able to remain without employment for long periods. Since workers would have a lower adaptive capacity due to a lack of skilling, it is thus, imperative for skilling initiatives to be put in place. The need for alternate skilling was also substantiated by state-level Government officials.

“

*Currently, there are no skilling initiatives in the mining sector. The focus is on providing trainings in industries like apparel, management, and logistics. Generally, the trainings are attended by people within the age group of 18-35 years. While these trainings are open to anyone who wants to attend, they are aimed primarily at backward communities.*

Official in Government of Jharkhand

”

Secondary research demonstrated that there are a few possible sectors that coal sector workers would be able to transition to, in the state of Jharkhand. These include - agriculture, tourism, non-coal mining, forestry, and manufacturing<sup>83</sup>. For the organisations that are mining coal from Jharkhand, diversification is recommended into areas of renewable energy, which includes and is not limited to - solar power generation, solar photovoltaics (PV) manufacturing, and aluminium smelting, among others<sup>84</sup>. This would not only ensure the survival of the organisation but also maintain employment within the local regions.

The recommended alternate employment sectors bring with them their own set of challenges, which must be explored to truly gauge whether they form a viable employment option for coal sector workers or not. Within the agriculture and animal husbandry sector, it has been remarked that employment would be uncertain along with relatively lower wages, causing financial instability for the workers<sup>85</sup>. With regard to animal husbandry, there are challenges as well in terms of a decline in fishing due to water pollution from mines, and loss of land due to mines, rendering locals unable to maintain livestock<sup>86</sup>. Additionally, it is evident that the transition to sectors such as agriculture, tourism, manufacturing, etc. would require reskilling programs. It has been reported that attempts at reskilling have not been entirely successful. Studies have shown that approximately only 400,000 workers have been successfully reskilled annually through the programs made available by the government, out of which coal sector workers form a very limited number<sup>87</sup>.

Despite the challenges faced by other potential sectors of employment, studies have recommended that coal sector workers can be provided with skill training through two possible models. First, is the partner-led model, wherein workers are hired, trained, and then deployed, and this model is managed through the Services Operating Partner (MSOP) model<sup>88</sup>. The second model includes promoting entrepreneurship within workers through a franchisee-based service model. This model is supplemented with a last-mile delivery services-led entrepreneurship development model and a micro-business facilitation centre for start-ups<sup>89</sup>. Moreover, it is also recommended that economic development is aided by supporting the creation of MSMEs and providing support to regions by ensuring that there are adequate systems and infrastructures to allow for economic growth<sup>90</sup>. The responsibility of these initiatives would fall primarily on public sector entities due to the limited involvement and investment of private sector companies<sup>91</sup>. Encouraging private sector companies within the coal industry to take charge of these initiatives is recommended, since it is expected to support competition in the production of coal, thus, attracting investments, and generating employment and access to technology.

<sup>83</sup> [https://justtransitioninitiative.org/wp-content/uploads/2021/10/CoalDependentCommunities\\_Report.pdf](https://justtransitioninitiative.org/wp-content/uploads/2021/10/CoalDependentCommunities_Report.pdf)

<sup>84</sup> [https://justtransitioninitiative.org/wp-content/uploads/2021/10/CoalDependentCommunities\\_Report.pdf](https://justtransitioninitiative.org/wp-content/uploads/2021/10/CoalDependentCommunities_Report.pdf)

<sup>85</sup> [https://www.teriin.org/sites/default/files/2021-06/Coal-Dependence-Need-Just-Transition\\_WP1.pdf](https://www.teriin.org/sites/default/files/2021-06/Coal-Dependence-Need-Just-Transition_WP1.pdf)

<sup>86</sup> [https://www.teriin.org/sites/default/files/2021-06/Coal-Dependence-Need-Just-Transition\\_WP1.pdf](https://www.teriin.org/sites/default/files/2021-06/Coal-Dependence-Need-Just-Transition_WP1.pdf)

<sup>87</sup> [https://www.teriin.org/sites/default/files/2021-06/Coal-Dependence-Need-Just-Transition\\_WP1.pdf](https://www.teriin.org/sites/default/files/2021-06/Coal-Dependence-Need-Just-Transition_WP1.pdf)

<sup>88</sup> <https://ficci.in/spdocument/23589/studies.pdf>

<sup>89</sup> <https://ficci.in/spdocument/23589/studies.pdf>

<sup>90</sup> <https://ficci.in/spdocument/23589/studies.pdf>

<sup>91</sup> <https://ficci.in/spdocument/23589/studies.pdf>

Figure 37: Jharkhand Industrial and Investment Promotion Policy 2021



Source: [Jharkhand State News website](https://www.jharkhandnews.com/)

An example of such an approach can be seen through the Jharkhand Industrial and Investment Promotion Policy 2021 (Figure 37) which targets the generation of 5 lakh jobs, along with encouraging a multimillion-dollar investment pipeline, to improve access to technology and promoting skill-up gradation in areas such as engineering, apparels, cosmetic industry, agriculture and allied, etc.<sup>92</sup>

Further, the Ministry of Coal published its 5-year vision report (2019-24) indicating that the ministry would focus on providing employable skills to workers in the reclaimed areas of coal PSUs. This is envisaged to be done through conducting surveys to collate data regarding the needed areas of improvement and outsourcing to training agencies to follow through on infrastructure and system creation and implementation<sup>93</sup>.

Similar perspectives and recommendations in terms of alternate employment sectors were presented in the in-depth interviews with a variety of stakeholders, which included promoting livelihood-based activities such as - solar based power looms, solar drying and electrification of the rural health system and schools, and any other sector which might have the potential to generate enough jobs.

Other stakeholders indicated that there are not enough employment opportunities in Jharkhand, given that infrastructurally the state has been primarily set up as a mining state.

“

*The growth of new industries is not very promising in Jharkhand. Even after receiving skill training from the Department, many workers migrate outside of Jharkhand since there are very few jobs available in the state and they are restricted to a few sectors such as the apparel sector, beauty, and wellness. Migrating out of the state is not necessarily beneficial for the workers in monetary terms, owing to the high cost of living in other towns and cities.*

Official in Government of Jharkhand

”

This perspective is, however, countered by the opinions of other State Government officials, wherein they explained that there are a lot of opportunities within the state of Jharkhand to promote local employment.

“

*There are ample work opportunities available in Jharkhand. Since Jharkhand is a state rich in mineral reserves, there are opportunities for miners to work in other mines. Furthermore, along with the possibilities of working in other mines, coal sector workers can obtain employment working as electricians and technicians with some skill training.*

Official in Government of Jharkhand

”

<sup>92</sup> <https://ficci.in/spdocument/23589/studies.pdf>

<sup>93</sup> [https://coal.gov.in/sites/default/files/2021-01/vision\\_document.pdf](https://coal.gov.in/sites/default/files/2021-01/vision_document.pdf)

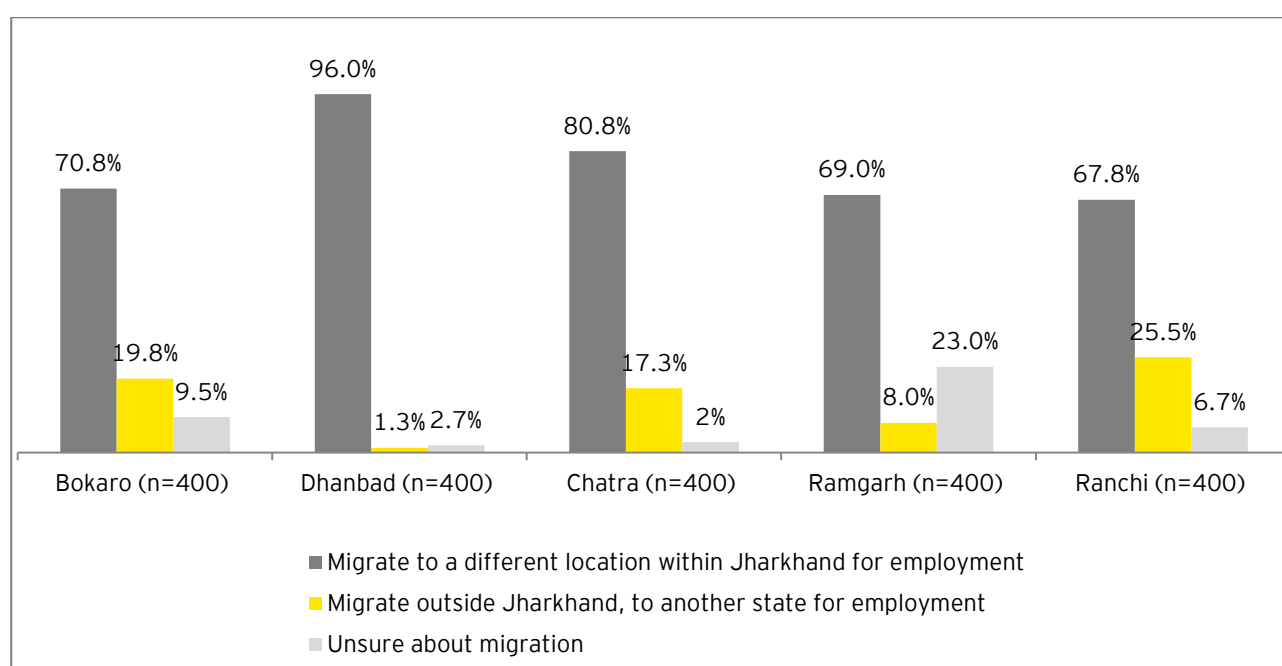
**Jharkhand is deeply entrenched as a mineral-rich mining state, and the generation of alternative livelihoods would be challenging.** The promotion of alternate livelihoods might not be nearly as effective as focusing on the expansion of mining of other minerals and reserves as a means to increase employment.

These opinions have also been supported by coal sector workers during the focus group discussions. **Organised coal mine workers and thermal power plant workers expressed that they would take up any employment that is available easily.** Some examples of employment included opportunities in the construction sector, service industry, and shifting to other mines. Many workers displayed apprehension towards the possibility of a coal phase-down due to their lack of skills, however, they were optimistic about their employment prospects. **Unorganised coal sector workers also mirrored similar perspectives, wherein they reported that there is no shortage of work in Jharkhand.** They explained that they too would take up work in sectors such as construction, transport, etc. **Workers in Ranchi and Dhanbad even indicated that with financial support from the government, they could procure motor vehicles (auto-rickshaws, etc.) and utilize the same for their employment.**

Responses from quantitative surveys were in line with the perspectives presented by workers during the qualitative interactions. Figure 38, Figure 39, and Figure 40 - all display the **willingness of organised coal mine workers, thermal power plant workers, and unorganised coal sector workers towards intra-state or inter-state migration in search of alternative livelihood options**, in case of their current place of employment closes down in future. A majority of 82% (base of 6,000) of workers indicated that they would prefer to migrate within Jharkhand for alternate employment in case their mine or plant shuts down. Around 8% (on a base of 6000) workers didn't have any opinion towards future migration and were unsure about the same.

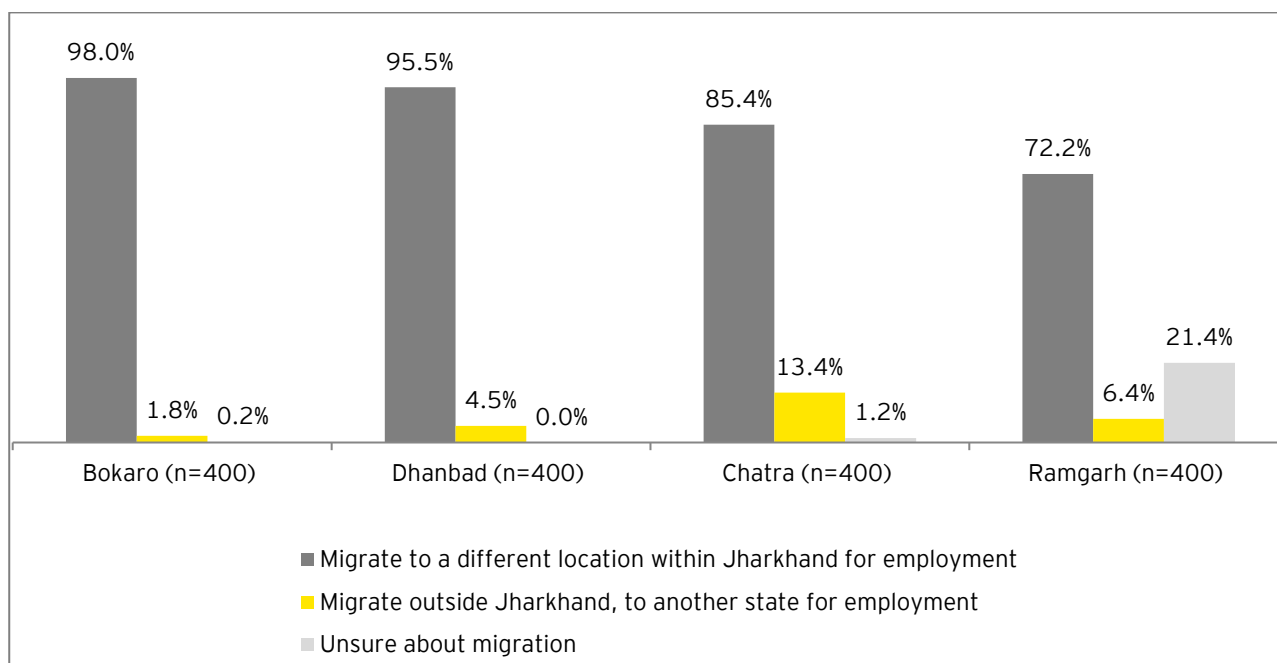
As indicated in Figure 38, a **majority (76.9%, on a base of 2000) of coal mine workers depicted their willingness to migrate within Jharkhand** in search of alternative livelihood opportunities, potentially looking to get employed in other coal mines present in nearby districts. Among all five districts, a **small proportion of coal mine workers wished to migrate outside of Jharkhand**, especially in Dhanbad, which accounted for the least percentage of coal mine workers (1.3%, on a base of 400) who wanted to migrate outside the state.

Figure 38: Willingness of organised coal mine workers to migrate, in case of mine closures



Similar to the trend displayed by coal mine workers, **most thermal power plant workers (87.9%, on a base of 2000) reported that they were willing to migrate to a different location within Jharkhand for employment in case their thermal power plant closes down in the future.** Figure 39 also indicated that Ramgarh accounted for the maximum proportion of thermal power plant workers (21.4%, on a base of 400) who did not have an opinion about migration.

Figure 39: Willingness of thermal power plant workers to migrate, in case of thermal power plant closures



As observed in Figure 40, **unorganised coal sector workers had similar opinions around migration, as showcased by coal mine and thermal power plant workers.** Most unorganised coal sector workers (81.3%, on a base of 2000) expressed that they would be willing to migrate to a different location within Jharkhand in search of alternate employment.

Figure 40: Willingness of unorganised coal sector workers to migrate, in case of mine closures

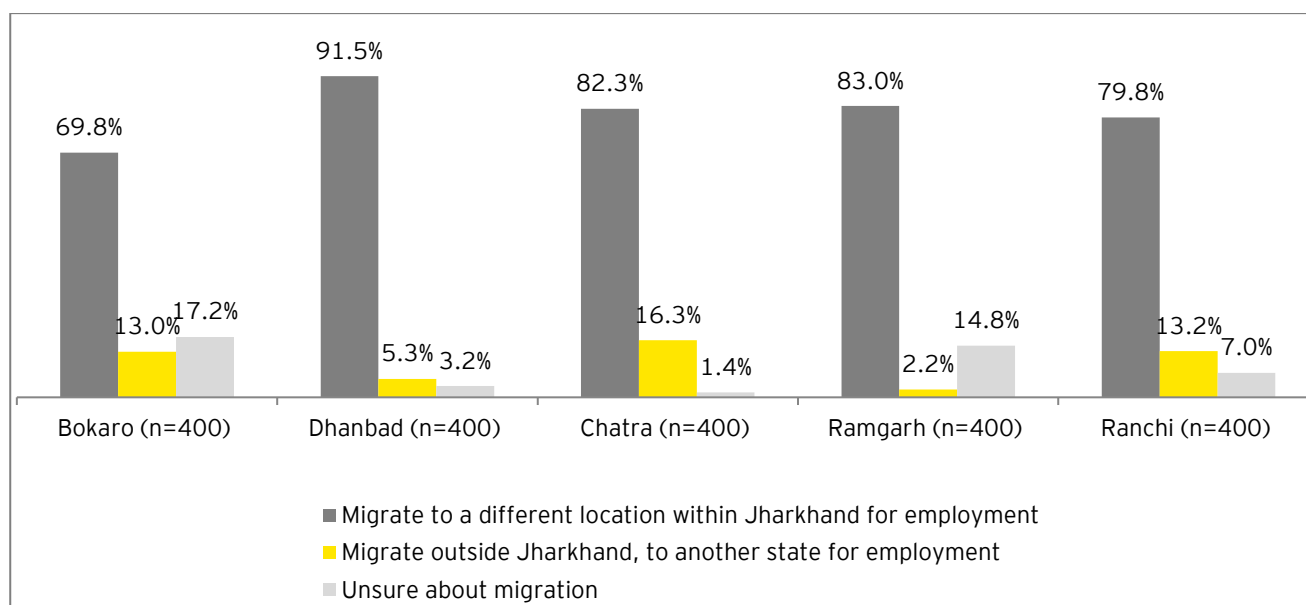
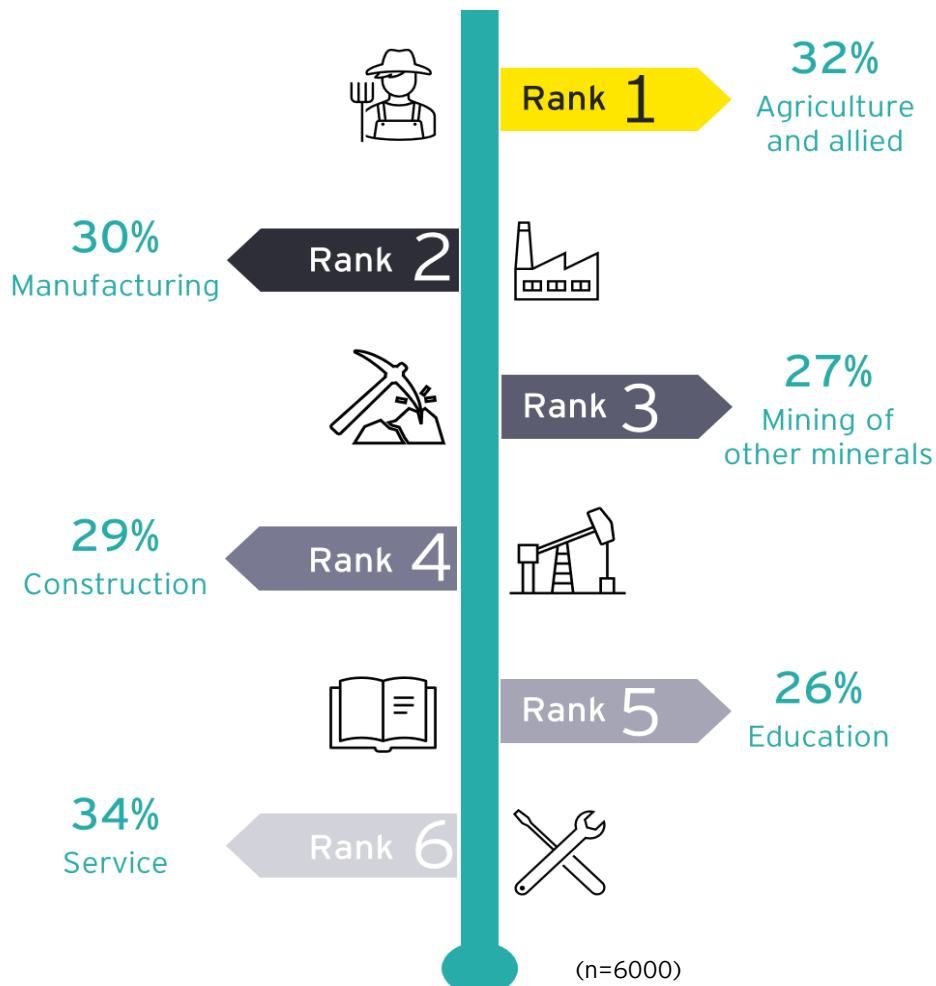




Figure 38, Figure 39 and Figure 40 illustrated above represent a cause of concern, as the **maximum proportion of coal sector workers across all three categories, preferred migrating within Jharkhand**. Such high levels of intra-state migration would **cause upheaval and displacement of workers and micro-economies within the state of Jharkhand**. Hence, there is a need to implement structured plans at the state and national levels, in order to mitigate probable mass migration in the best ways.

During the quantitative surveys, coal sector workers were provided with a choice to select from a list of six to seven alternate sectors for potential employment in case they lose their current source of livelihood. These included - agriculture and allied, manufacturing, mining of other minerals, construction, education, service (carpenter, electrician, plumber, etc.), and entrepreneurship. workers ranked the industries in the following order, as per their preference. The findings showcased that in terms of alternate livelihood sectors, agriculture was the most popular choice among coal sector workers, followed by manufacturing and mining of other minerals. However, 45% believed that they did have the requisite skills to work in their chosen sector for alternate employment. Nonetheless, given that their preferred sectors would not necessarily require a high level of skill set, it would be feasible for governments to encourage employment and training in them.



Findings have also depicted that 94% (on a base of 6000) coal sector workers reported not having participated in any training programs. However, a majority of the workers (85%, on a base of 6000) depicted a positive outlook and were willing to get engaged in skilling or reskilling programs, since they believed that participating in the same would facilitate their employment opportunities in the future.

**The focus on reskilling workers should take into account the workers' preferred alternate employment sectors** - which included sectors that do not necessarily require a high level of skillset (like agriculture, manufacturing, and others)

# 5

## **Learnings and Best Practices - International and National**



## 5 Learnings and Best Practices – International and National

### 5.1 Learnings from other geographies – International

In an effort to accurately analyse the concept of ‘Just’ Transition and a change within the coal industry, it is imperative to look at case studies of other geographies. This includes observation of their context relating to coal, their methods of phasing out coal, challenges faced, and any suggestions that can be applied to the Indian context.

#### 5.1.1 South Africa

The case of South Africa can be likened to the Indian context since South Africa is the 13<sup>th</sup> highest emitter of carbon dioxide (CO<sub>2</sub>) in the world, and it accounts for almost 1.2% of all cumulative carbon emissions<sup>94</sup>. This puts South Africa’s dependency on coal on similar levels as India, thus, providing a relatively equitable comparison. To reach their presented targets at COP26 of net zero by 2050, South Africa adopted many internal policies to curb their carbon emissions. A few examples of such policies include a Carbon Tax; an Integrated Resource Plan for the decommission of inefficient power plants along with the introduction of renewable energy sources; a Renewable Energy Independent Power Producer Procurement Program 2012 that allowed the private sector to participate in promoting renewable energy. Additionally, the internal policies were applied in conjunction with a ‘Just’ Energy Transition Partnership (JETP), which South Africa entered with the governments of France, the United Kingdom, Germany, the United States of America, and the European Union in 2021<sup>95</sup>. This partnership provides South Africa with aid worth \$8.5 billion (USD) to accelerate the phase-out of the usage of coal, by incentivizing clean energy through investments<sup>96</sup>. Additionally, the financial support included in the partnership encompasses any negative socio-economic effects due to the shift from coal. Based on the provisions of financial support from the JETP, South Africa revised its NDCs to include ambitious climate goals, such as reducing its 2030 target emissions range by 32%<sup>97</sup>. While this partnership deal provides a large financial aid package in terms of loans, grants, etc, it has been calculated that South Africa requires USD 27 billion to effectively continue with a Just Transition<sup>98</sup>. This imbalance is mitigated through strategic investments in the JETP financial aid package. The JETP outlines specific areas wherein the funding will be allocated in South Africa to ensure a Just Transition. This includes strengthening and expanding of transmission and distribution grid, decommissioning coal plants, accelerating renewable energy investments, energy efficiency measures, and laying a social infrastructure for stakeholders<sup>99</sup>. As of November 2022, South Africa still has to raise 44% of the projected funding needs for the Just Energy Transition Investment Plan for the initial five-year period. It is in the process of mobilising funding from sources including the International Partners Group (IPG), other countries, MDBs, DFIs, the private sector, philanthropies, and the government.<sup>100</sup>

#### 5.1.2 United States of America

As the country with the highest level of emissions, the case study of the US was particularly intriguing. At COP26, the US also pledged to achieve net zero by 2050. Aside from policies and initiatives that were focused on the overall aim of reducing carbon emissions as a whole, the US also introduced policies to ensure a just transition for the 100,000 workers<sup>101</sup> involved in the coal mining sector. This included the Partnerships for Opportunity and Workforce and Economic Revitalization (POWER) Initiative of 2015. The POWER initiative focused on providing funding to ensure the development of the economy and the workforce by supporting communities and regions negatively impacted by changes in the coal economy<sup>102</sup>. Furthermore, the US also introduced the Infrastructure Investment and Jobs Act 2021, wherein USD 21 billion was allocated for remediation. This included USD 11.3 billion to reclaim and redevelop land at unused mines and USD 4.7 billion to remediate abandoned oil and gas wells<sup>103</sup>. Additionally, funding was made available for local efforts for communities and regions that were the most impacted by the decline of coal production<sup>104</sup> through the Assistance to Coal Communities (ACC) 2017 initiative.

<sup>94</sup> <https://www.ucsusa.org/resources/each-countrys-share-co2-emissions>

<sup>95</sup> <https://ukcop26.org/12-month-update-on-progress-in-advancing-the-just-energy-transition-partnership-jetp/>

<sup>96</sup> <https://www.atlanticcouncil.org/blogs/energysource/the-just-energy-transition-partnership-with-south-africa-will-hinge-on-domestic-reform/>

<sup>97</sup> <https://www.atlanticcouncil.org/blogs/energysource/the-just-energy-transition-partnership-with-south-africa-will-hinge-on-domestic-reform/>

<sup>98</sup> <https://www.atlanticcouncil.org/blogs/energysource/the-just-energy-transition-partnership-with-south-africa-will-hinge-on-domestic-reform/>

<sup>99</sup> <https://ukcop26.org/12-month-update-on-progress-in-advancing-the-just-energy-transition-partnership-jetp/>

<sup>100</sup> South Africa’s Just Energy Transition Investment Plan (2023-2027), Presidential Climate Finance Task Team, The Presidency, Republic of South Africa, November 2022

<sup>101</sup> <https://www.csis.org/analysis/working-toward-just-transition-coal-communities>

<sup>102</sup> <https://sgp.fas.org/crs/misc/R46015.pdf>

<sup>103</sup> <https://www.csis.org/analysis/working-toward-just-transition-coal-communities>

<sup>104</sup> <https://www.eda.gov/coal/>



### 5.1.3 Germany

The case study of Germany also depicts the introduction of policies and initiatives to ensure a 'Just' Transition. As the country with the largest emissions within the European Union, Germany put forth goal targets individually as a country and as a part of the EU. One of the most pertinent target goals is to achieve climate neutrality by 2045, five years earlier than its previous 2050 net zero date.<sup>105</sup> Efforts to achieve this goal have been realized through 'Just' Transition policies such as the Coal Power Generation Termination Act 2020 which prohibits operating new coal-fired plants and lays out phase-out goals<sup>106</sup> for existing plants. To ensure adequate support was provided to communities hit the hardest by the phase-out of coal, Germany also introduced a Structural Strengthening Act 2020.

Analysis of existing literature demonstrates that ensuring a 'Just' Transition is one of the priorities of more and more countries looking to reduce their annual emissions by phasing down their coal consumption. Examples of this include Poland, Canada, and Ukraine.

### 5.1.4 Poland

To ensure a 'just' transition, Poland adopted a unique strategy wherein it included the workers through a Mining Social Package, which was introduced in 1998. This consisted of voluntary layoffs presented as an early retirement that was offered to a large group of miners providing high levels of financial support<sup>107</sup>. Including workers involved in mines allowed for a more efficient and effective transition toward a coal phase-down. Financial support acted as a social security net along with incentivization of workers to move towards early retirement. A one-time redundancy payment (commonly referred to as the "golden handshake"), welfare allowance, and retraining courses were provided to workers that chose to opt for early retirement<sup>108</sup>. It has been observed that by including trade unions and workers in the process of creating a framework for a coal phase-out<sup>109</sup>, Poland was able to transition seamlessly.<sup>110</sup> It was recommended that this unique approach to reducing/shifting employment from the mining sector to other sectors might be beneficial in countries with limited social assistance.

### 5.1.5 Canada

Canada's approach to a 'Just' Transition saw the launch of a task force for Canadian Coal Power Workers and Communities<sup>111</sup>. This task force included representation from all stakeholders, including workers, private sector companies, NGOs, academics, and government officials<sup>112</sup>, and focused on working with all stakeholders that would be impacted by a coal phaseout. Since there was a low reliance on coal energy, the task force aimed at predicting and mitigating the negative effects on workers and communities that were impacted by the transition<sup>113</sup>. This is done by including stakeholders' opinions and recommendations in any plans and strategies for mitigation. This approach once again involved the stakeholders to a large extent and allowed for a relatively seamless coal phase-down transition.

### 5.1.6 Ukraine

Ukraine has been moderately reliant on coal for its energy supply and aims to drop 12.5% of coal by 2035<sup>114</sup> from its total energy supply. This is projected to be done through the adoption of strategies that would restructure the coal sector by privatizing state-owned mines and decommissioning loss-making mines<sup>115</sup>. By implementing this approach, the government of Ukraine will be able to cease the provisions of subsidies, which would then allow for the repurposing of those funds towards ensuring that any negative impacts for coal workers and communities dependent on coal can be mitigated. The government has been developing plans to provide social and environmental support for each coal mine that will be closed along with rehabilitation plans for that region<sup>116</sup>.

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<sup>105</sup> <https://www.bundesregierung.de/breg-de/themen/klimaschutz/climate-change-act-2021-1913970>

<sup>106</sup> <https://www.loc.gov/item/global-legal-monitor/2020-08-31/germany-law-on-phasing-out-coal-powered-energy-by-2038-enters-into-force/#:~:text=The%20Coal%20Phase%20Out%20Act,start%20operating%20after%20August%2014%2C>

<sup>107</sup> <https://www.iisd.org/system/files/publications/real-people-change-strategies-just-energy-transitions.pdf>

<sup>108</sup> <https://www.iisd.org/system/files/publications/real-people-change-strategies-just-energy-transitions.pdf>

<sup>109</sup> <https://www.iisd.org/system/files/publications/real-people-change-strategies-just-energy-transitions.pdf>

<sup>110</sup> <https://www.iisd.org/system/files/publications/real-people-change-strategies-just-energy-transitions.pdf>

<sup>111</sup> <https://www.iisd.org/system/files/publications/real-people-change-strategies-just-energy-transitions.pdf>

<sup>112</sup> <https://www.iisd.org/system/files/publications/real-people-change-strategies-just-energy-transitions.pdf>

<sup>113</sup> <https://www.iisd.org/system/files/publications/real-people-change-strategies-just-energy-transitions.pdf>

<sup>114</sup> <https://www.iisd.org/system/files/publications/real-people-change-strategies-just-energy-transitions.pdf>


<sup>115</sup> <https://www.iisd.org/system/files/publications/real-people-change-strategies-just-energy-transitions.pdf>

<sup>116</sup> <https://www.iisd.org/system/files/publications/real-people-change-strategies-just-energy-transitions.pdf>



### 5.1.7 Indonesia

The governments part of the IPG including Japan, the United States, the European Union, Canada, Denmark, France, Germany, Italy, Norway, United Kingdom announced a JETP with Indonesia in November 2022<sup>117</sup>. This JETP will provide Indonesia with USD 20 billion over the course of three to five years to ensure a just transition in Indonesia<sup>118</sup>. It is expected that USD 10 billion will be mobilized by IPG members, through public financing, while the rest of the \$10 billion will be private finance mobilized by the Glasgow Financial Alliance for Net Zero Working Group<sup>119</sup>.



All countries examined the best possible way to mitigate social unrest for the workers and within communities that were most impacted by the phase-down of coal. In almost all cases this included **a reskilling program, funding to ensure that the micro economy of such communities was kept running, along with provisions of some form of social assistance.**

As can be seen through the aforementioned case studies of different countries, there are a variety of approaches that can be implemented to ensure a 'just' transition approach leading from a coal phase down. However, upon closer analysis, it is evident that each country accounted for a few necessary initiatives and approaches. These measures were, of course, tailored to suit the context and needs of individual countries, however, each country inevitably attempted to ensure that assistance to workers, funding to maintain the micro-economies, and cost-efficient strategies for phasing out coal power plants and mines through rehabilitation were implemented. The recent JETPs with South Africa and Indonesia have led to discussions around a JETP with India. It has been observed that the financial terms of a JETP with South Africa and Indonesia have been a contentious issue, which is a concern for India as well<sup>120</sup>. Most recipient countries prefer financial aid in the form of grants, while most donor countries prefer to provide aid in the form of loans, as has been the case with the specifics of the South Africa JETP. Additionally, many scholars have presented the opinion that for India a JETP will not be conducive if it will not take into account India's specific country context, which includes a large number of unorganised workers. Unless the terms of a JETP are contextualized for India, there is a possibility that these unorganised workers will remain unaccounted for during a just transition.

<sup>117</sup> <https://www.whitehouse.gov/wp-content/uploads/2022/11/Joint-Statement.pdf>

<sup>118</sup> <https://www.gov.uk/government/news/indonesia-just-energy-transition-partnership-launched-at-g20#:~:text=The%20new%20Indonesia%20Just%20Energy,%241%20billion%20World%20Bank%20guarantee.>

<sup>119</sup> <https://www.gov.uk/government/news/indonesia-just-energy-transition-partnership-launched-at-g20#:~:text=The%20new%20Indonesia%20Just%20Energy,%241%20billion%20World%20Bank%20guarantee.>

<sup>120</sup> <https://www.csis.org/analysis/g7-and-indian-just-energy-transition-partnership-roadmap>

## 5.2 Learnings from Giridih District, Jharkhand – National

### 5.2.1 Background and context

It has been estimated that mining began in the Giridih coal fields in 1871, making it one of the oldest coalfields that have been operational in India<sup>121</sup>. Over the years, the coal mines in Giridih have been managed by different statutory bodies and organisations. While at its inception in the 1890s, the coal mines in Giridih were managed by the East India Railway (EIR) Colliery Department; at present CIL's subsidiary - CCL manages the same. Figure 41, captured from CCL's project office in Giridih, indicates the list of personnel from various organisations, who were involved in managing the mines over the years.

At present, there are two open-cast coal mine projects in the district of Giridih which are being managed by CCL and were non-operational at present; namely, Giridih Open Cast Project (OCP) and Kabribad OCP. While operations of the Giridih OCP mine were halted in the last two to three years, Kabribad OCP became non-operational in January 2022. Approximately 700 direct workers are employed by CCL in the Kabribad OCP, of which 9% were reported to be women.

Giridih OCP had been closed owing to the high costs of coal extraction, leading to low profitability. CCL personnel estimated that coal could potentially be extracted from this mine for two years, but the costs of the same will rise exponentially.

Interactions with the Government officials and CCL personnel indicated that owing to changes in Government regulations, it was critical for CCL to re-apply and obtain Environmental Clearance (EC) for operating the Kabribad mine at its optimal coal generation capacity. At present, CCL has been actively involved in applying for EC to operationalize the open cast mine at the earliest.

Smoke emanating from Kabribad coal mines (as observed in Figure 42) has deteriorated air quality in and around the core mining area, further leading to environmental degradation. The Environment Officer (EO) of CCL believed that the combustion was accelerated due to the temporary closure of mining activities in the Kabribad OCP.

Figure 41: List of personnel involved in managing Giridih coal mines since the inception

E.I.R. COLLIERY DEPARTMENT	
GIRIDIH	
COLLIERY SUPERINTENDENTS	
AREA GENERAL MANAGERS	
GENERAL MANAGERS	
NAME	PERIOD FROM TO
DR. W. SAISE, D. SC.	1.1.1896 – 30.4.1905
MR. T. H. WARD, M.I.C.E., F.G.S., M.I.M.E.	1.5.1905 – 2.4.1915
MR. G. C. LATHBURY, M.I.M.E.	1.5.1915 – 30.9.1919
MR. A. WRIGHT, M.I.M.E.	1.10.1919 – 30.6.1920
MR. G. C. LATHBURY, M.I.M.E.	1.7.1920 – 30.4.1921
MR. J. H. FULLWOOD, M.I.M.E.	1.5.1921 – 30.6.1922
MR. H. LANCASTER, M.I.M.E.	1.7.1922 – 12.11.1931
MR. J. BROWN, M.I.M.E.	13.9.1931 – 12.9.1932
MR. H. LANCASTER, M.I.M.E.	13.9.1932 – 31.3.1936
:- STATE RAILWAYS COAL DEPARTMENT :-	
MR. H. LANCASTER, M.I.M.E.	1.4.1936 – 30.6.1938
MR. A. ORR, M.I.M.E.	1.7.1938 – 20.7.1938
MR. W. A. SPRAY, E.D., M.I.M.E.	21.7.1938 – 5.6.1945
MR. W. T. STANTON, M.I.M.E.	6.6.1945 – 20.6.1945
MR. W. A. SPRAY, E.D., M.I.M.E.	21.6.1945 – 28.2.1946
MR. H. J. B. RAYNOLDS, OBE, M.I.M.E.	7.3.1946 – 10.4.1947
MR. L. S. CORBETT, B. ENG., M.I.M.E.	11.4.1947 – 24.1.1949
SRI. A. B. GUHA, B. SC. (BHAM)	25.1.1949 – 3.7.1950
SRI. D. R. BAGROY, A. I. S. M.	4.7.1950 – 17.8.1955
SRI. B. L. DHRI, A. I. S. M.	18.8.1955 – 30.9.1956
:- N. C. D. C. LIMITED :-	
SRI. B. L. DHRI, A. I. S. M.	1.10.1956 – 23.2.1960
V. A. C. A. N. T.	24.2.1960 – 17.4.1961
SRI. K. RAI, B. SC. (LEEDS) A. I. S. M.	18.4.1961 – 15.10.1964
SRI. S. YEGNESWARARAN, B. SC. MINING	16.10.1964 – 24.2.1966
SRI. S. K. MUKHERJEE, A. I. S. M.	25.2.1966 – 22.6.1968
SRI. J. M. DHAWAN, A. I. S. M.	28.6.1968 – 28.2.1969
:- N. C. D. C. LTD. C. I. :-	
SRI. S. K. BOSE, A. I. S. M.	1.3.1969 – 23.6.1969
SRI. R. G. MAHENDRU, A. I. S. M.	24.6.1969 – 5.12.1971
SRI. U. S. P. SINHA, A. I. S. M.	6.12.1971 – 30.4.1973
:- N. C. D. C. LIMITED HEADQUARTERS :-	
SRI. J. M. DHAWAN, A. I. S. M.	1.5.1973 – 10.6.1973
:- N. C. D. C. LIMITED B & K :-	
SRI. U. K. RAJA RAO, A. I. S. M.	11.6.1973 – 31.10.1975

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*Our Kabribad open-cast mine was operational till December 2021 and then we had to temporarily halt the operations in January 2022. We are in the process of getting the Environment Clearance from the Pollution Control Board, which typically is a 180 days-process. As we are unable to extract coal, we are not only facing monetary losses due to it, but it's also leading to environmental degradation because of the smoke emanating due to combustion.*

Environment Officer at a coal sector organisation in Giridih

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<sup>121</sup>[https://en.wikipedia.org/wiki/Giridih\\_Coalfield#:~:text=Coal%20mining%20activities%20were%20initiated,started%20organised%20mining%20in%201896.](https://en.wikipedia.org/wiki/Giridih_Coalfield#:~:text=Coal%20mining%20activities%20were%20initiated,started%20organised%20mining%20in%201896.)

Figure 42: Kabribad open cast project of CCL in Giridih district



### 5.2.2 Impact on coal sector workers in Giridih

Most mines in the country, including the Giridih OCP, are closed when the resource is depleted or exhausted, or mining is no longer economically profitable. Non-operationalization of Giridih OCP even raised various concerns among the communities, but since the closed mines were still under caretaking and maintenance by CCL, workers were of the view that the mines will reopen, and mining activities will resume soon. Interactions with coal sector workers, both direct and indirect, clarified that the impact of mine closure on workers varied according to their employment type.

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*When the closures of the first mine project of CCL was announced, the community members were scared. There was a sense of fear and uncertainty among them as to what will happen next. Most people wished and were hoping that the mines would be operational soon such that they don't lose their livelihoods for long.*

Official (Giridih) in Government of Jharkhand

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#### **Impact of mine closure on workers varied according to their employment type.**

Daily wage contractual workers employed by private organisations (engaged by CCL) experienced large blows on their income, and at present, they have not been to source stable alternate employment opportunities.

Among permanent workers of CCL, most semi-skilled workers previously employed at the units for technical roles (such as blasting, etc.) were **shifted to other mines operated by CCL, in nearby districts like Bokaro**. This was corroborated and validated during the interactions with CCL Project Officer. Additionally, a minimal workforce comprising permanent employees was retained by CCL at the two projects (Giridih OCP and Kabribad OCP) for the **upkeep and maintenance of the mines**. This was done to prevent illegal coal picking and encroachment by animals, until further notice and receipt of EC. The Project Officer at Kabribad OCP stated that **CCL has been paying full salary to its employees working in the Kabribad coal mine during its temporary closure**.

Private organisations which were engaged by CCL to source contractual workers for the coal mines have retained a few **semi-skilled workers** on a salaried basis for roles related to driving, but not necessarily for the transportation of coal. It was noted that when the mines were operational, the contracting organisations hired all working adults in the household, including women of the family. But, **after the closure of the mine, only men were employed, which impacted the overall household income of these contractual workers**.

Daily wage earners sourced and hired by private organisations have either migrated to cities or to other mining districts. The rest reported being employed in various job roles in the region, which include – fishery, vegetable vendor, fast food vendor, package delivery personnel, rickshaw or e-rickshaw driver, potters, and working as unorganised coal miners. However, it was indicated that **workers have been inconsistent in such job roles** and were making ends meet by being employed for only 12 to 15 days a month. During the remaining period, they were engaged in looking for alternate sources of employment.

### 5.2.3 Case for 'Just' Transition

Securing sustainable and decent livelihood for the people who are dependent on the coal industry through proper planning and investments forms the basis of a 'Just' Transition. The Project Officer of Kabribad OCP stated that **in addition to direct employees of the sector, 'Just' Transition must also consider indirect workers** since a coal mine generates employment across the value chains - for example, truck drivers transporting coal from one location to another, restaurants or food hawkers serving coal miners and drivers, and others. **CCL personnel indicated that their organisation makes alternate arrangements for its employees in case of a mine closure**, often transferring them to another nearby mine. Further, it was stated that indirect workers often have transferable skills and are more likely to find alternate sources of employment, like, a truck driver transporting coal tends to become a bus or taxi driver to earn a living.

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*CCL provides salaries worth Rs 10 crores to its employees in the Giridih district. This amount is spent by the workers within the district, sustaining its economy - workers earn money and then spend their salaries on buying groceries, clothes, etc. within the same neighbourhood and community. Hence, the closure of a particular mine will have a ripple effect on the employment and economy of the district or area in which the mine is located.*

Project Officer at a coal sector organisation in Giridih

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Besides the impact on the livelihood of coal sector workers, mine closures will have environmental ramifications as well. Compared to the fanfare associated with active mines, closed mines are accorded little attention. However, the situation is changing with awareness regarding the revitalization of closed mines.

CCL personnel in Giridih emphasized that **a mine closure plan is prepared for all mines** at the risk of closure in the short term (due to resource depletion or unprofitability), which provides an effective plan for the after-mining landscape. On similar lines, mine closure plans have been prepared for Kabribad OCP as its resources are expected to only last for 5-6 years more. The Environment Officer at Kabribad OCP highlighted that **an environmental impact assessment is being conducted for the Kabribad OCP**, which accounts for the plan of coal extraction from the mine, plan for workers to be employed once the mines are operational, plan for afforestation, plan for restoration of the land upon final closure of the mine, solutions to grievances raised by communities residing in core and buffer areas of coal mines during public hearing sessions, among other things. Further, it was highlighted that **Giridih district is also planning to incorporate learnings from Dhanbad district's recent mine closures, wherein BCCL developed three eco-parks in the mining area**.



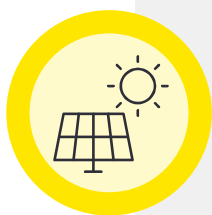
The interactions with district-level Government officials and district-level CCL personnel indicated that they were not privy to CIL's or the Central Government's overall plans regarding the closure of mines or their strategy for reducing carbon emissions. Their awareness was limited to the area or project in which they were employed.

Reflecting on India's Net Zero Commitments, the Environment Officer at Kabribad OCP suggested that considering coal's importance in India's economy, it is unlikely that coal production will completely stop even by 2070. Furthermore, it was highlighted that since technology is rapidly advancing, it is difficult to predict the circumstances in 2070 with certainty. There have been several technological advancements recently to reduce both, waste, and emissions, from the coal industry; like - repurposing 'fly ash' to make bricks, redesigning chimneys at coal plants to release less toxic smoke, carbon gasification, and many others.

Though stakeholders highlighted the importance of technological advancements in the coal sector, renewable energy will witness considerable growth in India, which propels the argument for an eventual coal phase-down and the achievement of net zero by 2070. **Currently, renewable energy - especially solar power - is highly cost competitive, even with respect to coal. India is one of three countries (along with China and Australia) where renewable energy is cheaper by 12 to 29% compared to the lowest-cost fossil fuel available in the country.**<sup>122</sup> Additionally, India has already achieved its target of reaching a 40% share of power generation from non-fossil fuel sources and aims to reach a renewable energy capacity of 500GW by 2030.<sup>123</sup> Thus, **the case for renewable energy in India points towards a scenario where coal mines and thermal power plants become increasingly economically unviable.**<sup>124</sup>

## 5.2.4 Way forward

### Renewable Energy in Giridih



India has targeted about 450 GW of installed renewable energy capacity by 2030 - about 280 GW (over 60%) of which is expected from solar. Considering this, the state of Jharkhand unveiled its Solar Energy Policy 2022 where it announced a slew of policy measures to attract private investors. Furthermore, **Giridih was selected as the "solar city" of Jharkhand**, wherein it will act as the model district for the establishment of solar panels and solar power plants, such that a considerable amount of the district's electricity requirements are met from solar energy. For this, Jharkhand Renewable Energy Development Agency (JREDA) recently invited EoIs from developers to set up an 18 MW grid-connected solar power plant project through a renewable energy company model under Giridih Solar City Program.

Although such measures by the state government are aimed at reducing the dependence on conventional energy sources to meet the increasing power demand, it will also **increase the scope for employment in the district.**

### Agriculture and agro-based industries in Giridih



Although the region of Giridih is known for its immense mineral deposits, **majority of the population is engaged in agriculture to sustain their livelihood.** The rural population in the region practices agriculture, dairy, poultry, and apiculture. The region has abundant water resources in form of rivers, ponds, lakes, etc., and fishing has emerged as a popular occupation in the rural areas.

This sentiment was echoed by the Project Officer at Kabribad OCP, who stated that **post the closure of Giridih OCP, many former indirect employees worked in the fisheries sector in the district.** As per reports, approximately 7,000 families in the district rely on fishing to earn their livelihood.

Further, many people in the region are engaged in seasonal farming and work in the mining industry during the non-season (farming) months, while the urban population primarily works in the agro-based or mineral extraction industries.

<sup>122</sup> <https://mercomindia.com/renewable-power-cheaper-fossil-fuel-report/#:~:text=According%20to%20Wood%20Mackenzie%20forecast,India%2C%20Australia%2C%20and%20China.>

<sup>123</sup> <https://pib.gov.in/FeaturesDeatils.aspx?NotelId=151141&ModuleId=20=%202>

<sup>124</sup> <https://ieefa.org/articles/ieefa-new-coal-fired-power-plants-india-will-be-economically-unviable>



#### Non-Timber Forest Products (NTFP) industry in Giridih

The tribal population in the region is engaged in manufacturing handicraft products made from lac, wood, bamboo, honey-bee wax, etc. They often sell their products in nearby cities and in other states too.

The region is surrounded by dense forest which also offers other avenues for occupation like, the sale of essential medicinal herbs (like Basil), extraction of honey and dairy products, and sale of 'Tendu leaves' used for making *beedis*.

A 2020 report<sup>125</sup> from the Initiative for Sustainable Energy Policy (ISEP) noted that **for Jharkhand, the main hurdles in the pathway towards just transition** included - a lack of investment and policy, besides poor institutional capacity and over-reliance on coal for energy needs. However, with the **state government taking steps towards diversifying investment in its energy sector, and the availability of employment** in non-coal industries, Giridih can work towards achieving a 'Just' Transition.

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<sup>125</sup><https://sais-isep.org/wp-content/uploads/2020/10/Regional-Policy-Perspective-On-Energy-Transition-In-Jharkhand.pdf>

# 6

## Developing Policy Mechanisms for a 'Just' Transition





## 6 Developing Policy Mechanisms for a 'Just' Transition

Planning for a Just transition of the coal sector workforce in Jharkhand will require structural changes at the policy and industry level, considering the nature of dependence and the socio-economic status of most coal mining areas in the state. At an overarching level, the data from primary interactions with coal sector workers points towards **growing apprehensions with respect to the future of their employment**. Despite the apprehension, certain workers exhibit a **high adaptive capacity in terms of finding alternate sources of livelihood in case of the closure of mines and power plants**. However, such an adaption might entail large-scale intra as well as inter-state migration. On the other hand, at the policy level, preliminary interactions have highlighted a lack of employment and training opportunities in the state, leading in the direction that it might be difficult to absorb coal sector workers in alternate sectors.

A NITI Aayog report<sup>126</sup> states that the **demand for coal will remain strong in the near future and will peak by 2030**, led by usage from the power sector, this was verified in the primary interactions with NITI Aayog as well. However, the Central Government's push to convert all CIL mines into profit-making mines has resulted in the **closure of underground mines across subsidiaries since underground operations are not cost-effective**. CIL has closed 80+ loss-making mines in the last four years<sup>127</sup>. Underground mines typically employ many more workers than open-cast mines, but with much lower productivity. Most of these underground mines are in five states – West Bengal, Madhya Pradesh, Chhattisgarh, Jharkhand, and Maharashtra. Several coal mines are also closed due to resource depletion.

The recent mine closures in Jharkhand in the districts of Dhanbad, Giridih, and Ramgarh, among others may serve as **pilots for evolving short-term and long-term strategies to ensure that the most vulnerable populations do not suffer the brunt of the net zero transition** and that it is a just transition for them, as has already been committed by the Chief Minister of Jharkhand.

The current approach of deploying workers from a closed mine to another mine as witnessed in Giridih will only work till the time the coal sector is expanding and more mines are opening than being shut down. However, as has been established in the previous sections, this will not always be the case. Both the central and local Governments must have a plan and mechanism in place for the transition to minimize and mitigate the livelihood risk. The mechanisms will have to be customized to meet the requirements of specific communities in Jharkhand through planning for transition, continuous dialogue with the workers in the sector, and mobilizing funds.

The **absence of a clear timeline for the phaseout of coal, coupled with conflicting signals on the use of coal**, will pose a challenge for states to plan a multi-decadal transition process. It is recommended that, in the year of G20, **India should outline clear timelines for the energy transition, including the financing support it would need to enable this transition**.

**This section outlines the challenges expected to arise at the policy, sectoral and individual levels in the short term, i.e., till the year 2030, when the coal production is expected to peak, and long term i.e., the years after 2030 when coal mines may close more rapidly**. Recommendations and policy mechanisms have been developed and mapped with the challenges at each level to mitigate them efficiently and effectively. Both the challenges and recommendations are based on findings from primary and secondary research.

Planning and interventions at the policy level are likely to be the guiding force based on which sectoral and individual-level stakeholders will respond to a shift in the coal industry. Since policy-level stakeholders include both the Central and State Governments, it is expected that they will set the precedent for what is to come given their overarching presence in the coal sector through central-level ministries, state departments, and through PSUs.

The challenges faced by stakeholders at the sectoral level vary in terms of scope and possible remedial action. This is because sectoral-level stakeholders may only be able to directly influence the circumstances of their organised workers, who are a part of their primary circle of influence.

Individual-level stakeholders involved and associated with the coal sector, whether it is through direct or indirect employment or through organised or unorganised employment, will face the harshest challenges due to a slowdown in coal activity. Though they will experience the most challenges, in terms of remediation, these stakeholders will largely be at the receiving end of policy-level and sectoral-level interventions.

<sup>126</sup> <https://www.niti.gov.in/sites/default/files/energy/Energising-India.pdf>

<sup>127</sup> <https://www.financialexpress.com/market/cil-shuts-underground-mining-with-centre-push-to-convert-all-mines-profitable/1559373/>



## 6.1 Short-term scenario (Till 2030)

Areas around coal mines in Jharkhand are heavily dependent on coal, where coal mining and other coal sector activities are at the core of the many district economies. As elaborated above, the coal demand and production are going to increase during this time. Moreover, there will remain large reserves of coal in India even after the peak, which is predicted to last at least 60 to 70 more years as per primary discussions. New mines will continue to be commissioned and existing large mines will be expanded to keep up with the increasing demand for coal.<sup>128</sup> However, in the short term, coal mine closures will still happen, mostly among small mines in isolated pockets and among underground mines due to reasons of environmental sustainability and lack of profitability of mines.<sup>129</sup>

With this scenario, there are going to be challenges regarding various aspects related to the policy, industry, and individual worker-level landscape that will overlap with one another. Such intersections will prompt a need for multidimensional and multistakeholder level planning in the short term to ensure the immediate effects of small and underground mine closures are contained and to devise steps for a smooth transition in the future.

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*Planning for a Just Transition must be multi-dimensional and multi-level. The whole coal ecosystem needs to be overhauled, with the top-brass of the state government leading such a change. Something of this scale and importance cannot be undertaken by individual government agencies or private companies and organisations.*

Official in Government of Jharkhand

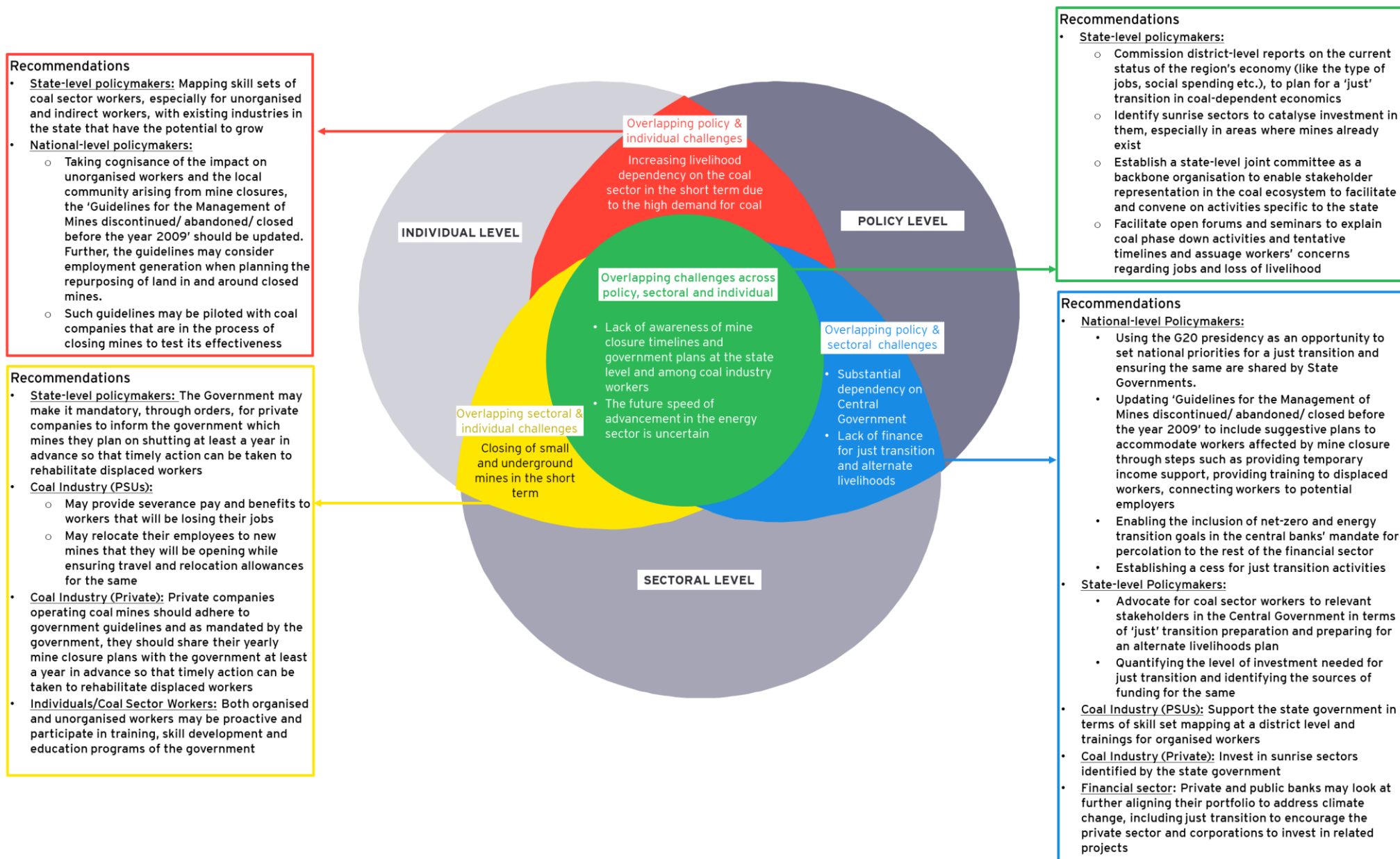
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<sup>128</sup> World Bank presentation to the Ministry of Coal for providing Support to Achieving a Just Transition in India's Coal Sector

<sup>129</sup> World Bank presentation to the Ministry of Coal for providing Support to Achieving a Just Transition in India's Coal Sector

Figure 43: Short-term mapping of challenges and recommendations across policy, sectoral, and individual levels



### 6.1.1 Challenges and Recommendations

Challenges in the short term emerge from various sources, which require action from different stakeholders to ensure an effective Just Transition plan. These challenges and recommended steps are elaborated below.

#### 1. Increasing livelihood dependency on the coal sector in the short term due to the high demand for coal

Given that the government plans to increase the production of coal, the number and sizes of mines will also increase. This will inadvertently attract more workers to the sector. Similar to the current constitution of workers in the sector, the additional workers will be across the coal value chain, including organised and unorganised, direct, and indirect. With such a rise in the number of workers, the dependencies on the sector will also increase, especially in terms of livelihood. Such a dependence will create difficulty for national and state-level policymakers in the long term to transition these workers out of the sector.

#### Recommendations:

- ▶ **State-level policymakers:** The state government may undertake an exercise to map the skill sets of coal sector workers, especially for unorganised and indirect workers, with existing industries in the state that have the potential to grow. By identifying sectors and the skills required for them, the government can facilitate skill development and training activities for workers. With such capacity development exercises, workers may have an easier time transitioning from coal when mines do close as they will have the required skills that will be needed in industries other than coal.
- ▶ **National-level policymakers:** The Central Government released an updated version of the mine closure guidelines titled 'Guidelines for the Management of Mines discontinued/ abandoned/ closed before the year 2009' in October 2022.<sup>130</sup> Though the guidelines indicate certain social support measures, they may be revised to **account for the impact on indirect and unorganised workers along with the local community** residing within the core and buffer zone of a coal mine. Additionally, the guidelines have a section on monitoring; however, it may be strengthened further to include caveats to ensure accountability and monitoring of coal companies in following the guidelines. Moreover, the guidelines may explicitly consider employment generation when planning the repurposing of land in and around closed mines as it currently only calls for "project-specific economic repurposing activities" with respect to the alternate use of reclaimed land. As seen in the case study of Giridih district, repurposing the land to build a park/pond leads to the generation of considerable employment at the construction stage and also post-construction when such ponds may be used for fishery-related activities, among other things.
  - With respect to land reclamation, the guidelines may also include directions on the ownership of the said land, clearly dictating whether the land occupied by the closed mine will be given back to the company that was previously operating the mine or if it will fall under the jurisdiction of the State or Central Government. The inclusion of such an ownership mechanism will dictate the level and type of investment for developing the land, which will have an impact on the sustenance and future livelihood of the communities in and around it.
  - Changes to the Plan may also consider the Detailed Project Report that the World Bank will be submitting on environmental reclamation and land repurposing on the principles of just transition.<sup>131</sup> Such guidelines with accountability and monitoring measures may be piloted with coal companies that are in the process of closing mines to test their effectiveness. Such a gradual rollout through pilots can be planned in selected districts, which can overlap with the districts covered in this study.

#### 2. Lack of awareness of mine closure timelines and government plans at the state level and among coal industry workers

- ▶ **State-Level Policymakers:** Primary interactions with stakeholders in the district of Giridih indicated that the local (state or sub-state) government is not informed on plans for mine closures. Thus, when these mines do close, there is little time for the local administration to account for the impact it has on workers and the local economy, especially in terms of mitigating job losses. Moreover, given that in the short term, it is mostly small or underground mines in isolated pockets that are likely to be shut, the effect on workers is multiplied as they are left with few options for alternate livelihoods. Such an impact can leave them more socially and economically bereft and push them to migrate without a choice.

<sup>130</sup> <https://coal.nic.in/sites/default/files/2022-10/28-10-2022a-wn.pdf>

<sup>131</sup> <https://coal.nic.in/sites/default/files/2022-05/31-05-2022a-wn.pdf>

- ▶ **Individuals/Coal Sector Workers:** Many workers are of the view that coal is going to continue indefinitely as indicated in primary-level interactions with them. Such a perspective on the future of coal may make it difficult for them to prepare for the future and make themselves resilient when mines do start shutting down.

#### **Recommendation:**

##### **State-level policymakers:**

- ▶ The state government may consider commissioning reports and studies to gather updated data on various elements of the region's economy-like type of jobs, social spending, etc. Along with such reports, the government may also consider estimating the number of people (direct and indirect and in family units) that will be impacted by the closure of mines in their community. Since rehabilitation measures will require a combination of aspects pertaining to rural development, skilling, and agriculture among others, such information databases will help the government streamline efforts from various departments and stakeholders and allow them to focus effectively on measures that will support the community. Thus, it will enable the government to undertake informed decision-making for planning for a just transition in coal-dependent economies. Subsequently, the state government can formulate a draft roadmap for those affected directly and indirectly.

Further, states may identify and bolster support for sunrise sectors to catalyse investment in them from the private sector. Moreover, the government may encourage their development in areas where mines already exist in order to diversify such mono-industry towns that are highly intertwined with mining. Some industries that show the potential to grow in the state include:<sup>132</sup>

- Renewable energy
  - Forest-based industries
  - Textiles
  - Sericulture
  - Handicrafts and handloom
  - Tourism
- ▶ The state government may also consider establishing a Joint Committee as a backbone organisation to facilitate and convene on the above activities specific to Jharkhand. A Joint Committee will also allow for representation from various stakeholders (industry players, workers, policy think tanks, etc.) that are part of the coal ecosystem in Jharkhand to incorporate their views and interests. This can be in line with the Ministry of Coal's proposed Just Transition division with the World Bank.<sup>133</sup>
  - ▶ The state government may consider the facilitation of open forums and seminars to explain coal phase-down activities and tentative timelines and assuage workers' concerns regarding jobs and loss of livelihood. This may be done with support from grassroots organisations and key community influencers. Not only will this prevent backlash from workers during mine closures but also help the government in building Just Transition policies that are futuristic and realistic.

### **3. Closing of small and underground mines in the short-term**

Many underground and small coal mines in Jharkhand, producing lesser coal compared to bigger ones, are likely to be shut down by companies in the short term due to their economic unsustainability. Coal mine workers working in small mines or underground mines that will most likely be decommissioned might lose their jobs. Unorganised workers also face pronounced challenges:

- Lack of employment safety net and benefits
- Inequitable access to government or private sector programs for skilling/ education as compared to organised workers
- Lack of access to healthcare and safety measures due to the informal nature of employment
- Since their work is not legal, they are constantly at risk of getting caught by law enforcement officials

Moreover, through primary interactions, coal sector workers indicated that they do not have much knowledge of government skilling programs and plans, which causes a certain level of uncertainty with regard to their preparedness for the future. Furthermore, there is also low awareness of government benefit schemes - those that do know of them, do not always avail scheme benefits.

<sup>132</sup> [https://justtransitioninitiative.org/wp-content/uploads/2021/10/CoalDependentCommunities\\_Report.pdf](https://justtransitioninitiative.org/wp-content/uploads/2021/10/CoalDependentCommunities_Report.pdf)

<sup>133</sup> <https://coal.nic.in/sites/default/files/2022-05/31-05-2022a-wn.pdf>



Given the above challenges of a lack of awareness of government plans for the future and the closure of small and underground mines, it may be difficult for them to plan for future scenarios with regard to sustaining their livelihoods.

#### **Recommendations:**

- ▶ **State-level Policymakers:** The Government may make it mandatory, through orders, for private companies to inform the government which mines they plan on shutting at least a year in advance so that timely action can be taken to rehabilitate displaced workers
- ▶ **Coal Industry (PSUs):** Companies may consider providing compensation in the short-term to workers who get impacted by the closure of small or underground mines:
  - Companies may provide severance pay and benefits to workers that will be losing their jobs
  - Companies may relocate their employees to new mines that they will be opening while ensuring travel and relocation allowances for the same
- ▶ **Coal Industry (Private):** Private companies operating coal mines should adhere to government guidelines and as mandated by the government; they should share their yearly mine closure plans with the government at least a year in advance so that timely action can be taken to rehabilitate displaced workers
- ▶ **Individuals/Coal Sector Workers:** Both organised and unorganised workers may be proactive and participate in training, skill development, and education programs of the government to better equip themselves for a future transition from coal. This will especially be useful for unorganised workers to move to the organised sector

#### **4. Substantial dependency on Central Government**

Since coal mines are largely owned and operated by PSUs, they are dependent on the central government in terms of their future business plans and activities. Thus, without guidance and cues from the government, they are unlikely to take steps towards supporting the social aspects of coal mine closures, especially with regard to the organised workers that they employ. During the stakeholder interactions, low awareness regarding the Central Government's existing mine closure and alternate livelihood plans was observed among sectoral experts and coal industry officials.

#### **Recommendations:**

- ▶ **National-level Policymakers:**
  - Given India's G20 presidency in 2023, the Central Government may use it as an opportunity to set national priorities with respect to an energy transition as well as ensure that such priorities are shared by State Governments. One of India's key focus areas is 'Green Development and Lifestyle for Environment,' which includes energy transitions. Such dialogue may contain further details on what an energy transition in the context of India's net zero commitments entails, especially with respect to the type of projects that will enable such a transition. At the same time, it may also take into consideration the role that various states, such as Jharkhand, can play with respect to the same. This will act as a strong precedent by the Central Government and may allow State Governments to follow suit.
  - As suggested above, the Central Government may consider updating 'Guidelines for the Management of Mines discontinued/ abandoned/ closed before the year 2009' to include suggestive steps and plans to accommodate and employ workers that will be affected by mine closure. Currently, the guidelines only account for the health of the community, especially with respect to respiratory diseases, and with little reference to the livelihood impact. Further, though the guidelines indicate that "careful consideration is to be given to provide reskilling to willing workers," the guidelines may detail this out further to include unorganised and indirect workers as well. It is important to consider indirect workers in the unorganised coal sector. Recommended steps include:
    - Providing temporary income support (e.g., severance pay, Direct-benefit transfers through social security schemes)
    - Increasing workers' capacity to qualify for jobs in new sectors by providing skills or entrepreneurship training to displaced workers
    - Connecting workers to potential employers through job search assistance and mobility grants
- ▶ **State-level Policymakers:** State and sub-state level administration may advocate for coal sector workers to relevant stakeholders in the Central Government and request action towards ensuring a Just Transition and preparation of an alternate livelihood plan for displaced coal sector workers. Further, the state may incentivize private sector investment and job creation in areas of mine closures
- ▶ **Coal Industry:** Companies may be proactive to support the state government in various capacities in relation to organised workers since companies will have direct access to them:

- Companies may undertake district-level analysis in terms of assessing the skill sets of workers, to support government skilling plans and strategies.
- Based on the gaps assessed in the skill sets of organised workers, companies may provide trainings, in line with the Ministry of Coal's Five-Year Vision Document 2019-24. The document outlines roles for PSUs to increase the employability of local youth in coal areas by conducting large-scale surveys to identify skills and partnering with relevant training agencies to provide employable skills with the required infrastructure for the same.<sup>134</sup>
- ▶ **Coal Industry (Private):** Private companies may invest in sunrise sectors identified by the state governments and in just transition projects indicated by the national government. Not only will this allow such companies to diversify their revenue source but will also help develop the local economy and increase the employment pool for coal sector workers, organised and unorganised, direct, and indirect.

## 5. Lack of financing for just transition and alternate livelihoods

Currently, in India, there is a lack of financing for a just transition and alternate livelihoods. This poses an important challenge as the inflow of capital is required to implement any just transition and alternate livelihood plans. Just to meet its NDCs, India requires USD 2.5 trillion between 2015 and 2030.<sup>135</sup> Similarly, under the larger ambit of climate finance, a just transition plan would require large amounts of investment. In this regard, both the financial sector and the national government can play a role to encourage investments in the same.

### Recommendations:

- ▶ **National-level Policymakers:**
  - Through the central bank, national-level policymakers may enable the inclusion of net-zero and energy transition goals in the bank's mandate. Given that the central bank is at the apex of the financial system, such prioritization will percolate to the rest of the financial sector, both nationally and internationally such as through MDBs.
  - The Central Government may also consider establishing a cess that will be earmarked for just transition activities. This may be accompanied by a deployment plan to states, that will take into consideration the level of dependence of certain states and their communities on coal and factors such as the proportion of unorganised and indirect workers.
- ▶ **State-level Policymakers:** The State Government may consider quantifying the required levels of investment that will be needed for just transition and alternate livelihoods, including for the various types of activities and interventions that the government expects such a transition to entail. This quantification and estimation will act as an important step in the narrative for just transition financing. Additionally, this may also be accompanied by an identification of the sources of funding for a just transition for the state.
- ▶ **Financial sector:** Private and public banks may look at further aligning their portfolio to address climate change. Though there has been a considerable impetus towards funding the renewable energy sector that supports an energy transition,<sup>136</sup> banks may also specifically look at extending credit to projects addressing social aspects of a just transition. These may include projects working towards reskilling labour and establishing alternate employment generation, above and beyond renewables. Such signals from the financial sector will also encourage the private sector and corporations to invest in such projects.

## 6. Lack of health and safety measures in existing mines

Workers indicated that they have limited health and safety measures, with many suffering from ailments like asbestosis and silicosis. Many explained that only a select few coal mine workers have access to healthcare facilities provided by their employers since a majority of them are contractual in nature.

<sup>134</sup> [https://coal.gov.in/sites/default/files/2021-01/vision\\_document.pdf](https://coal.gov.in/sites/default/files/2021-01/vision_document.pdf)

<sup>135</sup> [https://assets.cdcgroup.com/wp-content/uploads/2021/07/09130404/Towards-a-just-transition-finance-roadmap-for-India\\_July-2021.pdf?id=1](https://assets.cdcgroup.com/wp-content/uploads/2021/07/09130404/Towards-a-just-transition-finance-roadmap-for-India_July-2021.pdf?id=1)

<sup>136</sup> [https://assets.cdcgroup.com/wp-content/uploads/2021/07/09130404/Towards-a-just-transition-finance-roadmap-for-India\\_July-2021.pdf?id=1](https://assets.cdcgroup.com/wp-content/uploads/2021/07/09130404/Towards-a-just-transition-finance-roadmap-for-India_July-2021.pdf?id=1)

### Recommendation:

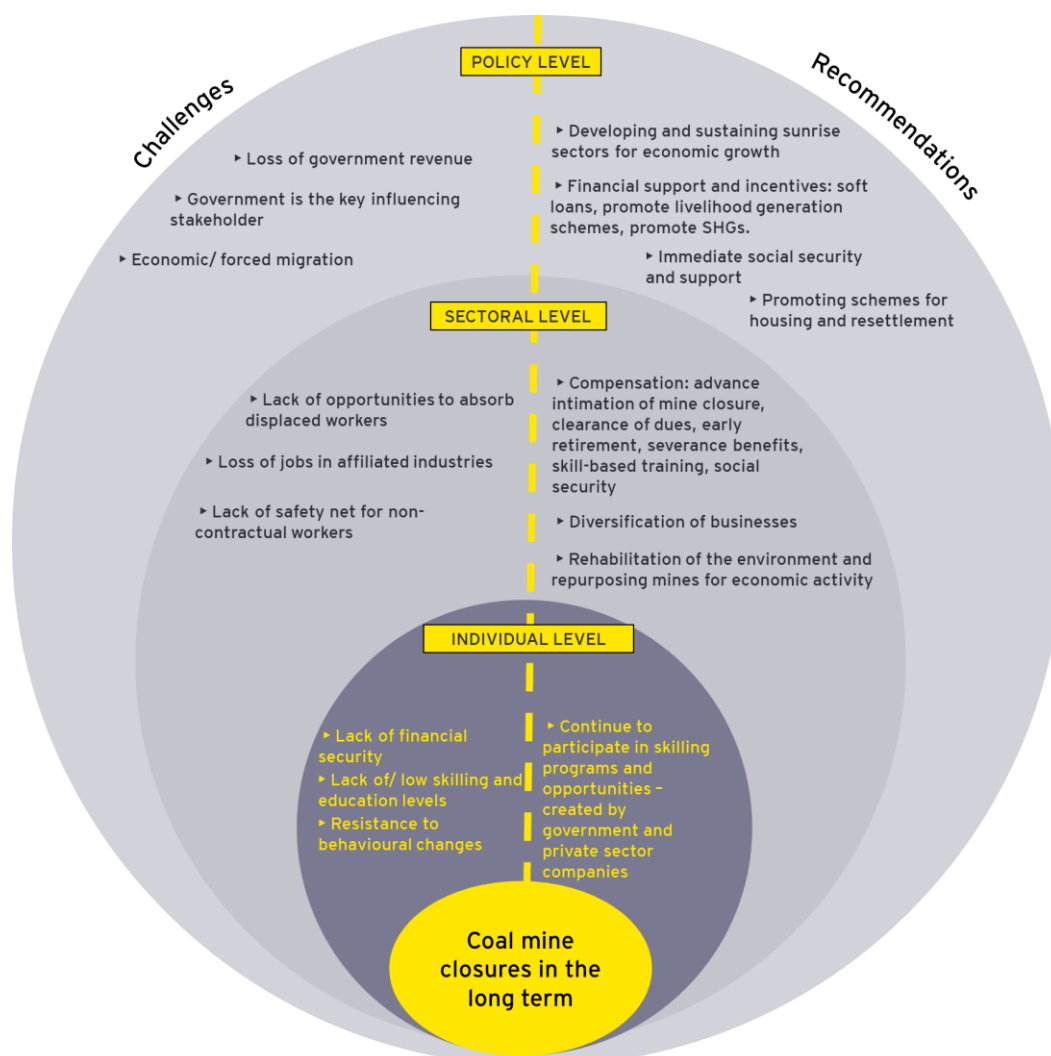
- ▶ **National-level Policymakers:** The government may institute stricter labour laws to include health and safety measures, especially for contractual workers through CIL. By addressing these concerns of workers, the government and industry players in the coal sector can start accounting for their social welfare, which too is an important component of a 'just' transition.
- ▶ **State-level Policymakers:** State government may help in ensuring enforcement of such measures by coal mining companies in their state through regular check-ins from law enforcement authorities

## 6.2 Long-term scenario (Post the year 2030)

It is estimated that a shift from coal may be accelerated after the year 2030. The fall in demand and supply of coal and the eventual coal mine closures are looked at as a cause for concern, due to the heavy dependence of local communities for employment and other economic activities. Coal sector workers and communities that have been built around mines and power plants will require support to sustain themselves and to shift to alternate industries, given their current education and skill sets and the fact that mining regions have very few other employment opportunities. A shift from coal mining activities would also put a strain on the government's revenues at both the central and state level since it generates a large portion of it from coal royalties. Moreover, with the potential decline in coal mining, all stakeholders, especially PSUs, will be looking to the government with regard to transitioning. For companies such as CIL, diversification will likely be the way forward in terms of sustainability in a coal phase-down scenario.s

Approaching these challenges through a top-down approach allows for understanding the linkages between actions on one level to another and highlights the importance of collaboration amongst stakeholders to effectively manage and mitigate the situation.

Figure 44: Long-term mapping of challenges and recommendations across policy, sectoral, and individual levels



## 6.2.1 Policy-level: Challenges and Recommendations

As the key influencing stakeholder in the long term, policymakers will face multiple challenges owing to the closure of coal mines, including – a loss in government revenue, dealing with the migration of workers, and leading the pathway for a ‘just’ transition. Since there is a need for the coal phase down to be smooth and well-managed, so that it does not cause a “shock” to the economy, the role of policymakers will be critical in planning for the same.

### 1. Loss of government revenue

Royalties from the coal sector form a large portion of the Central Government and the Jharkhand State Government’s annual revenue. With a phase-down in coal, a reduction or loss of this revenue is expected, which may create challenges for the government. Furthermore, given that railways also derive a large portion of their revenue from coal transportation, a loss of revenue for the railway industry is also expected.

**Recommendation:** The government may continue to make efforts in developing the sunrise sectors and make them sustainable in the long term. This would not only facilitate overall economic growth in various industries and support government revenue but would also promote opportunities for employment for impacted workers. Additionally, in an effort to spur initial investments in these sectors, the government may give tax breaks to industry players.

### 2. Government is the key influencing stakeholder

Due to the government’s positioning as the largest stakeholder in the coal economy, it is expected that various other stakeholders ranging from individual-level workers to companies, will continue to look towards the government for guidance and support in the long term as well. This will imply that the government and other actors on the policy level would need to step in and provide support to other stakeholders, while also working through the impacts of a coal phase-down.

#### Recommendations:

- Support may be provided by the government in the form of soft loans to displaced workers with entrepreneurial aspirations. This may enable them to initiate small businesses in sectors outlined by organised and unorganised workers that are relevant to their skill set and appropriate to Jharkhand, such as animal husbandry, fishery, piggyery farming, duck farming, mushroom cultivation, making of scented sticks, and bamboo handicraft articles.
- The government may also provide support to the groups that are expected to face the harshest impact of a coal phase-down in the long term such as the unorganised coal sector workers and women working in the coal sector.
  - It is recommended that the government may promote livelihood generation schemes, especially amongst unorganised coal sector workers as a means of support.
  - The government may support the formation of SHGs, especially for women coal workers who have been impacted. Among coal workers, women, especially in the unorganised sector play an important role in contributing to household income. Along with that, they are also responsible for household chores and the upbringing of children, which further indicates the important role that they play in the family. Government support may enable them to set up micro industries, which will further support coal workers to pivot to different job roles. SHGs may be supported in various indigenous sectors in Jharkhand, like Sericulture (Jharkhand is the leading producer of Tasar silk in the country), production of handicrafts, utensil making from leaves, tendu leaves collection, broom making, and papad and pickle making.



*In moving to other sectors, gender plays an important role. The woman in the family plays a crucial in getting food on the table. Given their role, they will be key players in bringing about behaviour change to move to other livelihoods.*

Director (Climate Policy) at a think tank



### 3. Increase in migration

With the closure of mines and thermal power plants and the following loss of employment from it, it is possible that a relatively large-scale migration may be triggered that the government may have to tackle. This possible migration would be within the district level (workers moving between districts looking for work) or within the state level (workers migrating to other states in the employment search).



**Recommendation:**

As a means to mitigate large-scale migration, the government may provide immediate social security and support as a buffer between the loss of jobs and re-employment in alternate industries. This would allow workers time to find new employment or obtain the skills necessary for alternate employment within their region, rather than migrating. Furthermore, social security and support can also be supplemented through schemes for housing and resettlement in other areas which provide livelihood opportunities.

## 6.2.2 Sectoral level: Challenges and Recommendations

In the long term, sectoral-level players may have to continue facing the challenges that will come with displaced workers, especially contractual, in both the coal sector and affiliated industries.

### 4. Lack of opportunities to absorb displaced workers

Currently, there are not enough employment opportunities in the state to absorb workers that may be displaced by the closure of mines. While it has been predicted that within the energy industry, the rise of renewable energy may provide some employment opportunities, this number would be insufficient with regard to the number of displaced workers.

**Recommendation:**

To mitigate this challenge, it is recommended that companies may provide compensation to workers, especially contract workers through:

- Advance intimation of mine closure
- Clearance of dues with proper rationales for the closure of mines
- Options for early retirement plans with severance benefits for older employees
- Skill-based training
- Social security
- References for new employment

### 5. Loss of jobs in affiliated industries

It is expected that with the phase-down of coal in the long term, industries that are heavily interlinked with the coal sector such as the cement and steel industries would also face a reduction in business, which may further lead to a loss of jobs.

**Recommendation:** To manage and mitigate the rippling effect of the downsizing of businesses and loss of jobs for workers, it is recommended that coal companies and affiliated industries may look to diversify their business offerings to retain and absorb their employees in roles related to coal mining. Not only will the diversification help with the loss of jobs for workers but may support industries and businesses as a whole.

### 6. Lack of safety net for contractual employees

The majority of workers in the coal sector are employed as contractual workers. It is expected that since many industry players hire contractual workers, companies cannot provide the same safety net to them that they can to their permanent employees when coal mines begin shutting down.

**Recommendation:** To work through this challenge, companies may help increase employment opportunities by undertaking the rehabilitation of the environment and repurposing mines, in line with the Coal Mine Closure Guidelines set out by the Ministry of Coal as indicated in the short-term as well. Not only will this spur economic activity in the region, but it will also help with the generation of local employment opportunities that may provide a safety net for contractual coal sector workers. Such activity may also provide support to policy-level stakeholders in managing the challenge of migration.

### 6.2.3 Individual level: Challenges and Recommendations

With a loss of jobs in the long term, workers may further fall into a vicious cycle of poverty, unless support is provided by policymakers and sectoral experts in the coal industry.

#### 7. Workers are stuck in a vicious cycle of poverty

It has been observed that workers are stuck in a vicious cycle, where due to a lack of financial stability they are unable to pursue education and skilling opportunities. This financial instability and limited awareness of other opportunities feed into resistance towards behavioural change as well, since mining has been the only industry that they have been exposed to. These three issues, compound together creating a large obstacle for workers on the individual level.

- **Lack of financial security:** Primary data shows that most of the workers working in the coal sector do not have enough savings for more than 4 weeks in the event of a mine closure. This is a large challenge for individual workers given that lack of savings limits their options in terms of alternate livelihoods and even causes forced migration to an extent. Since many workers in the coal sector are contractual workers, they do not expect a large safety net for themselves from their employers, causing further uncertainty and a lack of security for workers.
- **Lack of/low skilling and education levels:** The lack of skills and education acts as an obstacle for workers to find employment in alternative industries.
- **Resistance to behavioural change:** Resistance to behaviour change is anticipated even in the long term because many workers have been working at these mines for generations. Though such activities will be undertaken in the short term, coal workers might still resist transitioning to alternate sectors in the long term.

**Recommendation:** In line with the provision of skilling activities and trainings in the short-term, the government may continue such efforts in the long-term scenario as well to account for workers that may have been left out in the short term. They may also continue to facilitate open forums and seminars, with a focus on increasing awareness of skilling programs and government schemes to mitigate the challenges that workers are likely to face.

## 6.3 Conclusion

There is an increased focus globally on a 'just' transition for coal communities, given that coal mining areas support entire ecosystems and ways of living. Simultaneously, **India has set forth a target of achieving net zero by 2070**. Despite this commitment, demand for coal has not yet peaked in the country, with the **Government aiming to produce 1 billion tons of coal by 2023-24 and continuing to commission thermal power plants**. Thus, **in the short term, coal production and consumption are going to increase in India and consequently in Jharkhand**, which is endowed with one of the largest reserves of coal in the country. However, given that coal is a non-renewable resource, is facing competition from more cost-effective alternatives like renewable energy, and is under pressure internationally due to its carbon footprint, it is inevitable for coal to phase down eventually in the long run. **With the closure of mines, workers in the coal value chain will face the biggest impact**. Due to the nature of mining regions, there is a **lack of alternative opportunities that workers can transition to, which will evidently affect their earnings and livelihoods**. Such a scenario necessitates further research into the worker landscape in the coal economy. With this background, the study focused on the coal sector in Jharkhand to understand the implications of a 'just' transition for organised and unorganised workers in the sector, especially in terms of alternate livelihoods.

**Most opinions depicted by supply, demand, and policy stakeholders revolved around the denial of a coal phase-down in the country during the short term**, affirming their belief in the coal sector's likelihood to sustain the livelihoods of workers. On the other hand, a smaller group of stakeholders believed even if coal is not going to phase down in the short term when it does, it will have significant repercussions with regard to the livelihoods of coal sector workers in the long term. Coal sector workers in Jharkhand, who are the backbone of the 'just' transition landscape, mirror the former view, rejecting possibilities of a coal phase-down due to their lived experience of working in mines where they have witnessed an abundance of coal. Moreover, these workers are highly dependent on the sector as they have been working in it for generations. Their dependence indicates that they have rarely considered moving out of it, even though a majority of them are not employed formally. Additionally, in case of a decrease in mining, many of these workers do not have savings to sustain themselves and their families while on the lookout for jobs. This tenuous relationship combined with a **lack of awareness of the future of the coal sector among workers highlights the importance of a 'just' transition for them**.

In terms of alternate livelihoods, certain industries are better suited to their needs whereas others are not. **Though renewable energy is on the rise in the country, it is concentrated in the western belt**. The uptake in Jharkhand has been dismal even though the state has a large potential for solar power. Moreover, the **employment opportunities in the renewable energy sector are low compared to what the coal sector can offer to its workers**. The skill set required for it is also more advanced than what coal workers possess. In this regard, renewable energy presents few opportunities in terms of absorbing displaced coal sector workers, unless combined with intensive reskilling.

**For delineating sectors that can buttress displaced workers, the study recommends consolidating it from the perspective of what the workers would prefer to work in and what is feasible as per the economy of Jharkhand**. Coal sector workers have indicated a preference for sectors such as agriculture, manufacturing, mining for other minerals, construction, education, and service. On the other hand, industries that best suit the economy of Jharkhand include agro-forestry, tourism, and handicrafts among others. It is important to identify sunrise sectors in the state and the required number and types of job roles that they will entail before workers are given support to transition from coal.

**The study recommends that the transition to such other industries and sectors should be facilitated at an individual, sectoral, and policy level in both the short term and the long term**. The short term entails a rigorous planning process to account for the impact of coal mine closures in the long term. This is not to say that there will be no mine closures in the short term, but they will most likely be at small mines in isolated pockets. At the policy level, the government may spearhead transition planning and activities during both the short term and the long term since the coal sector is highly entrenched with both the central and state government. Such interventions will not only involve facilitating skill development and providing immediate relief to workers after mine closures but also catalysing economic development in the state, especially in sunrise sectors. Given the cues from the government, industry players may follow suit, especially in terms of providing implementation and funding/ investment support. Finally, at the individual level, though there is little that coal sector workers can influence, they can be encouraged to become more resilient. This can be done through participation in skill training and awareness generation activities to bring about behaviour change regarding their dependence on the sector.

At an overarching level, **to implement interventions aligned with the provided recommendations, there is a need to establish synergy between the two schools of thought**. Hence, alignment between the first school of thought which believes coal-phase-down is unlikely to take place and the second school of thought which emphasizes the urgency towards planning for a phase-down is critical and lays the path toward a 'just' transition, in both the short term and the long term.

**The absence of a clear timeline for the phaseout of coal, coupled with conflicting signals on the use of coal**, will pose a challenge for states to plan a multi-decadal transition process. It is recommended that, in the year of G20, **India should outline clear timelines for the energy transition, including the financing support it would need to enable this transition**.





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