Understanding Just Transitions in Coal Dependent Communities

Case Studies from Mpumalanga, South Africa, and Jharkhand, India

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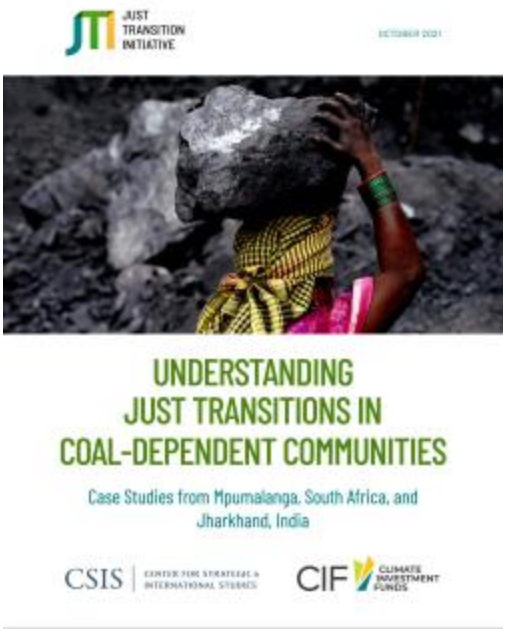
A daily wage coal laborer working in India. Photo Credit – Parwaz Khan

Meeting the Paris climate target of staying well below 2°C requires rapid reduction in the use of fossil fuels, particularly coal in large coal-dependent emerging economies such as South Africa and India. In both South Africa and India, coal transition will have socio-economic impacts on several provinces and states because of the regional nature of coal production.

The study explores state/provincial level coal-related socio-economic dependency in Mpumalanga and Jharkhand, and investigates the following key elements of just transition planning: 1) challenges and opportunities associated with the diversification of provincial/state economies; 2) prospects for the environmental rehabilitation of coal mines and power plants; and, 3) the landscape of stakeholders (including underrepresented stakeholders) important for just transition planning.



Report Recommendations

Drawing on the case studies of Mpumalanga and Jharkhand, this report provides insights and recommendations for a just transition away from coal in emerging economies.

- Additional analysis is needed to identify and quantify points of dependency and transition risks across the coal ecosystem for a just transition.
- In-depth feasibility and scalability assessments of regional economic diversification options are required to map and assess realistic regeneration pathways.
- Following a diversification mapping exercise, long-term pathways for diversification to alternate sectors need to be developed and should be grounded in local priorities.
- Government and coal company diversification plans need to be better coordinated to ensure transitions are well planned and inclusive.
- Strengthened regulatory regimes are needed for the effective environmental rehabilitation of current and legacy coal mines and power plants as part of the diversification of coal-dependent economies.
- Following mine closures, robust land use policies and plans are needed to ensure effective environmental rehabilitation and subsequent diversification pathways.
- Local stakeholders, including underrepresented stakeholders, must be meaningfully engaged throughout the transition process to ensure inclusive outcomes and buy-in.

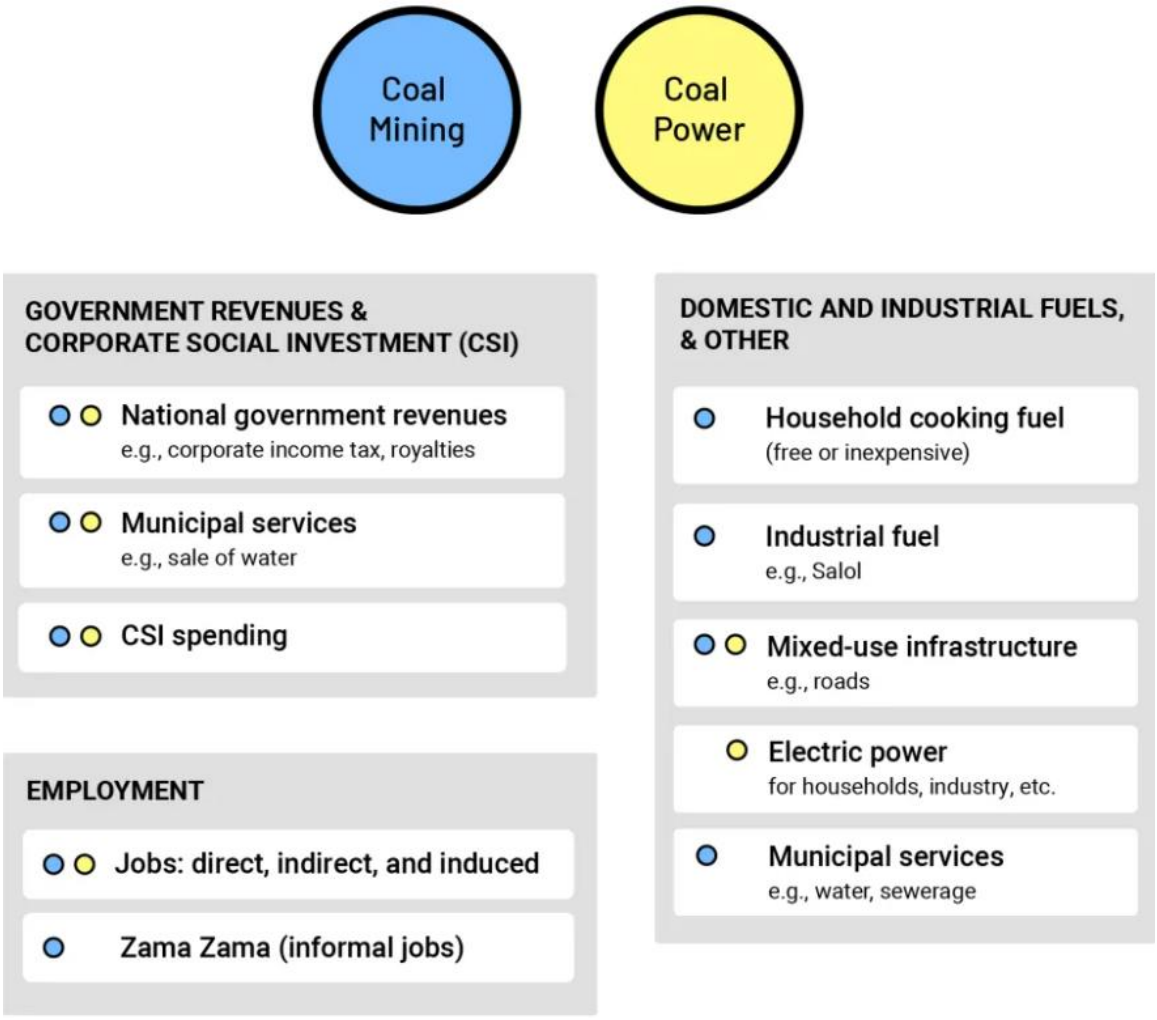
Region	Population (millions)	Unemployment Rate (%)	GDP Per-Capita (USD$)	Coal Production (MT)	Power Plant Capacity (GW)
Mpumalanga	5	34	5284	222	30
South Africa	60	33	5091	247	38

The Coal Ecosystem of Mpumalanga

How is the coal sector socio-economically integrated?

Mpumalanga is deeply dependent on its coal sector for jobs, local municipal services, social spending, industrial fuel, provision of (at times free) household cooking fuel and mixed-use infrastructure.

The blue circles indicate coal mining's socio-economic contribution; yellow circles indicate coal power's socio-economic contribution.



Challenges & Opportunities for Economic Diversification

How could Mpumalanga diversify for a just transition away from coal?

The sectors listed below could be part of a diversified future economy in Mpumalanga, as suggested by provincial government officials and experts. (This list was compiled by the report authors based on 14 interviews and document analysis.)

General Drivers	Barriers for Expanding These Sectors in Coal Dependent Areas
Agriculture	
Drivers	Barriers
• About 24 percent of the provincial land is arable, and 14 percent of	• The wages in the agriculture sector are low in comparison to those in the coal-related sectors, and many view

General Drivers	Barriers for Expanding These Sectors in Coal Dependent Areas
the land is available for natural grazing. • Only 1.5 percent of South Africa's soil is considered high potential, and 47 percent of this land is in Mpumalanga. • The province is a leading producer of fruits and nuts, among other agricultural crops. • Increased access to affordable food could help alleviate the high levels of food insecurity.	conditions on white farms as "a return to the slavery of the past." • The land is badly degraded in places where coal mining happens, making expansion of agriculture in these areas difficult. • The agricultural sector will compete with coal mining sectors for water and land resources until the coal sector is phased out.
Tourism	
Drivers	Barriers
• The province attracts millions of national and international tourists every year. • The Eastern part of the province is home to tourist hot spots, such as Kruger National Park. • There are several sites of historical and cultural significance, including the Botshabelo Heritage Site and the Loskop and Middleburg dams, in coal-dependent municipalities such as Steve Tshwete that could become tourism hot spots.	• Coal mines and power plants are located in western and central parts of the province, but the tourism centers are located in the east. There is a spatial mismatch between these two sectors, making it hard to determine who will derive benefits from a transition. • Coal-dependent local municipalities face severe environmental threats such as water pollution and land degradation. This remains a challenge for converting coal-dependent municipalities into tourism centers.
Manufacturing	
Drivers	Barriers
• Manufacturing industries, including petrochemicals, steel, and metals, already account for about 14 percent of provincial GDP. • There is high availability of skilled manufacturing labor, a quality electricity network, and emerging service industries.	• The manufacturing industries largely rely on coal as an input fuel. • The Mpumalanga Industrial Development Plan (MIDP) and its roadmap identifies manufacturing industries linked to mining sectors as "centers of competence" for promoting the manufacturing sector. This implies that existing provincial plans continue to promote coal mining as a raw

General Drivers	Barriers for Expanding These Sectors in Coal Dependent Areas
	material for manufacturing industries.
Renewable Energy Production	
Drivers	Barriers
• There is high availability of existing land and transmission and distribution lines. • There are suitable solar resources in most coal areas.	• South African laws do not allow private companies to build more than 100 MW of generating capacity without obtaining a generating license. Given the low employment intensity of renewables compared to coal mining or power, and the onerous licensing procedures, the 100 MW limit restricts job creation potential for these sectors. • Local entrepreneurs lack understanding of solar-sector opportunities.

Challenges & Opportunities for Environmental Remediation

How could Mpumalanga environmentally remediate for a just transition away from coal?

An underground coal mine that is on fire is under rehabilitation in Ermelo, South Africa. This burning land was in a spillway below dams that fed the town of Ermelo's water supply and was only rehabilitated after urgent action by an activist group.

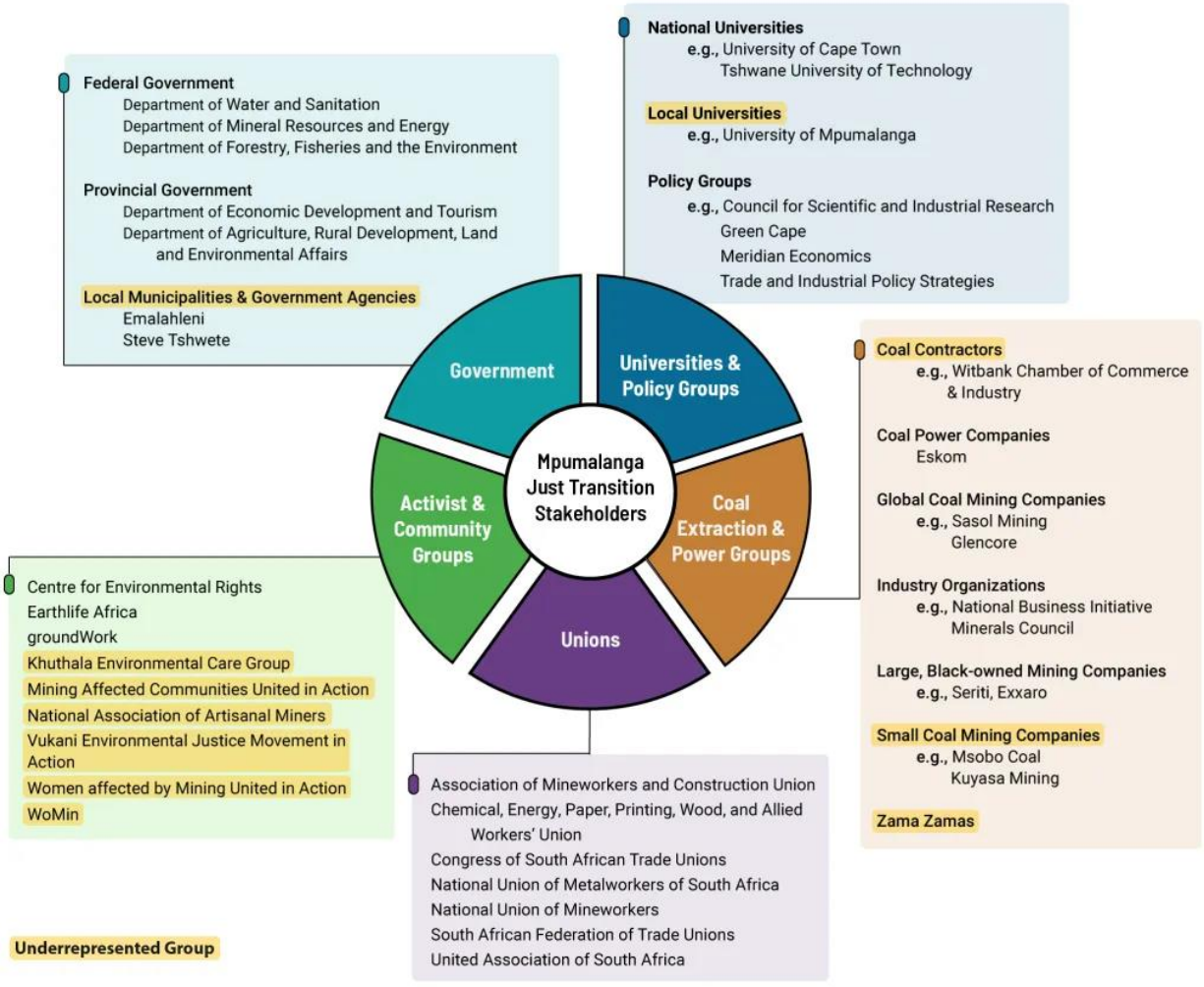
In Mpumalanga's case, mine closure plans and associated company financial allocations for rehabilitation projects are not transparent. There are also capacity gaps that restrict the oversight and enforcement of closure regulations. The region also suffers from legacy contamination from hundreds of coal mines.

Beyond much-needed reforms in the environmental regulatory regime, research is required to understand options for rehabilitation that can also help diversify the local economy and create jobs. Some initial ideas of rehabilitation options include growing fiber crop and bamboo which can be used to remediate degraded land in a way that is economically feasible.

Stakeholder Mapping

Who are currently the key stakeholders in the just transition conversation, and who among them is most underrepresented?

Based on 14 interviews, the authors identified stakeholders important to any just transition planning in Mpumalanga. Highlighted below are those currently underrepresented in the planning process.



Example of an Under-Represented Stakeholder: Zama Zamas

There is a sizable number of people who scavenge coal in Mpumalanga for either self-use or to sell it in the market. These workers are often referred locally as *Zama Zamas* or people who "try and try."

The *Zama Zamas* are informal workers or illegal miners.

”If the coal industry shuts down, I’d really love to do rehabilitation work. It is the one job I’d love because it involves protecting the environment.”

- Shlangu Jerry Dube, Zama Zama in Mpumalanga

An interview with another Zama Zama worker can be watched here.

In coal mining areas, Zama Zamas extract coal in abandoned, and often unsafe, mines using basic tools.

Mpumalanga Photos © Daylin Paul Photo. For use by CSIS and CIF only. Not for re-licensing or distribution.

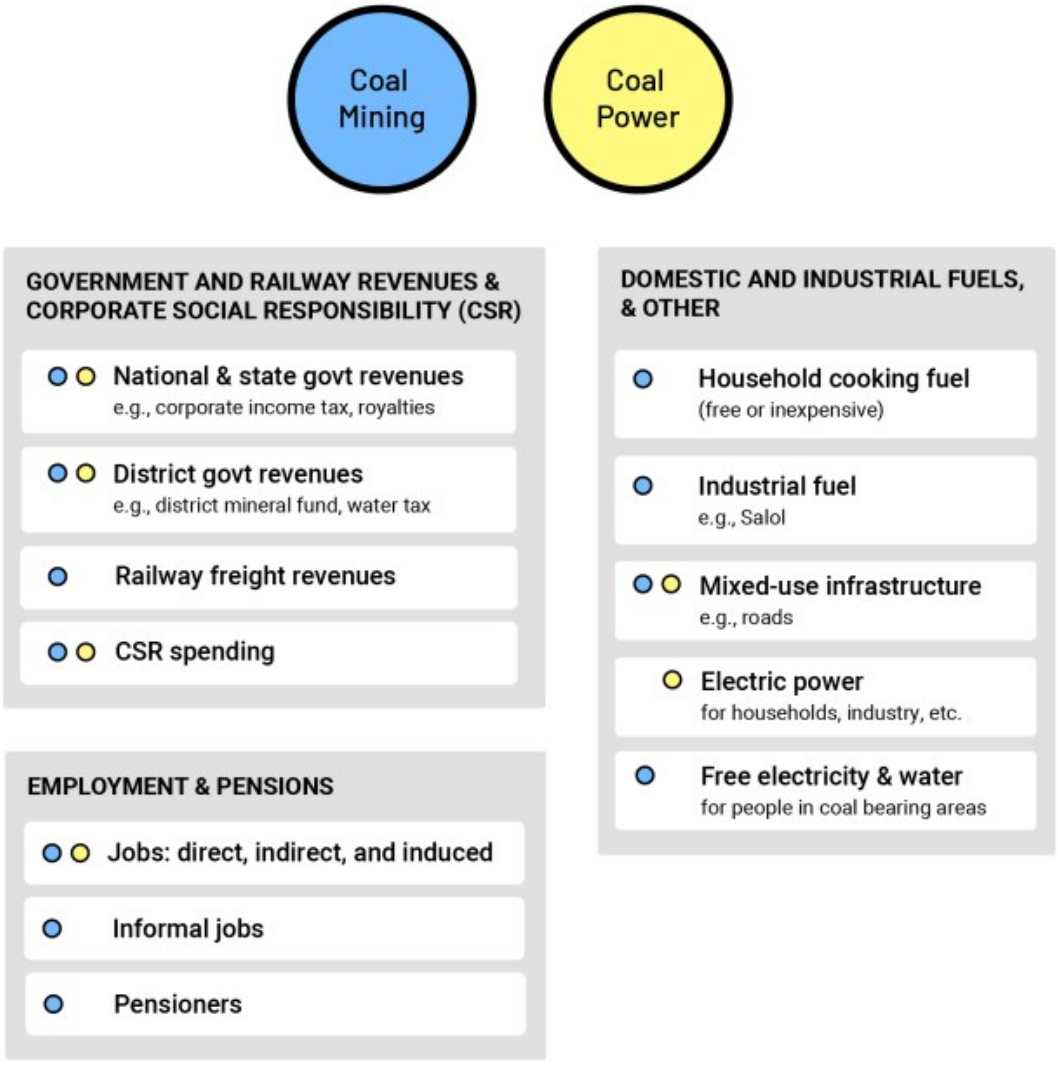
Region	Population (millions)	Unemployment Rate (%)	GDP Per-Capita (USD$)	Coal Production (MT)	Power Plant Capacity (GW)
Jharkhand	39	9	1173	130	2
India	1370	7	1900	779	208

The Coal Ecosystem of Jharkhand

How is the coal sector socio-economically integrated?

Jharkhand is deeply dependent on its coal sector for jobs, pensions, state and local government revenues, social spending, industrial fuel, household fuel, mixed use infrastructure and sometimes free electricity and water.

The blue circles indicate coal mining's socio-economic contribution; yellow circles indicate coal power's socio-economic contribution.



Opportunities for Economic Diversification

How could Jharkhand diversify for a just transition away from coal?

The sectors listed below could be part of a diversified future economy in Jharkhand, as suggested by experts. (This list was compiled by the report authors based on 11 interviews and document analysis.)

General Drivers	Barriers for Expanding These Sectors in Coal Dependent Areas
Agriculture	
Drivers	Barriers
• Agriculture and allied sectors already add 13 percent of the state's gross value added, compared to 9 percent by the mining sector. This means that skills and knowledge about the sector already exist. • Around 80 percent of Jharkhand's rural population depends on agriculture for their livelihoods, meaning many people have know-how and understanding of the sector.	• Agriculture is largely monocropped, and nearly 70 percent of land in the state falls in the marginal category (i.e., less than one hectare in size). • Nearly 50 percent of agricultural households are indebted, as income from agriculture is often insufficient to cover input costs. • According to the 2017–2018 Periodic Labour Force Survey, nearly 30 percent of agricultural workers are engaged in secondary off-farm employment. In fact, approximately 7 percent of agricultural workers are currently working in the mining sector as their second job. As the sector currently is not high paying enough, it may not be attractive for coal workers. • The land is badly degraded in coal mining districts, making expansion of agriculture in these places difficult. • In coal mining districts, the agricultural sector will compete with mining and other manufacturing sectors for availability of water and land resources. • Farmers are not able to reach larger markets. The lack of marketing of agricultural produce is a challenge.
Tourism	
Drivers	Barriers
• Called "the land of forests," Jharkhand is home to areas of natural beauty with rich varieties of flora and fauna,	• There is a history of travel safety warnings in the area due to security threats. This discourages tourist travel.

General Drivers	Barriers for Expanding These Sectors in Coal Dependent Areas
lending it to rural, eco, adventure, and heritage tourism. • Jharkhand's tourist numbers have doubled in the last four and a half years, increasing to 3.54 crore (35 million). • For every million rupees invested in the tourism sector, 89 jobs are created, versus 4 jobs in the primary sector and 13 jobs in the secondary sector. • The region could attract tourists with major spots such as Ranchi hill, Dassam Falls, the Konark Sun Temple, and the Baidyanath dham temple.	• The region lacks infrastructure to support tourism, such as comfortable lodging facilities and connectivity through road and rail. • It is a challenge to balance tourism with the need to preserve tribal lands, heritage sites, and natural resources. • Tourist inflows vary monthly, with lower tourist numbers during the rainy season and higher numbers during the winter and festival seasons. This results in largely seasonal work. • The land is badly degraded in coal mining districts, making them less attractive for tourism.

Non-Coal Mining	
Drivers	Barriers
• Forty percent of the country's mineral reserves are in Jharkhand • There are substantial reserves of iron ore, copper, bauxite, dolomite, manganese, and mica, among other minerals. • For any clean energy transition, India is likely to rely on domestic production of key minerals such as copper and iron ore.	• The expansion of mineral industries can have severe environmental impacts, including on the forests that sustain biodiversity and communities. • Non-coal mining reserves are in districts that do not produce coal. Thus, a shift to non-coal mining could require the relocation of workers. • About 30 percent of land in Jharkhand is forested, and most of the minerals are found in these areas. This often results in a conflict between mining companies, conservation efforts, and local, often tribal populations.

Non-Timber Forest Produce	
Drivers	Barriers
• Thirty percent of the state is covered by forests.	

General Drivers

- Due to different government initiatives, forested areas are expanding consistently.
- Among non-timber forest products, Jharkhand is the largest producer of Tussar silk (a non-mulberry silk), which is a leading example of sericulture. The sector is growing rapidly, registering a year-on-year growth rate of 15 percent. This growth makes it an attractive sector for diversification.
- Wild edible plants, another non-timber forest product, form an important constituent of traditional diets of scheduled tribes in Jharkhand. Most tribal groups use wild fruits, vegetables, and herbs to fulfill their food requirements and have sophisticated knowledge about their utilization. If this sector is scaled, it could become one of the diversification sectors.

Barriers for Expanding These Sectors in Coal Dependent Areas

- Opportunities in forest-based industries has not been quantified.
- Most people who rely on non-timber forest produce lack access to larger markets.
- Policymakers often focus on promoting large industries as opposed to small-scale, forest- and produce-based industries.
- Currently, sericulture provides mostly supplementary income, as the wages are low.
- The diversity of wild edible plants is falling in Jharkhand due to unsustainable harvesting for food and medicines. These plants are also being disturbed due to overgrazing, forest fires, and other factors.
- Edible plants cannot be planted in mining-contaminated areas due to human health hazards resulting from bioaccumulation of metals absorbed by plants.

Manufacturing

Drivers

- The state has a well-established manufacturing base, with many companies producing steel, cement, and auto parts, among other products.
- There is a strong base of existing skilled manufacturing labor.

Barriers

- The current manufacturing base uses coal as a major raw material. For example, the state accounts for 25 percent of steel production in the country.
- There is a lack of cost-effective technological alternatives for manufacturing steel and cement.
- Many manufacturers are small- or medium-scale units that lack the investment required to transition to non-coal powered manufacturing.

Renewable Energy Production

Drivers

Barriers

General Drivers

- The entire state and coal-reliant districts have high potential for solar energy generation, based on Global Horizontal Irradiance (GHI) levels.
- State-wide solar potential is 150 GW, which is nearly 40 percent of India's current total power capacity.

Barriers for Expanding These Sectors in Coal Dependent Areas

- Most of India's solar power investments are currently going to western and southern states such as Gujarat, Maharashtra, and Karnataka due to land availability, proactive policies, and grid infrastructure availability.
- Jharkhand's state distribution companies are in financial distress and have not been able to sign any power purchase agreements with solar developers to buy their power. Hence, the developers have been reluctant to invest in the state.
- Land availability remains a major constraint for setting up industrial projects, including solar projects.

Opportunities for Environmental Remediation

How could Jharkhand environmentally remediate for a just transition away from coal?

A view of open-cast coal mines at Jharia in Dhanbad district of Jharkhand in India

Environmental rehabilitation will be critical to just transitions planning in Jharkhand. Interviewees and document analysis suggest that the rehabilitation of mines faces significant challenges today because of a lack of mandatory post-mine closure regulations, inadequate financial provisions, and legacy contamination issues. The result is that whatever rehabilitation happens usually does not include post-mining land use activities.

It is important that India mandates coal mining rehabilitation that includes dealing with legacy contamination issues. Some good case studies of proper rehabilitation of coal mines in Jharkhand exist. These involve ecological restoration after the coal mine is closed and turning abandoned open-cast coal mines into fisheries. Further research is required to understand options for rehabilitation that can also help diversify the local economy and create jobs.

Key Stakeholders in a Just Transition

Who are currently the key stakeholders in the just transition conversation, and who among them is most underrepresented?

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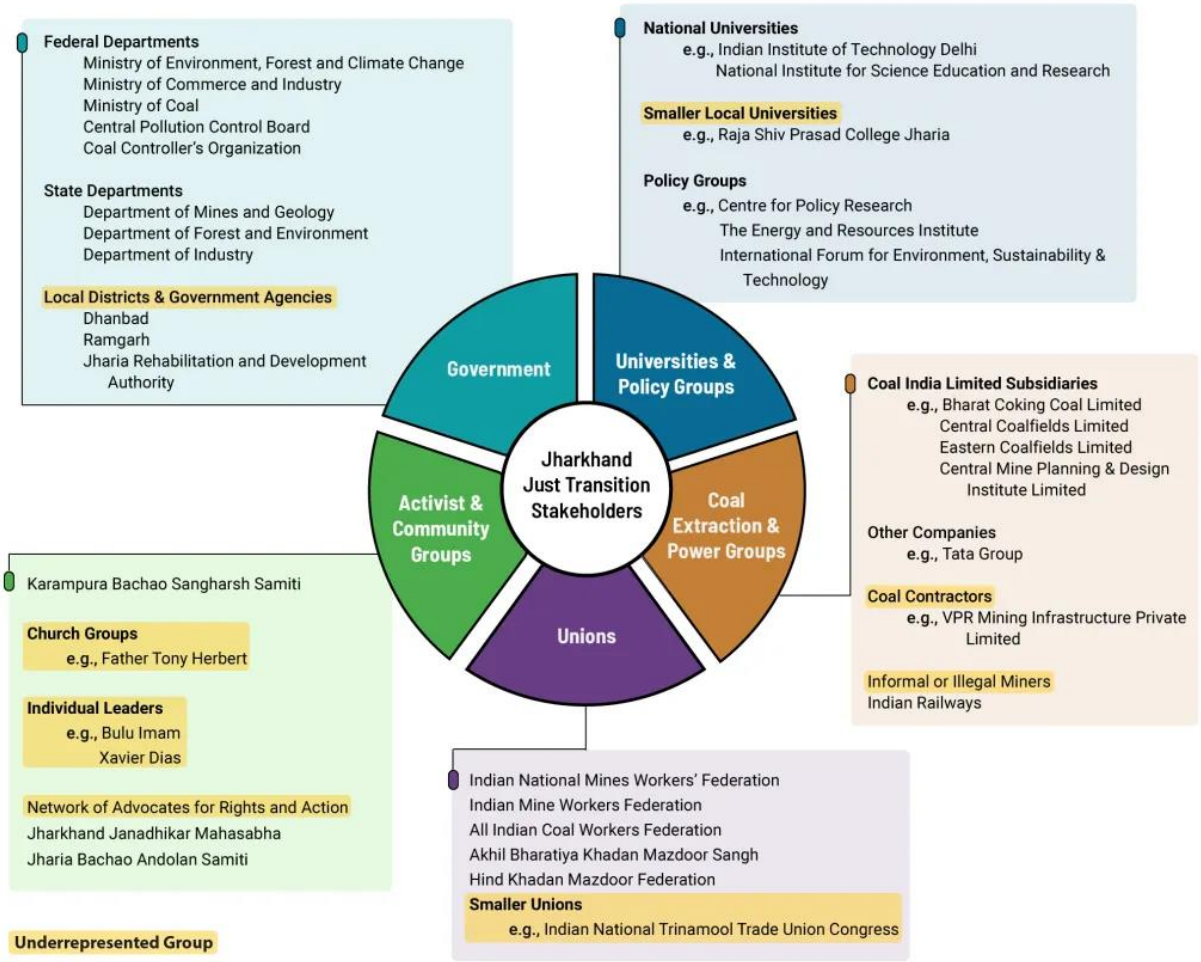

Example of an Under-represented Stakeholder: Jharkhand's Contractor Workers

There is a sizable number of coal contractor workers who work in the coal industry in Jharkhand. These workers often face major job uncertainties and do not have the same social security nets as employees of coal companies.

"I've been working in the coal mines for the last 25 years. If coal is finished, I will have to work as a daily wage worker. What else can we do."

- Nakul Ravidas, a coal worker in Jharkhand

These contractor workers are currently under-represented in just transition dialogues in Jharkhand. Watch here.

Contractor workers collect coal with basic tools, as shown below in this open-cast mine in the Dhanbad district of Jharkhand.

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