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An inquiry into the challenges and opportunities for a post-coal future

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ABBREVIATIONS AND ACRONYMS

AAY	Antyodaya Anna Yojana
AITUC	All India Trade Union Centre
BCCL	Bharat Coking Coal Limited
BMS	Bharatiya Mazdoor Sangh
BRGF	Backward Region Grant Fund
CCL	Central Coalfields Limited
CEA	Central Electricity Authority
CFR	Community Forest Resource
CIL	Coal India Limited
CITU	Central Industrial Trade Union
CPCB	Central Pollution Control Board
CSR	Corporate Social Responsibility
DAY	Deendayal Antyodaya Yojana
DGMS	Director General of Mine Safety
DMF	District Mineral Foundation
ECL	Eastern Coalfields Limited
ECSC	European Coal and Steel Community
GDP	Gross Domestic Product
GER	Gross Enrolment Ratio
GIS	Geographic Information System
GPDP	Gram Panchayat Development Plan
HDI	Human Development Index
HMS	Hind Mazdoor Sabha
ICDS	Integrated Child Development Service
IEA	International Energy Agency
IGC	Industrial Growth Centre
IIDC	Integrated Industrial Development Centre
IISD	International Institute for Sustainable Development
ILO	International Labour Organisation
INTUC	Indian National Trade Union Congress
IPCC	Intergovernmental Panel on Climate Change
IPHS	Indian Public Health Standard
IPPE	Intensive Participatory Planning Exercise
ITUC	International Trade Union Confederation
LFPR	Labour Force Participation Rate
MDO	Mine Developer and Operator
MLA	Member of Legislative Assembly
MPI	Multidimensional Poverty Index
MoEF&CC	Ministry of Environment, Forest & Climate Change
MSME	Micro, Small and Medium Enterprises
MT	Million Tonnes
NCWA	National Coal Wage Agreement
NDC	Nationally Determined Contribution
NMET	National Mineral Exploration Trust
NRLM	National Rural Livelihood Mission
NTFP	Non Timber Forest Produce
NUHM	National Urban Health Mission
OBC	Other Backward Class
OC	Opencast
OECD	Organisation for Economic Cooperation and Development
PFC	Power Finance Corporation
PLF	Plant Load Factor
PLFS	Periodic Labour Force Survey
PMJAY	Pradhan Mantri Jan Arogya Yojana
PMKKKY	Pradhan Mantri Khanij Kshetra Kalyan Yojana
PMKSY	Pradhan Mantri Krishi Sinchayee Yojana
PMUY	Pradhan Mantri Ujjwala Yojana
PRI	Panchayati Raj Institution
PSU	Public Sector Undertaking
PTG	Primitive Tribal Group
PV	Photovoltaic
RE	Renewable Energy
SAGY	Saansad Adarsh Gram Yojana
SAIL	Steel Authority of India Limited
SC	Scheduled Caste
SCCL	Singareni Collieries Company Limited
SDG	Sustainable Development Goal
SECC	Socio Economic and Caste Census
SHG	Self Help Group
ST	Scheduled Tribe
TISCO	Tata Iron and Steel Company Limited
TPDS	Targeted Public Distribution System
TPP	Thermal Power Plant
UG	Underground
UNFCCC	United Nations Framework Convention on Climate Change
U5MR	Under 5 Mortality Rate
USEIA	U.S. Energy Information Administration
WHO	World Health Organisation

FOREWORD

The world today stands at a critical juncture where our scientific and technological progress, and trajectories of economic growth are being challenged by the planetary boundaries.

Among them the most significant threat is that of climate change. The amount of greenhouse gas emissions (GHG) the atmosphere can hold is rapidly approaching the tipping point. The report of the Intergovernmental Panel on Climate Change (IPCC) in 2018 is a clarion call for action for all those who believe in science and humanity.

While fossil fuel sources dominate our primary energy supply, we cannot afford to continue further in this pathway. It is time for us to start moving away in a carefully planned fashion from coal.

A transition away from coal will certainly not be an easy task for India, a country with nearly 250 years of coal history. Through decades, coal has not just become the backbone of our industrial growth and energy security, it has become part of the cultural history of coal mining areas, where people's lives and livelihoods have been shaped by the coal industry. A life without coal is, therefore, impossible to envision in coal-bearing areas.

However, what seems impossible to achieve, can always be a possibility, if we change our mindset. Because when we do that, it allows us to ask challenging questions. And once we are ready to ask those questions, we think of innovative pathways through which the seeming impossible becomes achievable.

A transition away from coal demands such change in mindset, which in turn would propel innovations. We will need innovations in technology, in policy, in planning and overall, in our approach of dealing with a challenge of this scale, and the change we are envisioning. In short, we will need to re-invent the system totally, which I call as total innovation.

A just transition framework, which this book proposes, provides an architecture for such innovations recognising the urgency of climate action. While the climate crisis constitutes the basis of this research, the book provides an objective assessment of the social and economic realities of the coal mining areas and its people. The analysis on one hand recognises the importance of coal, whereas on the other hand, tries to identify pathways to move away from coal dependence, considering opportunities in hand and those that can be harnessed.

The idea of a just transition, in fact, is complimentary to the energy transition that India has already embarked on and is progressing rapidly. This is because the growing share of renewable energy in electricity and other forms of energy supply will automatically drive down the demand for coal mining in the coming years. This will worsen poverty and deprivation in India's coal mining regions, which many of them are burdened with. Energy transition, therefore, will cause deprivation in the coal mining areas, if a just transition is not considered simultaneously.

I hope this book will make a meaningful contribution towards future research on just transition in the context of India and the global South, and will guide climate change, energy and mining policies, that are innovative, sustainable and socially just.

Raghunath Anant Mashelkar, FRS
National Research Professor

EXECUTIVE SUMMARY

A shift away from the fossil fuel economy is inevitable, considering the urgency of the climate crisis. However, this transition raises fundamental concerns about the fate of the fossil fuel industry workers and the communities dependent on such industries. Building on the demand of labour rights and environmental justice movements, there is a growing recognition that the workers and the local communities should not shoulder the burden of energy transition. Hence, there is a need to develop a 'just transition' framework to ensure decent work opportunities and social support systems for the fossil fuel industry workers and to overall improve the socio-economic and environmental conditions of these regions. This concept of just transition was included in the preamble of the Paris Agreement in 2015.

Since its formal recognition in the climate treaty, just transition has become an important component of the climate change discourse. While countries of the global North are engaging on just transition through a mix of policies and strategic measures, the concept has not gained much traction in the global South, particularly among major coal economies, like China and India. Arguments of reliance on coal mining and energy security (over 71% of electricity generation in India is from coal-based power) has kept the issue at bay.

However, five critical factors must compel us to think otherwise. These include the growing competitiveness of reliable power supply from renewable energy sources, the environmental and social externalities of coal mining which even our best practices cannot offset, the need to improve the socio-economic conditions of coal mining areas, the urgency with which we must act to avoid the catastrophic impacts of climate change, and the increasing unprofitability and unplanned closure of coal mines. In fact, a transition away from coal should not be a trade-off between the environment and economy. Global experience suggest that a timely and well-planned just transition can lead to overall positive economic, social, and environmental outcomes.

There is, however, no one standardised approach for just transition. This is primarily because the dependence on coal and the nature of the transition will vary from country to country and from region to region within a country. Any approach to just transition thus needs to be evaluated in a country-specific manner and planned in the context of respective coal mining regions.

This study was undertaken to understand what just transition means in the context of India's coal mining areas and what should be the essential components of a just transition framework. To understand the ground realities, Ramgarh, one of the major coal mining districts of Jharkhand, was chosen as a case study.

Ramgarh is among the top five coal-producing districts of Jharkhand, but its mining activities are shrinking. About 50% of mines in the district have closed down or have been temporarily discontinued because of various factors, including unprofitability. The remaining mines (many of them are also unprofitable) have a life of about 10-25 years, and there are very few new ones in the pipeline. Therefore, coal mining activities in the district will largely phase out in the next decade or two, making it a perfect case for a prospective just transition. Further, the district's socio-economic profile, demographics, land use pattern, natural resource base, and its strategic location close to the state's capital offers an interesting canvas to understand how coal mining has shaped the district's economy and its social relations, and what a just transition for such a region entails.

The Ramgarh case study is largely based on an extensive primary survey of 406 households (selected through stratified random sampling) to ascertain the coal dependency and vulnerability of local communities and capture their perception of coal mine closure and aspirations of alternative livelihoods. Besides, focus group discussions (total 14) were held with various stakeholders from coal mining areas. Semi-structured interviews were

also conducted with key stakeholders, including the Chief Minister of Jharkhand, political representatives at the state, district, and panchayat levels, labour union leaders, coal industry officials, the state and the district administration, and civil society groups.

The study also involved collecting and analysing secondary data to complement and validate the findings of the primary research. A geospatial mapping exercise was done to assess the socio-economic conditions and the natural resource base of the district.

While questions of coal dependency and vulnerability are complex and will vary from region to region, the Ramgarh case study brings out four key observations that are important for understanding just transition in India.

First, the dependence on coal mining for income is significantly high. In Ramgarh, one in four households derives some sort of earning directly from mining and related activities. But this dependence is largely informal and does not provide a decent income. Two-thirds of households reported an income between ₹6,000-10,000 per month (US$ 85-140/month). This group largely includes the 'non inventoried' people of the coal-economy, such as coal gatherers and sellers, casual labourers, and daily wagers. Only 7% of the households had a member with a formal job in coal mining or related industry.

Second, there is a direct correlation between the distance from the mines and the dependence on coal mining. While more than 40% of the households within a radius of 3 km from the mines derive direct income from coal (the majority of them being coal gatherers and sellers, casual labourers, and contractual workers), this proportion sharply declines to less than half for households living beyond 3 km of a mine. In fact, beyond 10 km from coal mining areas, agriculture is the most significant source of employment. The district's overall worker distribution, as per government data, also shows high agricultural dependence, particularly in the rural areas, which is as high as 75% of the total main workers. Therefore, coal mining dependence is quite concentrated in certain parts of the district.

Third, coal mining has not benefitted the region in terms of social and physical infrastructure. The district has extremely poor primary healthcare infrastructure, with a nearly 50% deficit in the required number of primary healthcare centres. Moreover, even the existing ones do not meet the necessary Indian Public Health Standards in terms medical staff, treatment facilities, etc. The same situation is with access to education and clean drinking water. In rural areas, only about 17% of households have access to the piped water supply. In fact, Ramgarh falls in the list of aspirational districts of the NITI Aayog, given its poor human development indicators.

Finally, and most importantly, a focus on coal mining and related industry over decades has stymied the development of other sectors and the diversification of the economy. In Ramgarh, agriculture, forestry, fisheries, and service sectors have suffered from an undue focus on coal mining. In fact, the perceived coal dependence in the mining areas can be argued to be a 'constructed' dependence.

From the Ramgarh study, what emerges is that just transition in India will not be a linear question of substituting a 'mono' industry (coal) along with its workforce. Instead, it is an economy-wide transition that provides an opportunity to reverse the 'resource curse' in coal mining areas. However, this does not mean that coal mines can be closed quickly. Instead, the mines must be closed in a planned manner so that there is minimum social and economic disruption. Side-by-side, the 'new' economy, and infrastructure will have to be built to support and enhance the livelihoods of those dependent on coal.

To achieve, a just transition, a planning architecture must be developed at the district-level around six specific yet inter-related pillars:

1. Defining timeframe for just transition;
2. Establishing an inclusive transition planning mechanism;
3. Providing alternative employment opportunities for formal and informal workers in the short-term;
4. Planning economic diversification, including industrial restructuring;
5. Improving social and physical infrastructure; and,
6. Identifying financial resources to support just transition.

But a just transition plan cannot be implemented at the district level without a well-coordinated effort between the state and the central government. In fact, the Ramgarh case study provides us with an understanding of what a just transition framework for India might look like.

Based on our study, along with observations from around the world on just transition policies and strategies, we propose an 'indicative' just transition framework for India structured around seven pillars:

1. Strong national and state government policy and financial support;
2. Diverse coalition among various actors and stakeholders;
3. Effective communication strategy and local engagement;
4. Economic diversification and social security planning;
5. Coal sector transition;
6. Social and physical infrastructure development; and,
7. Public and private investments for transition.

The central government will have the most crucial role in developing supportive policies and mechanisms. This will include formulating a just transition policy, supporting and building on existing laws and schemes to enable locally deliverable actions, providing a financial package, and pushing for an international framework to support just transition in developing countries.

The state government, on the other hand, will be at the front line for dealing with just transition by building a broad-based consensus and action plan to phase-out coal mining and strategising the socio-economic transformation using national policy and financial package. Simultaneously, the state should also develop its own economic and industrial strategy to steer away from coal dependence in terms of revenue, employment, and industries.

The actual planning and implementation will happen at the district level, where all stakeholders will need to engage through a participatory process. The Constitution of India has a solid underpinning for local-level planning, which has been used in the past by governments for district-level planning. Just transition planning should build on these.

Finally, the funding for just transition will have to come from by public and private sources. In fact, public investments will have to be leveraged to get large private investments in industry and infrastructure. Public funding will include local (such as, district mineral foundation funds), state, national and international sources. Just transition financing will have to rely on a convergence mechanism to pool all available resources.

Just transition is not a consideration of the future anymore. One of the most telling aspects of this study is that the issue is here and now. In many coal districts of India, mines are being temporarily or permanently closed without any framework in place to support the local economy and restore the local environment. Therefore, there is an immediate need to develop just transition plans for these areas to avoid economic and social disruptions.

The coal face of India is a complex one. Further in-depth work is required to capture the diversity in coal mining districts and develop various policies, strategies, and investment plans. This book is only the beginning and provides a reference point for facilitating a discussion on just transition framework and strategy. The discussion and action must begin now!

CLIMATE, COAL AND JUST TRANSITION

CHAPTER 1

INTRODUCTION

Pixabay

- India is the fifth most vulnerable country to climate change impacts.
- To stay within 1.5°C temperature rise, coal-based power plants must be phased out by 2050, recommends IPCC.
- India remains highly coal dependent; 47% of the country's primary energy supply and 71% of electricity generation is from coal.
- The dominance of coal in India's power sector is steadily declining due to competition from renewable energy.
- Through an in-depth study of Ramgarh, a major mining district, this study aims to understand what just transition means for India.

Limiting the risks from global warming of 1.5°C in the context of sustainable development and poverty eradication implies system transitions.

—IPCC, 2018

1.1 THE COAL CONTEXT

Over the past two decades, the urgency to build a low-carbon society has gained momentum from policy corridors to broader public discourse. The growing body of research on climate change has made it clear that a shift away from the fossil-fuel economy is inevitable. The question is by when and how.

The Paris Agreement in 2015 and the report of the Intergovernmental Panel on Climate Change (IPCC) in 2018 have set the timeframe for the transition. To avoid catastrophic impacts of climate change, the world needs to limit global warming well below 2°C above the pre-industrial levels and pursue efforts to limit the temperature increase even further to 1.5°C.[1] For this, global carbon dioxide emissions will have to reduce by 45% by 2030 from 2010 levels and reach net-zero by 2050. This will necessitate a massive reduction in the use of coal, as it accounts for nearly 44% of global CO_2 emissions.[2] Therefore, the IPCC has recommended phasing out of coal-based power plants by 2050 and adopting a 'system transition' in electricity generation, largely relying on renewable energy sources.[3]

Coal-based electricity has already started to face headwinds. A mix of environmental and energy policies and competition from cost-efficient renewables is steadily squeezing it out of the global electricity mix. For instance, the contribution of coal to global electricity generation has reduced from 40% in 2010 to 36.4% in 2019.[4] Global investments in new coal-fired power projects have also been declining over the past years.[5] Both the U.S. Energy Information Administration (USEIA)[6] and the International Energy Agency (IEA)[7] have predicted a significant decline in coal consumption in the years ahead.

In India, while coal consumption is on the rise, coal's dominance in the power sector is declining. India's coal power sector has been ailing financially over the past decade due to surplus capacity, low plant load factor, and a dramatic decline in renewable energy prices. Besides, major global and local innovations in energy storage systems are making uninterrupted power supply possible from renewable sources like solar at a competitive tariff.[8] Over the past five years, capacity additions in renewable energy have surpassed the new capacity addition in thermal power. The Central Electricity Authority (CEA) has projected that by 2029-30, the share of renewables in the total installed electricity capacity will be nearly twice of coal and lignite-based sources.[9] This will have a significant bearing on India's coal production as a significant portion of coal, about 66%, is used for electricity generation.[10] If coal requirement in power plants starts reducing significantly, many coal mines will have to be shut down, and the need for opening new coal mines would soon become redundant.

Coal mining is also facing tremendous pressures on the environmental, social, and economic fronts. Most of the coal mining areas are critically polluted and also water-stressed. This is affecting health, as well as the livelihood of local communities. In addition, coal mining remains one of the major factors for forestland diversion (nearly 20-25% of total forestland diversion is due to mining, and about half of that is for coal), affecting forest-based livelihoods, a key source of livelihood of tribal communities.

The coal mining districts in top coal states such as Jharkhand, Chhattisgarh, Odisha, and Madhya Pradesh, also suffer from the 'resource curse'. The top 20 coal districts,

the backbone of India's energy sector, are underdeveloped and poor. More than 50% of the people in these districts are multi-dimensionally poor, exhibiting very poor health, education, and living standards.[11] The income levels in these districts are also meagre, with 85% of rural households having the highest-earning member making below ₹5,000 (US $69) per month.[12]

Lastly, while in totality coal mining is profitable (Coal India Limited has been recording profits), about two-thirds of the coal mines are unprofitable and are closing down. To meet the shortfalls, coal companies are opening new coal mines in coal fields that are new or less exhausted and hence profitable. But the closing of unprofitable and exhausted mines has huge socio-economic implications for districts and sub-districts (blocks) where these mines are located. In fact, there are districts where the majority of mines have already closed down, and the remaining are likely to close in the next 10-20 years. These districts suffered due to coal mining and are now suffering because of its unplanned closure.

Considering the various environmental, social, and economic factors and the imperative to avoid unplanned closure of coal mines, it is time we begin planning a transition away from a coal-based economy in a deliberate and phased manner. However, such a shift will not be a simple one. It will be a complex and long-term process involving all stakeholders and governments at all levels.

1.2 JUST TRANSITION

The socio-economic aspects of the energy transition process is now an essential component of the climate change discourse. Building on demands of labour rights and environmental justice movements, there is a growing recognition that the workers and the local communities should not shoulder the burden of a fossil fuel transition. The basic idea of just transition, therefore, is to ensure decent work opportunities and social support systems for the people whose livelihood is likely to be affected by the transition. Simultaneously, economic restructuring should be planned for a low-carbon future and sustainable growth, engaging various stakeholders in the decision-making process.

The discussion on just transition so far has mostly been limited to countries of the global North.[13] The conversation has not taken roots in major coal economies of the global South, such as China, India, and Indonesia. However, considering the collective response required for climate action, a discussion on planning a transition away from the coal economy should begin in these countries as well.

For India, ambitious global climate action is necessary considering the looming economic and social costs of the crisis. India is the fifth most vulnerable country to climate change impacts, as per the Global Climate Change Risk Index 2020.[14] Studies suggest that the country risks losing 2.5% to 3% of its GDP due to the climate crisis by 2050 under business as usual scenario.[15] It is in India's interest that the global emissions are reduced significantly, and serious effort is made globally to meet the 1.5°C goal. For this, India will have to take a leadership role in climate action.

By putting just transition at the center of its climate mitigation plan, India can send a strong signal to the world that it is willing to play such a leadership role. Just transition will not only help India push for global collective action, it will also help the country build a sustainable and resilient economy in the coal-dependent regions.

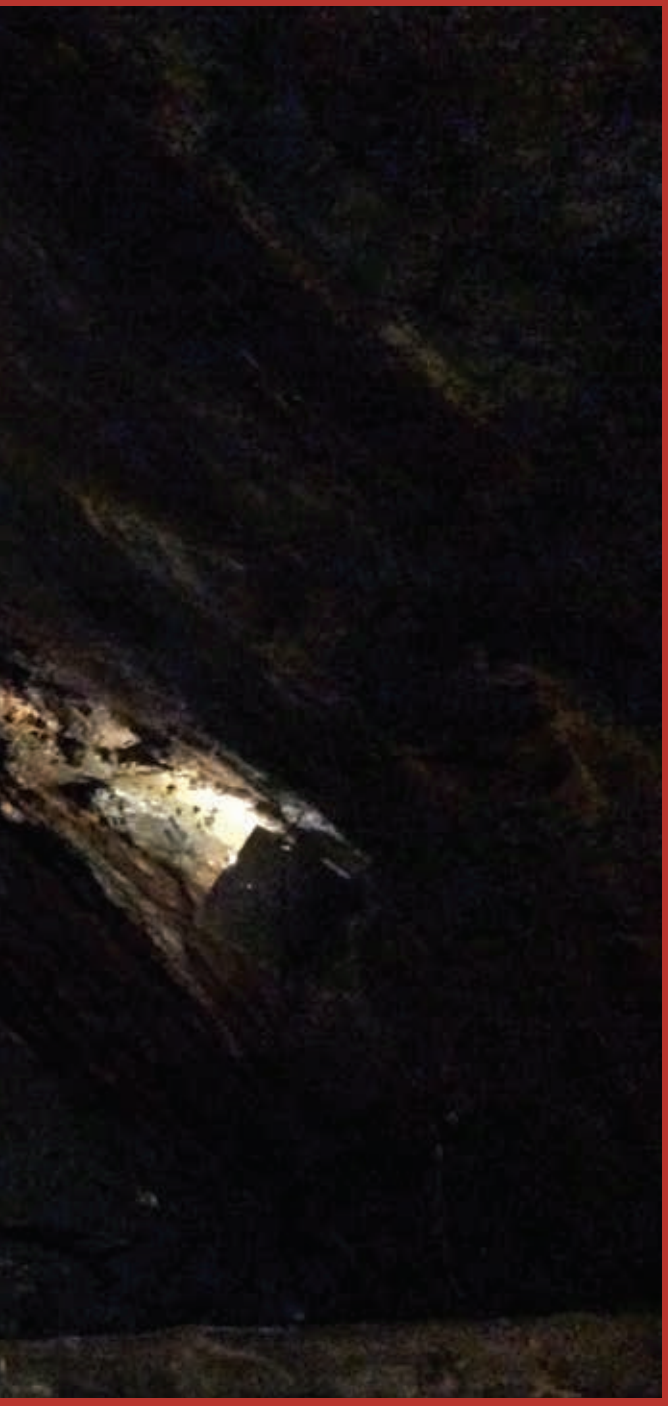
1.3 OBJECTIVE

The objective of this book is to start a public discourse on just transition in India that is built on ground-level experiences. Through an in-depth case study of Ramgarh, one of India's top coal mining district's in the state of Jharkhand, the book aims to provide an understanding of what just transition means for India. Is it just a question of transition of coal mining workers, or does it call for a broader economic transition of these regions through an inclusive planning process? What are the elements of justice that just transition in the context of India must fundamentally rely on? The study explores these dimensions through literature review, analysis of secondary data, and extensive primary survey.

The book finally attempts to outline a framework for just transition, identifying its key components and determinants. However, this is only the beginning. Further in-depth work is required to capture the diversity in coal mining districts and to develop various policies, strategies, and investment plans to make just transition a reality.

CHAPTER 2

JUST TRANSITION DISCOURSE



Chandra Bhushan, iFOREST

- The experience of closing down of coal mines in the global North has been largely triggered by unprofitability of the coal industry.
- In the global North, just transition is largely about restructuring the formal economy and creating alternatives for formal coal mining workers.
- A successful just transition process has to be inclusive, long-term, and will require significant investments.
- Since the Paris Agreement, many developed countries have announced coal phase-out plans; 33 national governments are members of Powering Past Coal Alliance.

Taking into account the imperatives of a just transition of the workforce and the creation of decent work and quality jobs in accordance with nationally defined development priorities.

—Paris Agreement [preamble, para 10], United Nations

2.1 OVERVIEW

The inception of the just transition concept was in the United States (US) in the 1970s and has been widely attributed to Tony Mazzocchi, a trade union leader who worked on occupational safety and health at the Oil, Chemical and Atomic Workers' Union (OCAW).[1] In the early 1990s, he asked for a superfund for workers displaced by environmental protection policies. In 1995, the president of OCAW laid out the proposal of the superfund. Within the next two years, several US and Canadian unions endorsed the just transition principle.[2]

Given its roots, some of the most prominent framings of just transition come from labour unions, with a strong underpinning of 'labour environmentalism'.[3] For example, the International Trade Union Confederation (ITUC) notes that just transition is "*an economy-wide process that produces the plans, policies and investments that lead to a future where all jobs are green and decent, emissions are at net zero, poverty is eradicated, and communities are thriving and resilient*".[4] The International Labour Organisation (ILO) further specifies that just transition "*should not be reduced to welfare… and needs dedicated and holistic policy approaches*".[5]

However, over the years, a growing engagement of various stakeholder groups in the discourse has brought in transformative ideas. As has been very aptly described by the Climate Justice Alliance, "*just transition is a vision-led, unifying and place-based set of principles, processes, and practices that build economic and political power to shift from an extractive economy to a regenerative economy.*"[6] The fundamental idea is that a healthy economy and a clean environment can and should co-exist.[7]

Just transition, in all its framing, therefore, is both constructive and inclusive. With its recognition of the need to decarbonise the economy, while insisting that coal-industry workers and communities in coal mining areas should not become the victims of the de-carbonisation process, it balances the obligations of climate action and social justice. It seeks to build an equitable and resilient economy leading to an improved quality of life for all.

This philosophy is also reflected in the 2030 Agenda for Sustainable Development adopted by the United Nations (UN) General Assembly in October 2015. Three Sustainable Development Goals (SDG) provide the impetus for a fair transition from fossil fuels, balancing the needs of secure and affordable energy, full and productive employment, and sustainable use and management of resources. These include[8]:

- SDG 7: Ensure access to affordable, reliable, sustainable, and modern energy for all,
- SDG 8: Promote sustained, inclusive, and sustainable economic growth, full and productive employment and decent work for all, and;
- SDG 15: Protect, restore, and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.

Just transition discourse at UNFCCC

1997: The ITUC included proposition of just transition in its statement to the Kyoto Conference.

2007-2009: Ahead of the Bali Conference in 2007, trade unions raised the issue of employment. In 2009, a statement on just transition was submitted to the COP15 held in Copenhagen.

2010: Included in the final agreement of COP16 held in Cancun. The agreement notes, "*climate change requires a paradigm shift towards building a low-carbon society that offers substantial opportunities and ensures continued high growth and sustainable development, based on innovative technologies and more sustainable production and consumption and lifestyles while ensuring a just transition of the workforce that creates decent work and quality jobs*". [Article I, Para 10].

2015: Just transition gets included in the preamble of the Paris agreement, COP21. The preamble notes that the parties to the agreement shall respond to the urgent threat of climate change "*Taking into account the imperatives of a just transition of the workforce and the creation of decent work and quality jobs in accordance with nationally defined development priorities*" [Para 10].

2018: The 'Solidarity and Just Transition Silesia Declaration' adopted during the Katowice Conference, COP24, signed by the Polish presidency of the Katowice COP, along with 52 Head of States and Governments from across the world. The Declaration underscored that just transition of the workforce and the creation of decent work and quality jobs are crucial to ensure an effective and inclusive transition to low greenhouse gas emission and climate resilient development.

2.2 FROM KYOTO TO KATOWICE

Just transition was brought into the climate policy platform in 1997, with the ITUC including a demand for a just transition in its statement to the Kyoto Conference. Over the next two decades, the idea was highlighted continuously and advocated by various trade unions (particularly of the global North) and found mention in key climate change deliberations (*see Box: Just transition discourse at UNFCCC*).[9]

However, what has been missing since the Paris Agreement and the Katowice Conference, is a clear inclusive pathway to operationalise just transition within the UNFCCC framework. The Katowice COP was considered an opportunity to build the international community's attention on the justice dimensions of climate mitigation and adaptation. But it exposed the gap between the understanding of climate policymakers of just transition and the complex and multifaceted ground reality that "lie deep in the everyday experiences of workers and frontline communities."[10] Therefore, much is left to be done at the UNFCCC to make the transition process inclusive and collective.

2.3 JUST TRANSITION IN GLOBAL NORTH

In the last few years, just transition has gained traction in the global North with several developed economies pledging to phase out coal over the next two decades and developing coal phase-out strategies, along with just transition plans. For this, policy initiatives and actions are being undertaken individually by governments as well as through alliances. With respect to country-level initiatives, some critical examples come from Canada, Germany, and Spain.

In 2016, Canada announced that it would phase out traditional coal-based power by 2030. In April 2018, the government also launched a 'Task Force on Just Transition for Canadian Coal Power Workers and Communities' to better understand the impacts of phasing out coal and the support required for those affected.[11] Members of the task force visited four mining provinces, interacted with all potentially affected stakeholders, and developed recommendations for a sustainable transition away from coal. The task force highlighted certain key elements

for just transition centered around six pillars/principles. Overall, they emphasised the importance of sound policies and planning that takes the local context into account and engages the local community in the process.[12]

Similarly, in 2018, Germany appointed a dedicated agency called 'Commission on Growth, Structural Economic Change, and Employment' to recommend concrete measures and timelines that can enable the country's energy sector to achieve its emissions reduction targets by 2030, as well as provide a blueprint for just transition of the coal workers and mining regions. The Commission was entrusted to suggest job creation prospects, economic policy instruments, required investments in regions and economic sectors to support structural change. The Commission recommended a roadmap for coal phase-out by 2035 or latest by 2038, which was accepted by the German cabinet in January 2020.[13]

In 2018, Spain proposed a just transition deal that replaced coal industry subsidies with a sustainable development plan for the regions where coal mining was proposed to be closed. The deal- 'Plan del Carbón' - was struck between the Spanish government and the mining unions, following a plan to close all economically unviable coal mines (privately owned). The deal involved a 250 million euro plan for five years (2019-2023) to train and retrain the people who lost their job from mine closures, provide for early retirement, sustainably restore former mining sites, recover forests, improve utility infrastructure, and upgrade facilities in the mining communities including facilities for waste management, recycling, and water treatment.[14]

Just transition is also being facilitated through several coalitions and alliances. In 2017, the United Kingdom and Canada founded the Powering Past Coal Alliance (PPCA) to accelerate the transition from traditional coal-fired electricity to clean energy. The target year for such transition has been set as 2030 for Organisation for Economic Cooperation and Development (OECD) countries, and for all countries, it is 2050. As of May 2020, the alliance had 104 members, comprising 33 national governments, 28 sub-national governments, and 43 businesses largely from North America, South America, Europe, and to a lesser extent, from Africa.[15] The largest coal-economies, including China, the USA, Australia, and India, have, however, shied from joining this alliance.

The European Commission also launched 'The Coal Regions in Transition' initiative in 2018 with a similar objective as PPCA for its member states. At present, 20 coal regions spread across nine EU countries are actively participating in the initiative.[16] In January 2020, the European Commission further adopted a proposal of creating a just transition fund to facilitate this initiative. The fund will support workers and encourage companies and regional authorities to make investments that can enable such a transition.[17]

However, the idea of just transition has not gained much prominence in the major coal-dependent countries of the global South. The dichotomy of jobs versus the environment is still dominant in these economies due to their high reliance on coal. Further, the discourse on the right to development, the growing energy demands, and arguments of low share of greenhouse gas emissions have obstructed discussion around just transition.[18] However, 18 countries of the global South are signatories of the Declaration on just transition adopted in Katowice in 2018. Two of the biggest coal economies, India and China, though are not parties to the Declaration.[19]

2.4 LESSONS FROM THE PAST

Many of Europe's just transition strategies build on experiences of past coal mine closures in different European countries. These experiences demonstrate the advantages of planned mine closures by developing appropriate policies and social dialogue and the disadvantages of unplanned mine closure. In this section, we review three prominent examples to understand what well-planned coal mine closure entails and the repercussions of poor closure practices.

2.4.1 The Dutch experience

One of the earliest examples of a planned approach to mine closure comes from the coal mines in Limburg, The Netherlands. From the end of the 1950s, the Dutch government started to realise that coal mining in the region was becoming a loss-making business because the cost of imported coal was getting cheaper. In 1965, the decision to close down coal mines in the region by 1974 was announced. The announcement was well thought out to minimise the shock of closure on the workers and the local community. For instance, a year before the announcement, the government planned some strategic actions, including

plans to not open any new mine pit, close the small pits, set import restrictions on coal from non-European Coal and Steel Community (ECSC) countries, and allow mining companies to pay lower social welfare contributions to the state to give the industry some relief.

The bigger question for the government was finding suitable alternatives for the estimated 75,000 mining job losses, which accounted for more than 36% of all jobs in the region at the time. Also, there were concerns about addressing the social problems that might coincide with such job loss. As mines were to close in the region by 1974, the government had only 10 years to act on this.[20]

To deal with the employment issues, the government focused on creating jobs through an overall industrial restructuring of the South Limburg region. Some of the key measures included attracting industries by giving subsidies, creating employment finding agencies, and retraining workers in various prospective sectors such as metal, textile, chemical, and other small-scale industries. In 1975, the Limburg Investment and Development Fund (LIOF) was created to actively support economic transformation and attract new companies.[21]

Besides creating jobs through various industries and businesses, an early retirement scheme was also floated for the workers. Offices for national public services (such as taxes, pension funds, etc.) were moved to the region to ensure social stability.

But the plans did not all turn out to be a win-win. As recession hit the region between 1972-78, unemployment rose. Simultaneously, issues also surfaced with the centralised control of the coal mine closure and economic transition process. There were also apprehensions about the re-training of the workforce, as a significant proportion of them were above the age of 40, and most of the new industries required people below or in their 30s. Social infrastructure support for the region also proved to be inadequate.[22]

The Dutch government went back to the drawing board and focused on a more regional approach to revive the economy and gave more freedom to provincial governments to develop their own regional policy. Limburg's provincial government took the lead in developing projects that were intended to create jobs in the short run and provide long-term stability. Regional business clusters were planned and spending on transportation infrastructure was scaled up to improve connectivity. Besides significant investments were made for knowledge and education infrastructure. The local government worked closely with the national government and trade unions, and by 1990, the region attained an unemployment rate equal to the national average.[23]

2.4.2 The South Wales experience

The case of Wales, United Kingdom (UK) also provides an essential insight into the consequences of following a top-down approach.

South Wales was one of the UK's most important iron and coal industry areas since the early 1800s. Around 1913, at the peak of its coal production, the region produced about 57 million tonnes of coal (one-fifth of UK's coal production at that time) and engaged quarter-million people. With the boom and bust episodes following World War II, the coal industry finally experienced a major setback in the 1980s.[24]

In 1984, the government led by Margaret Thatcher announced the closure of 20 mines, which would cost over 20,000 jobs. In its decisions and plans, the government sidelined the labour unions in Wales, which undermined the scope of engaging in a social dialogue with mine workers. Decisions were left to businesses and the government to economically reform the region once coal mines closed. The government brought in policies to encourage foreign direct investments (FDI) in manufacturing. However, this failed to secure adequate income for the local people who lost their jobs due to mine closure. As the supply of low wage labour became the selling point for attracting FDI in Wales, it became a race to the bottom for hiring low-paid workers. Moreover, when these new entities found even cheaper labour overseas, they moved their FDI elsewhere. The erstwhile coal mining regions in Wales, therefore, today have high unemployment, poverty, and net outmigration of workers.[25]

2.4.3 The German experience

The closure of coal mines in Germany's Ruhr valley is considered one of the most comprehensive and planned approaches to mine closure with minimum economic and social fallouts. The mines in the Ruhr valley of Western Germany had been the bedrock since the country's industrial revolution. Coal mining and heavy industry in the region, such as steel, made it the heart of the European Coal and Steel Community. It was also a significant employer

Ruhr coal mine museum/ Creative Commons

in the region, and in 1957 (recorded as the peak of the industry), it directly employed 607,300 people. However, as in the Netherlands, coal mining started to become unprofitable, and reliance on government subsidy increased to keep the industry viable. During this time (1968), through an agreement between the federal government, unions, and business, the mines were consolidated under a single mining corporation, the Ruhrkohle AG (later known as RAG). Long-term plans started to be put in place to close the industry. By 2018, the last mine in Ruhr was closed down - exactly 50 years after the plan was mooted.

What became unique about the complete closing down of coal mines in the region was that it did not lead to unemployment as typically suspected. Instead, the Ruhr experience showed how a coordinated effort of supportive policies, economic diversification, collective bargaining, and social partners' support can successfully reshape the regional economy with no forced job losses.[26] A well-established process of social dialogue between different stakeholders also helped in this.[27]

In terms of downsizing the workforce and economic diversification, a mix of policy and financial instruments were used. For instance, a comprehensive agreement was signed to guarantee a socially responsible approach to the restructuring process. The workers had a significant role in facilitating this. The government's Mining Codetermination Act (1951) gave the workers a voice equal to industrialists. The workforce agreed to forgo a wage increase, and a work redistribution programme was introduced.[28] At the same time, much emphasis was placed on retirement programmes, especially early retirements. This was developed based on the transition payments system for coal industry employees that state legislators had introduced in 1972. For those who were not entitled to the transition payments system, a specific

social compensation plan was created in 2012 under the 'Agreement on the closure of the Ruhr coal industry by 31 December 2018'.[29] The German government also passed the Hard Coal Financing Act in 2007 to phase-out hard coal mining subsidies in the country by 2018 and protect every worker older than 42 years against unemployment.[30]

Several macroeconomic policies were also brought in by the government. For example, in 1984, the State of North-Rhine Westphalia changed its industrial policy, focusing on environmental technology. This led to the growth of Ruhr as a center of environmental technology research in Germany. The policy also encouraged suppliers of equipment to the coal mining, power generation, and steel industries to invest in environmental technology and renewable energy systems. Today these activities make up about two-thirds of their turnover. Besides, large-scale investments were made in infrastructure development, education, technology and innovation, vocational training, and re-skilling to support and improve employment opportunities.

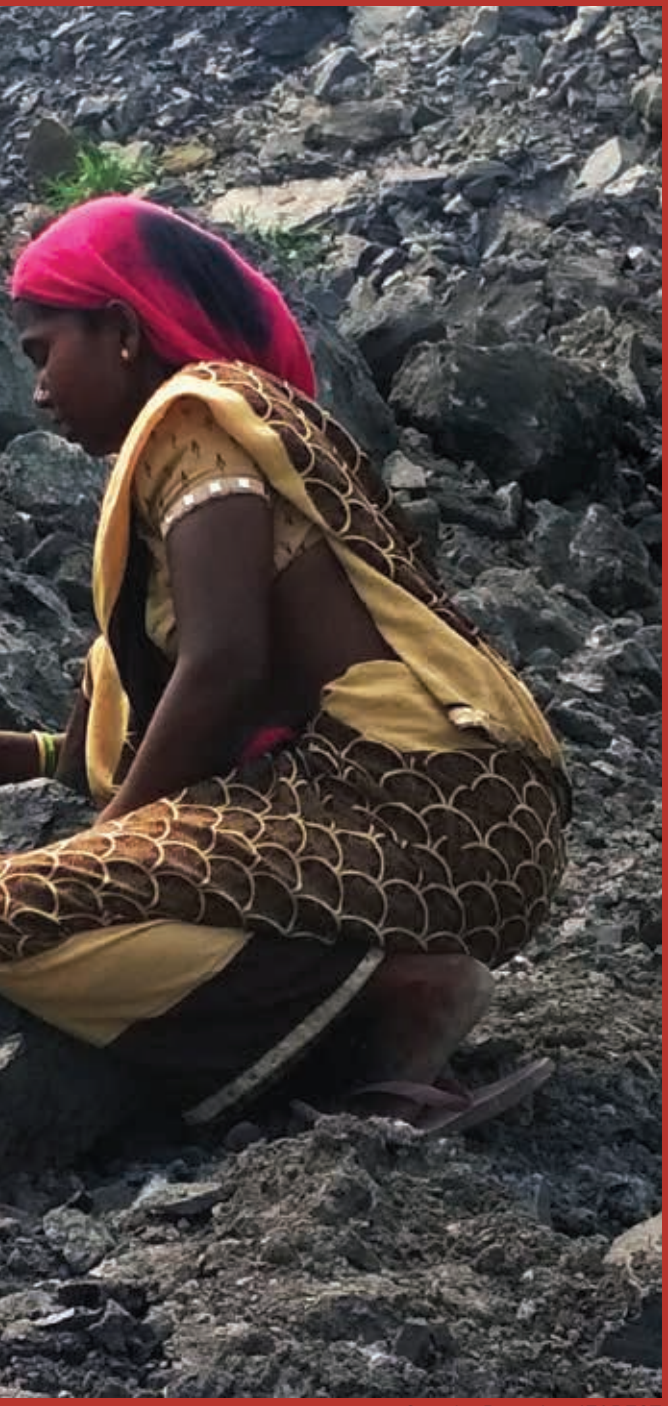
In 2018, around the time of closing the last coal mine in Ruhr, the German government created a Special Commission on Growth, Structural Economic Change and Employment. The Commission had to provide the government concrete prospects for new jobs with promising future, develop and advise on a mix of economic policy instruments and investments required to shift towards a carbon-neutral economy.[31]

The three mine closure experiences discussed above offer crucial learnings on how a just transition must be planned and executed. They show that just transition process has a significantly long gestation period, and therefore long-term planning is essential. They also show that the national government's engagement in developing policies early-on is crucial for facilitating a well-planned transition. At the same time, they also underscore the vital role of the regional and local governments to successfully implement policies and transition measures. And finally, the workers and local communities must be engaged in the process so that the measures are inclusive and tailored to the local context.

But it is also essential to recognise that the above experiences are mostly a result of unprofitable coal mines. This is partly applicable to the coal industry in countries like India. Coalfields in some districts are becoming unprofitable and hence are closing down. But overall, coal mining remains a profitable venture. Also, the socio-economic situation in developed countries is very different than a developing one. Therefore, a just transition framework for socio-economically backward regions of a developing country with profitable as well as unprofitable coal mines will have to be conceptualised differently, keeping in mind the developed countries' learnings.

CHAPTER 3

COAL MINING IN INDIA



Srestha Banerjee, iFOREST

- India is the second largest producer and consumer of coal in the world. With an estimated resource of 326.5 billion tonnes, it the most abundant fossil fuel in the country.
- Nearly 15 million people are dependent on coal directly and indirectly for employment and income.
- Coal mining is overall a profitable industry. But almost 70% of mines of Coal India Limited, India's largest coal producer, are running into losses, raising questions about the future of the coal industry.
- With a target of 1 billion tonnes of coal production by 2024, the Government has opened up commercial coal mining to the private sector.

Allowing private sector in commercial coal mining is unlocking resources of a nation with the world's fourth largest reserves.

—Narendra Modi, PRIME MINISTER OF INDIA

3.1 OVERVIEW

Coal has been intricately linked to India's economic, social, and environmental milieu for decades. Most historical documents record that commercial coal mining started in 1774 when Sumner & Heatly of the East India Company began mining in the Raniganj coalfields.[1] Over the next 250 years, India's coal history has moved along with its political and economic history; from the British Raj, the post-independence era, nationalisation in the 1970s, to the re-introduction of commercial mining by private players in 2020.

Coal is viewed as the backbone of India's industrial and energy security. It is the primary source of the country's electricity, supplies fuel to various industrial sectors, cross-subsidises Indian Railways, and is a major employment generator in key mining and industrial areas. However, at the same time, coal geography has been fraught with challenges of environmental degradation, resource exploitation, and social alienation. This chapter outlines the coal scenario in India in the context of economic, social, and environmental issues and evaluates whether India is at a juncture when a just transition discourse can begin.

3.1.1 Resources and Reserves

India has an estimated 326.5 billion tonnes (BT) of coal resources, making it the most abundant fossil fuel available.[2] Out of this, 47.6% (nearly 155.6 BT) are proven resources.[3] In terms of reserves, the country has 97.7 BT of coal reserves and ranks fifth in the world after United States, Russia, Australia, and China.[4]

In India, coal is mainly concentrated in five states - Jharkhand, Odisha, Chhattisgarh, West Bengal, and Madhya Pradesh, which collectively have about 279.3 BT of resources, approximately 85% of the total resources in the country.[5] Jharkhand tops the chart with more than 25.5% of India's total coal resources.

Table 1: Type and category-wise coal resources (BT)

Coal type	Proved	Indicated	Inferred	Total
Prime coking	**4.7**	**0.7**	**0.0**	**5.3**
Medium coking	**14.9**	**11.3**	**1.9**	**28.0**
Semi coking	**0.5**	**1.0**	**0.2**	**1.7**
Non coking	**135.0**	**127.5**	**27.4**	**289.9**
Tertiary coal	**0.6**	**0.1**	**0.9**	**1.6**
Grand total	**155.6**	**140.5**	**30.4**	**326.5**

Source: Ministry of Coal, Annual Report, 2019-20

Table 2: Coal resources in top five states (BT)				
State	Proved	Indicated	Inferred	Total
Jharkhand	**45.5**	**31.4**	**6.2**	**83.2**
Odisha	**37.4**	**34.2**	**7.7**	**79.3**
Chhattisgarh	**20.5**	**34.6**	**2.2**	**57.2**
West Bengal	**14.2**	**12.9**	**4.6**	**31.7**
Madhya Pradesh	**11.9**	**12.2**	**3.9**	**27.9**
Total	**129.5**	**125.2**	**24.6**	**279.3**

Source: Ministry of Coal, 2019

Table 3: State-wise raw coal production (MT)						
State	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20*
Assam	**0.8**	**0.5**	**0.6**	**0.8**	**0.8**	**0.3**
Chhattisgarh	**134.8**	**130.6**	**138.5**	**142.6**	**161.9**	**116.1**
Jharkhand	**124.1**	**121.1**	**126.4**	**123.3**	**134.7**	**98.5**
Madhya Pradesh	**87.6**	**107.7**	**105.0**	**112.1**	**118.7**	**103.4**
Maharashtra	**38.3**	**38.4**	**40.6**	**42.2**	**49.8**	**37.5**
Meghalaya	**2.5**	**3.7**	**2.3**	**1.5**	**0.0**	**0.1**
Odisha	**123.6**	**138.5**	**139.4**	**143.3**	**144.3**	**105.2**
Telangana	**52.5**	**60.4**	**61.3**	**62.0**	**65.2**	**53.8**
Uttar Pradesh	**15.0**	**12.7**	**16.1**	**18.3**	**20.3**	**14.8**
West Bengal	**30.0**	**25.8**	**27.7**	**29.2**	**33.1**	**25.6**

Source: Provisional Coal Statistics of Coal Controller's Organisation; and Lok Sabha Starred Question No. 350 dated November 27, 2019; *up to Jan 2020

3.1.2 Domestic Production and Imports

India ranked second in global coal production after China, accounting for about 9.5% of the global production (coal and lignite) in 2017.[6] As per the latest estimates of the Government of India, coal production in 2019-20 was 729.1 million tonnes (MT).[7]

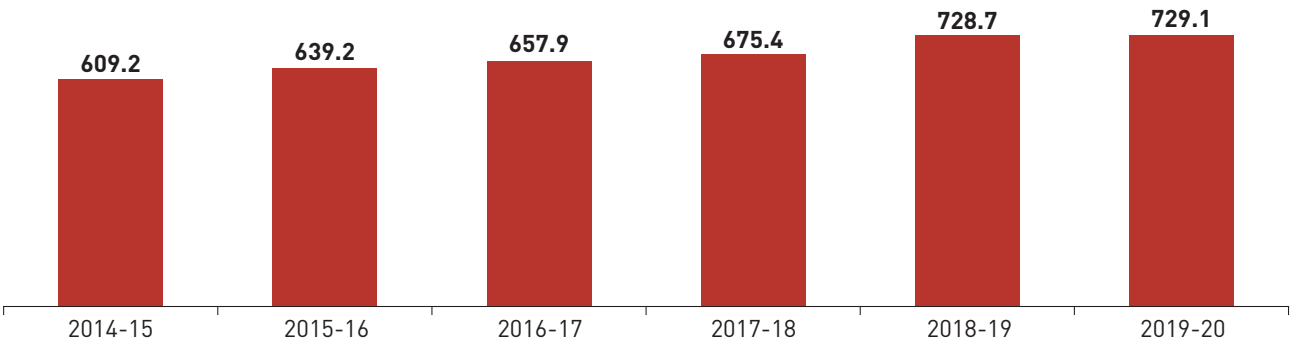
Raw coal production is primarily concentrated in four states – Odisha, Chhattisgarh, Jharkhand, and Madhya Pradesh. These states collectively accounted for nearly 80% of the total production in 2019-2020 (estimates up to January 2020). Other key coal-producing states are Telangana, Maharashtra, and West Bengal.[8]

The production of coal has been steadily increasing in recent years. In the past decade, between 2009-10 to 2019-20, production has grown at a compound annual growth rate (CAGR) of 3.2%, with total production increasing from 532 MT in 2009-10 to 729.1 MT in 2019-20.[9] The Government of India has further set a target of reaching one BT of production by 2023-2024, which would require the production rate to increase to 8.2% per annum during the next four years (*see Figure 1: Coal production, p30*).[10]

India's coal imports have also increased alongside production. This is primarily to bridge the demand-supply gap for various industrial sectors (*see Table 4: Coal demand and supply, p30*).[11] The bulk of the imports include non-coking coal for use by industries such as thermal power plants, cement, and sponge iron plants. Coking coal is primarily imported by the Steel Authority of India Limited (SAIL) and other steel manufacturers (*see Table 5: Category-wise coal import, p30*).[12]

To accelerate domestic production, the central government has recently taken some crucial steps. In March

Figure 1: Coal production (MT)



Source: Annual reports of Ministry of Coal

Table 4: Coal demand and supply (MT)

	2014-15	2015-16	2016-17	2017-18	2018-19
Actual Demand	**766.4**	**832.9**	**836.9**	**898.3**	**968.0**
Domestic Supply	**609.2**	**639.2**	**645.9**	**690.0**	**732.8**
Imports	**217.8**	**203.9**	**190.9**	**208.3**	**235.2**

Source: Annual reports of Ministry of Coal

Table 5: Category-wise coal import (MT)

	2014-15	2015-16	2016-17	2017-18	2018-19	2019-2020
Coking coal	**43.7**	**44.6**	**41.6**	**47.0**	**51.8**	**51.8**
Non coking coal	**174.1**	**159.4**	**149.3**	**161.3**	**183.4**	**196.7**
Total imports	**217.8**	**204.0**	**191.0**	**208.3**	**235.2**	**248.5**

Source: Ministry of Coal, June 2020

2020, India enacted the Mineral Laws Amendment Act 2020, which amends the Coal Mines (Special Provisions) Act, 2015 (CMSP Act). A key focus of the amendment is to attract private players (including foreign companies) for commercial coal mining.[13] In May 2020, the central government further announced an investment of ₹50,000 crores (US $7 billion) to build coal transportation infrastructure.[14] The government has also earmarked substantial amounts to shore-up coal and lignite exploration. For 2020-21, a sum of ₹700 crores (US $97 million) have been budgeted towards this. As per sources, the government assumes that this will boost investor confidence and private investments in coal mining.[15]

3.1.3 Consumption and Demand

Over the past decade, raw coal consumption has increased from 587.8 MT during 2009-10 to over 968 MT during 2018-19, with a CAGR of 5.7%. Nearly 66% of raw coal consumption is for power generation. Other key industrial sectors consuming coal include iron and steel, sponge iron, and the cement sector.[16]

3.1.4 Trends in the power sector

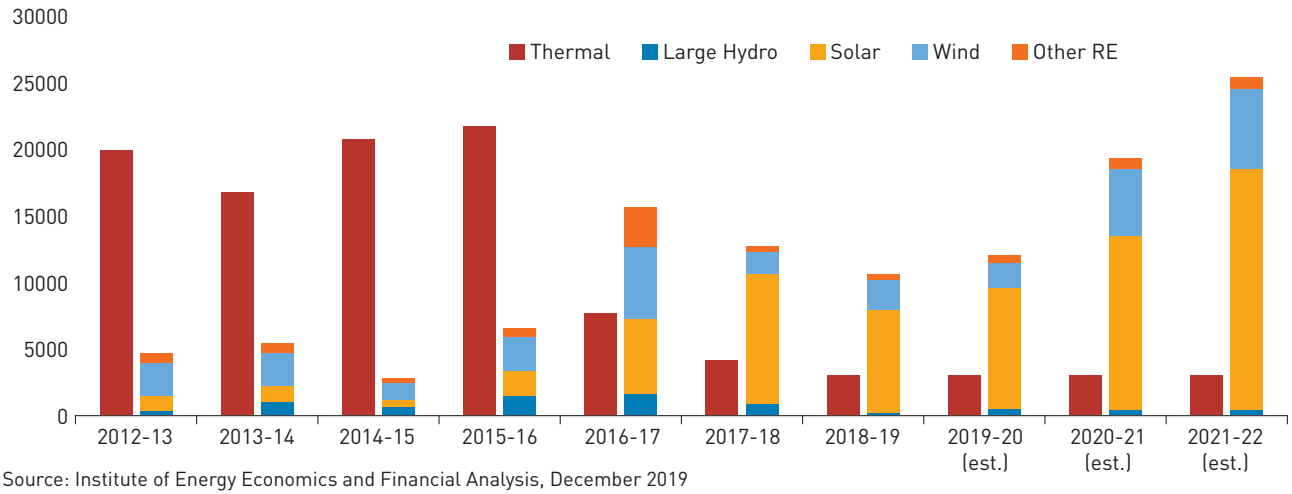
Coal-based thermal power accounts for more than half of installed power generation capacity. As of August 2020, coal-based power accounted for 55.3% of the total installed

Table 6: Sector-wise coal consumption (MT)

Year	Electricity	Steel & Washery[a]	Cement	Paper	Textile	Sponge Iron	Fertilizers & chemicals	Bricks	Others[b]	Total
2009-10	**390.6**	**43.3**	**14.7**	**2.3**	**0.3**	**23.1**	**3.2**	**0.5**	**109.9**	**587.8**
2010-11	**395.8**	**38.1**	**15.1**	**2.4**	**0.3**	**22.8**	**3.5**	**0.3**	**114.8**	**593.0**
2011-12	**410.4**	**47.9**	**13.2**	**2.0**	**0.3**	**21.7**	**3.2**	**0.1**	**140.0**	**638.7**
2012-13	**446.8**	**51.7**	**31.1**	**2.1**	**0.3**	**20.9**	**2.9**	**2.0**	**173.6**	**731.4**
2013-14	**449.0**	**53.1**	**11.9**	**1.9**	**0.4**	**18.5**	**2.6**	**4.0**	**198.0**	**739.3**
2014-15	**497.7**	**56.2**	**11.4**	**1.7**	**0.4**	**17.8**	**2.7**	**0.1**	**234.2**	**822.1**
2015-16	**517.8**	**57.1**	**9.0**	**1.2**	**0.3**	**7.8**	**2.6**	**0.1**	**241.0**	**836.7**
2016-17	**535.0**	**52.0**	**6.4**	**1.2**	**0.2**	**5.6**	**2.5**	**0.1**	**234.3**	**837.2**
2017-18	**585.5**	**58.5**	**7.7**	**1.5**	**0.2**	**8.5**	**2.2**	**0.1**	**234.3**	**898.5**
2018-19(P)	**638.0**	**69.5**	**8.8**	**1.6**	**0.2**	**12.2**	**2.0**	**0.1**	**235.8**	**968.3**
Share (%)	**65.9**	**7.2**	**0.9**	**0.2**	**0.0**	**1.3**	**0.2**	**0.0**	**24.4**	**100.0**
CAGR (%)	**5.0**	**4.9**	**-5.0**	**-3.5**	**-2.8**	**-6.2**	**-4.4**	**-15.4**	**7.9**	**5.1**

Source: Ministry of Statistics and Programme Implementation, 2020; (a) includes imported coking coal; (b) includes imports of non-coking coal

Figure 2: Thermal power versus renewable capacity additions (MW)



Source: Institute of Energy Economics and Financial Analysis, December 2019

capacity of grid-connected power plants.[17] The electricity generation from coal power plants was about 71.3% of the total generation in 2019-20.[18] However, coal power's dominant role has started to diminish mainly due to slow growth in electricity demand and reduced cost of renewable energy (RE).

The Government of India's ambitious target to create 175 gigawatts (GW) of RE capacity by 2022 has given the necessary policy momentum to the RE sector and helped build investor confidence and interest in it. On the other hand, environmental concerns, notably air pollution, have also started to make coal-based thermal power plants less attractive to the private sector.

Over the past few years (since 2016-17), capacity additions in renewable energy have steadily surpassed any new capacity addition in thermal power. Projections by the Central Electricity Authority (CEA) show that RE will have an increasingly dominant role in the power sector.[19]

The CEA has projected a significant reduction in coal-based power installation and generation capacity over the next 10 years. Their recent report (2020) deals with an optimal generation capacity mix in 2029-30 that is cost-effective and environmentally friendly. The report, which includes various input factors to determine the optimal capacity mix, including battery storage systems, observes that the capacity expansion for coal-based plants will not be significant compared to the solar and wind capacity addition in 2029-30. In fact, in 2029-30, the percent share of renewables in the total installed capacity will be nearly twice of coal and lignite-based sources.[20]

What is additionally noteworthy is the increase in the share of renewables in gross electricity generation. While renewable energy's share in total installed capacity is currently about 21%, its share in gross generation remains only about 9%. This is due to several reasons, including grid capacity, issues with storage systems, etc. As per the CEA, in 2029-30, the share of renewables (combining solar, wind, hydro, and biomass) will be 44% in gross electricity generation, factoring in the reduction of the price of battery energy storage system and solar.[21]

Table 7: Technology-wise estimated installed capacity by 2029-30

Fuel Type	Capacity (MW)	Composition (%)
Coal + Lignite	**266,827**	**32.1**
Gas	**24,350**	**2.9**
Nuclear	**16,880**	**2.0**
Solar	**300,000**	**36.1**
Wind	**140,000**	**16.8**
Biomass	**10,000**	**1.2**
Hydro	**73,445**	**8.8**
Total	**831,502**	
Battery Energy Storage	**34,000MW/136,000MWh**	

Source: Central Electricity Authority, 2020

Overall, while the share of coal in India's electricity mix is projected to reduce significantly in the next decade, the amount of CO_2 emissions is projected to increase slightly, from 1,026 MT in 2021-22 to 1,154 MT in 2029-30, given the country's total coal demand.[22]

3.2 THE COAL ECONOMY

3.2.1 GDP and Revenue

The overall contribution of the mining sector to India's GDP is 2%, while the share of coal and lignite is only about 0.7%.[23] Though the share of coal in the overall GDP is not significant, the taxes and levies from it constitute an important revenue source for the state and the central governments.

A major revenue source is Coal India Limited (CIL), the biggest state-owned coal mining company. Between 2013-14 to 2017-18, the central government had earned ₹2.03 lakh crores (US $28 billion) as revenue from CIL. Given that CIL produces 83% of India's coal (as per the latest estimates of the Ministry of Coal, 2019-20), the total revenue from all coal mining companies will be higher. In the largest coal-producing states of Jharkhand and Chhattisgarh, coal assumes an even more important role, with an estimated share of 10% and 9% in the state's revenue.[24]

Another important source of revenue for the government is the Indian Railways. The sector is highly dependent on coal transportation for revenue generation. Coal constitutes about 44% of Indian Railways' freight revenue and an even higher share of its profits. This outcome is the result of a deliberately adopted business model that subsidises

Table 8: Revenue paid by CIL to central government

Year	Revenue paid by CIL (₹ crore)
2013-14	**19,713.5 (US $2.7 billion)**
2014-15	**21,482.2 (US $3 billion)**
2015-16	**29,084.1 (US $4 billion)**
2016-17	**44,068.3 (US $6 billion)**
2017-18	**44,046.6 (US $6 billion)**
2018-19	**44,826.4 (US $6 billion)**

Source: Lok Sabha Unstarred Question dated December 4, 2019

Informal workers in Rajrappa coal washery, Ramgarh/ Srestha Banerjee, iFOREST

passenger fare and overcharges freight. This cross-subsidy model is designed to help the railways fulfill its social obligation as the 'connecting lifeline of the nation' while also being profitable through freight overpricing. Unsurprisingly, this policy adds to the cost of coal-based power in India, estimated to be at least ₹0.10/kWh in 2017 on average, and much higher for power plants far away from coalfields.[25]

3.2.2 Employment

Coal mining is a key source of employment in major coal-producing districts of India. CIL, which produces the lion's share of coal, has manpower of about 0.28 million (277,337 as of December 2019).[26] The NLC India Limited, the largest lignite producing company, has 12,820 people[27], and the Singareni Collieries Company Limited (SCCL) has 48,942 people.[28] Overall, formal employment in coal mines is estimated to be 0.35 million.

The total livelihood supported by coal mines is, however, estimated to be much higher. Considering the high proportion of informal workers, captive coal mine workers, and other indirect dependence, scholars have estimated that, overall, about 15 million people in the coal belt are directly or indirectly dependent on coal for income.[29]

Table 9: Employment in coal mines

Year	Persons employed	Decline in employment from previous year (%)
2000	**458,387**	**NA**
2001	**438,179**	**4**
2002	**422,594**	**4**
2003	**416,767**	**1**
2004	**405,212**	**3**
2005	**398,890**	**2**
2006	**385,705**	**3**
2007	**379,456**	**2**
2008	**369,414**	**3**
2009	**373,950**	**-1**
2010	**371,037**	**1**
2011	**366,037**	**1**
2012	**358,514**	**2**
2013	**357,920**	**0**
2014 (P)	**355,904**	**1**

Source: Ministry of Statistics and Programme Implementation, 2017

But the coal mining sector has been showing a steady decline in formal employment over the past years, mainly due to increased mechanisation. Data shows that between 2000-2014, the sector's labour productivity increased by about 6.6% per year, and simultaneously output increased by 4.9% per year. However, during this period, employment declined by about 1.8% per year.[30]

Outsourcing of coal mining-related activities has also been a factor for the decline in formal employment in CIL and its subsidiaries. Until the 1990s, the Coal Mines Nationalisation Act, 1973, and the Contract Labour (Regulation and Abolition) Act, 1970, had prevented private subcontracting by government coal companies. However, the easing of coal mining laws from the 1990s allowed contractual employment and private subcontractors for mining operations.[31] Scholarly studies and anecdotal evidence suggest that these contractual jobs pay far less, making coal mining work unattractive to the young generation.[32]

The employment in coal mines is projected to reduce further due to increased mechanisation, automation, and outsourcing in the coming years. The decline in coal demand for electricity production and associated market forces will further reduce employment.

3.2.3 Wages and Social Welfare

In terms of income, the wages for the formal workforce in the coal mining sector are typically higher than that available for other local works. In 2016, the highest and lowest average daily minimum wage rate in coal mines was reported at ₹1,613.08 (US $23) and ₹1,063.24 (US $15), respectively. This is substantially higher than minimum daily wages for highly skilled industrial workers, ranging from ₹745-832 (US $11-12). However, in coal mines, workforce participation remains heavily skewed in favour of men, with a workforce composition of 98.4% men and 1.6% women.[33]

The coal public sector undertakings (PSUs), arguably have had a role in the development of the coal regions. The revenue that state governments and districts receive from

Table 10: Profit and loss-making mines of CIL			
Particulars	Underground mines	Opencast mines	Total mines
Profit making mines	**4**	**124**	**128**
Loss making mines	**195**	**97**	**292**
Total	**199**	**221**	**420**

Source: Lok Sabha Unstarred Question No. 3751 dated December 11, 2019

Table 11: Profitability of CIL (₹ crore)			
Particulars	2018-19	2017-18	2016-17
Turnover	**140,603 (US $19.5 billion)**	**126,544 (US $18 billion)**	**122,287 (US $17 billion)**
Net profit	**17,462 (US $2.5 billion)**	**7,038 (US $1 billion)**	**9,362 (US $1.3 billion)**

Source: CIL Annual reports

their operation has facilitated infrastructure investments in these areas.[34] With respect to welfare spending in mining regions, between 2012-13 to 2018-19, CIL has spent about ₹3,313 crores (US $450 million) on various social development activities as part of its Corporate Social Responsibility (CSR) initiatives.[35]

However, the direct welfare benefits of the coal companies are for their employees. These include housing, healthcare, education, water supply, etc.[36] For example, as per CIL records, the company has a network of 69 fully equipped hospitals, 361 dispensaries, 542 ambulances, and 1,070 doctors (including specialists) that provide medical services to the employees and their families. In education, the company's support is more broad-based. CIL currently finances 62 public schools and offers grants-in-aid to 284 privately managed schools.[37]

3.2.4 Profitability

CIL has seen a downturn with many of its operating mines, especially the underground ones, becoming unprofitable. According to a cost sheet prepared by CIL for 420 of its mines (which is more than 90% of its total mines), 70% of them are running into losses. However, overall, CIL remains a highly profitable company, with an average profit margin between 10% and 20% over the past few years.[38]

It is clear from the above discussion that there are some looming questions about the future of the coal economy, especially with respect to the unprofitability of mines. However, the centrality of coal in India's economy, and the position of a major PSU like CIL, cannot be ignored either. Therefore, planning a transition away from the coal economy should be a deliberative process taking into account all aspects and involving all stakeholders.

CHAPTER 4

RATIONALE FOR A JUST TRANSITION

Chandra Bhushan, iFOREST

- The cost of power from utility-scale solar photovoltaic is 20% to 30% cheaper than the cost of power from existing coal plants.
- Coal-based power plants are the single largest source of GHG emissions and industrial pollution in India. Stringent pollution standards is putting a question mark on the viability of many power plants.
- Most of India's coal mining districts suffer from resource curse. More than 50% population in the top coal districts are multi-dimensionally poor, with poor health, education and living standards.
- In top coal states like Jharkhand, 50% of mines are temporarily or permanently closed. There is an urgent need to avoid social and economic disruptions of unplanned mine closure.

Economic growth without investment in human development is unsustainable - and unethical.

—Amartya Sen, ECONOMIST AND NOBEL LAUREATE

4.1 OVERVIEW

Discussing coal in India is generally perceived as off-limits. There lie extreme views on what must be done with coal in the face of energy demand, economic imperatives, environmental concerns and social implications. While on one hand, coal is considered the most important, and least expensive means of meeting the energy needs of the country, on the other extreme, lies the argument of coal being the dirty business. Such views have also precluded the scope of any collective and deliberate policy discussion on the future of coal and the coal mining areas considering the realities of our times.

However, five critical factors must compel us to to discuss coal in its entirety, including the need to plan for a just transition of India's coal mining areas. These include:

- Competitiveness of renewable-based power supply;
- Stringent environmental standards and rising pollution control costs;
- Reversing the resource curse in coal mining areas;
- The urgency of climate action to avoid catastrophic impacts; and,
- Avoiding socio-economic disruptions of unplanned closure.

This section highlights why these factors must be recognised to plan a low-carbon future that is sustainable, secure and equitable.

4.2 COMPETITIVENESS OF RENEWABLES

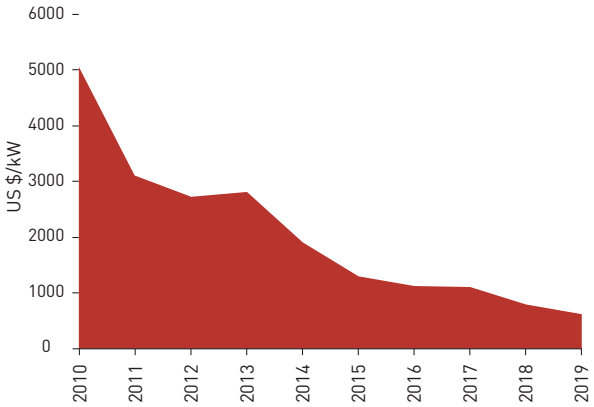
The strongest rationale for using coal has been its lower cost and domestic availability. Given coal's availability and the imperative of 100% electrification at affordable prices, all the externalities associated with coal have been overlooked for long. However, with a steady decline in the cost of renewable energy (RE), especially solar and wind, brought about by innovation and increased deployment, the cost advantage of coal is gradually eroding.

The installed cost and tariffs of utility-scale solar photo voltaic (PV) plants in India have fallen by 85% since 2010, coming down to ₹2.50-3.00/kWh (US $ 0.35-0.45/kWh) by 2019.[1] This is already 20% to 30% cheaper than the cost of power from existing coal plants. This trend is widely expected to continue, with solar power prices expected to fall to around ₹2.00/kWh (US $ 0.025/kWh) or even lower by 2030, while the cheapest pithead coal power price is likely to rise to ₹4.85/kWh (US $ 0.07/kWh) by that time.[2]

The biggest threat to coal power is from uninterrupted renewable energy. This threat is now a reality. In a recent auction to supply round-the-clock electricity from renewable energy with battery storage, the average tariff was ₹4.30/ kWh (US cents 6.1/kWh) – the cheapest renewable-plus-battery storage tariff anywhere in the world. At this tariff, renewable plus battery storage will out-price most new coal-based power plants.[3]

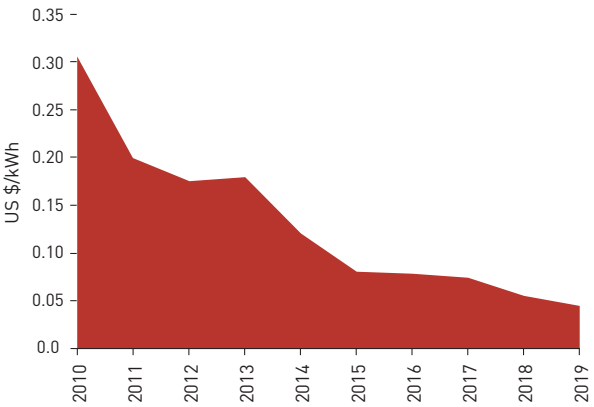
Investors are responding to this reality, and it has become increasingly difficult to finance new coal-based power plants in India. Nearly 50 GW of planned capacity was cancelled in 2019, and many more plants, in the planning stage for years, are not likely to see the light of day.[4] The number of reputed international institutional investors formally declaring an end to coal investment in keeping with Paris Climate goals is growing by the month. If the government-owned Power Finance Corporation (PFC) - the most important investor in coal-based power plants in India – stops funding coal power plants, there would hardly be any significant investments in coal power in the country.

Figure 1: Utility-scale Solar PV-Installed cost



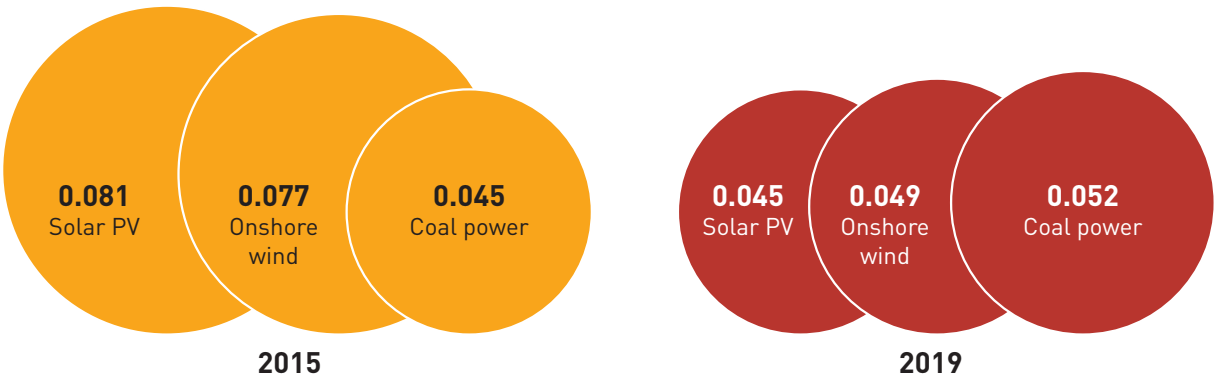
Source: Renewable Power Generation Costs in 2019, IRENA

Figure 2: Utility-scale Solar PV-levelised cost



Source: Renewable Power Generation Costs in 2019, IRENA

Figure 3: Rapidly falling cost advantage of coal-based power in India (US $/kWh)



Source: Renewable Power Generation Costs in 2019, IRENA

4.3 RISING POLLUTION CONTROL COSTS

Both coal-fired power generation and coal mining have several detrimental effects on heath and environment. To reduce these impacts, environmental standards have been progressively made stringent, denting coal power's cost advantage.

4.3.1 Coal power plants

Thermal power plants (TPP) are the largest source of industrial pollution in India. TPPs are a significant source of inorganic particulate matter (PM) emission- mainly ash, along with sulphur dioxide (SO_2), nitrogen oxides (NOx), mercury (Hg), and other trace metals.[5] Of the entire industrial sector, it alone accounts for 60% of suspended particulate matter (SPM) emissions, 50% of SO_2, 30% of NOx, and 80% of Hg emissions.[6] What makes it worse is the inadequate monitoring of pollution parameters and compliance by the industry. As of January 2020, 34 thermal power stations were issued show cause notice for high levels of pollution and non-compliance with emissions standards.[7]

Air pollution from the power plants also has major health impacts, as they disperse to distances as far as 100 kilometers (depending on the wind velocity and direction). Researchers have linked sulphates, nitrates, and fine particulate matter emissions to premature deaths in

populations living near thermal power plants. For example, a study published by the Resources for the Future (2012) suggested that approximately 650 deaths occur per plant in a year with the current emissions level compared to the zero-emission condition. Out of these, the highest proportion of fatalities are related to SO_2 emissions causing approximately 500 deaths, as exposure to SO_2 in the ambient air reduces lung function and causes other serious respiratory ailments.[8]

Besides air pollution, high water consumption by TPPs and water pollution are also significant issues. India's power plants are estimated to withdraw around 22 billion cubic metres of water, over half of India's domestic water demand.[9]

The poor fly ash handling, storage, and disposal systems of TPPs lead to the discharge of ash slurry into water bodies causing water pollution. Nearly 50% of fly ash generated (total generation of about 170 million tonnes per year) remain unutilised and is dumped into poorly designed and maintained ash ponds. Nearly a billion tonnes of these toxic ashes lie in these ponds currently, polluting land, air, and water. Ash dyke breach and the resultant pollution of land and water bodies are quite common in the country.[10]

Coal-based industrial activities, such as coal washeries, coke oven, and soft coke plants, have also been identified by the Central Pollution Control Board (CPCB) as the key contributors to the pollution of ambient air, water, and soil in the coal regions.[11]

Considering the pollution impacts, the standards on industries and power plants have been progressively made stringent. In 2015, the Ministry of Environment, Forest and Climate Change (MoEF&CC) imposed new standards on coal power plants to limit their emissions of SO_2, NOx, PM and Hg. While the TPPs have not met the deadline of December 2017, they have been given a new deadline of 2022 to meet these standards. The estimated capital expenditure required to meet these standards is about ₹86,135 crore (US $12 billion). This will add between ₹0.32 and 0.72/kWh to the existing tariffs (or around 9% to 21% to their average generation tariff) depending on the size of the units and other factors.[12] Many older plants will be forced to close because of the tariff increase.

Going ahead, the pollution standards will become even more stringent to meet the ambient air and water quality standards, putting a question mark on the financial viability of a large number of TPPs.

4.3.2 Coal mining

Coal mining has major impacts on forest and forest-based livelihoods. Coal mining accounts for about half of all the forestland diverted for mining.

Coal mining also generates a large amount of pollution and waste. Coal mines, especially abandoned mines, particularly in old coal mining areas, are a significant source of water pollution owing to the leakage of highly toxic acid (acid-mine drainage) in the ground and surface water. The overburden and waste generated from the mining activities also cause air and water pollution. As a result, coal mining areas are critically polluted in terms of air, water, and soil pollution.[13]

The union environment ministry (now MoEF&CC) in 2010 had identified most of the top coal mining areas as critically polluted areas. These include Hazaribagh and Dhanbad in Jharkhand, Singrauli in Madhya Pradesh, Korba in Chhattisgarh, and Angul-Talcher areas of Odisha, among others. A temporary moratorium was imposed on these areas in 2010, and all new and expansion projects were stopped till an action plan was developed to improve the environmental quality. While the moratorium has been removed, these areas now have to implement short-term and long-term action plans to reduce pollution levels. If they fail to do so, they can be penalised, including the imposition of another moratorium.[14]

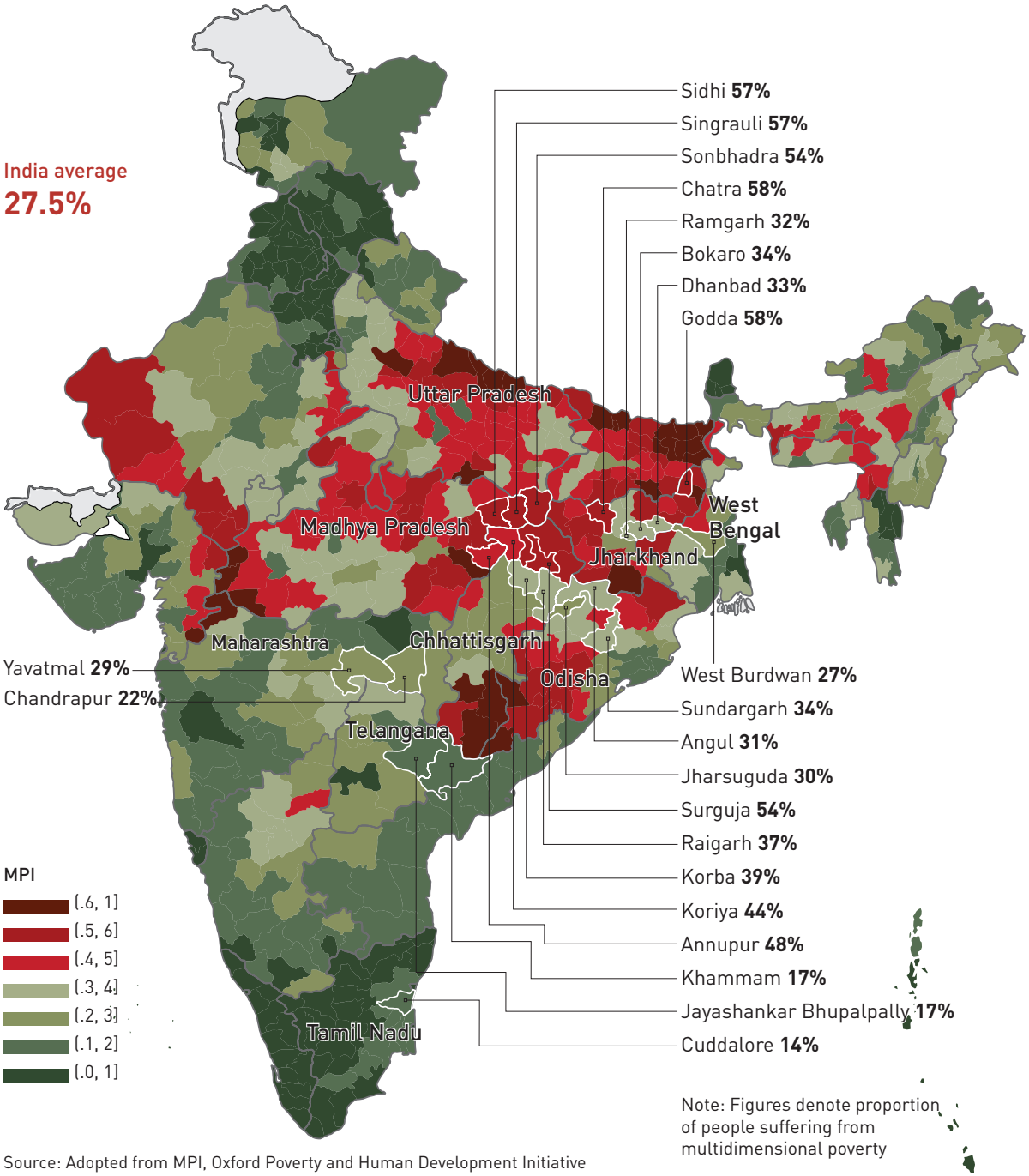
Overall, as the environmental consciousness increases in the country, coal mining and coal-based industries will have to meet the highest levels of environmental norms, making them even more uncompetitive to alternative energy sources like renewables.

4.4 REVERSING THE RESOURCE CURSE

Most of India's top coal mining districts suffer from the classic problem of 'resource curse', where the local people have been facing displacement and deprivation due to resource extraction.

Coal mining has been controversial over the years due to displacement and resettlement issues. Displacement of people from their lands and livelihoods is one of the worst impacts mining-affected communities have had to endure. While the data on displacement is extremely poor,

Map 1: Percentage of multidimensionally poor people in top coal mining districts



Source: Adopted from MPI, Oxford Poverty and Human Development Initiative

Cyclewallah of Ramgarh/Rajeev Ranjan, iFOREST

estimates suggest in the past 40 years, about 87,000 people have been displaced by mining activities of CIL. Further, one out of six people displaced belongs to the *adivasis* or indigenous community.[15] However, the number is a gross underestimation of the reality, as it only includes the people who have lost their lands (and counted as project affected), not the ones that depended on the land for their livelihoods.[16]

Coal mining districts are also economically backward. While coal production from these regions has contributed to the country's growth story, people in these areas have remained impoverished.[17] A review of India's top 22 mining districts, producing at least 10 MT or more coal per year, shows that 50% of the population in most of these districts are 'multi-dimensionally poor,' exhibiting very poor status

of health, education, and living standards. This is nearly twice the India average of 27.5%.[18,19] The average income levels among households are also lower than the India average. If rural household income is considered (since most mines are located in rural areas), the highest-earning member's monthly income is less than ₹5,000 (US $69) among 85% of rural households in coal mining districts; the India average is 74.5%.[20] The low income level suggests that most of them do not have a secure income and are involved in low paid casual labour.

The current socio-economic conditions of coal mining districts are untenable and will have to be reversed to provide jobs and improve living standards of the population. This will require economic diversification and investments in social sectors.

4.5 URGENCY OF CLIMATE ACTION

India is one of the most vulnerable countries to the effects of climate change.[21] In 2018, India's economic losses due to climate change were the second-highest globally, with a loss of ₹2.7 lakh crore (US $37.5 billion), about 0.36% of its GDP.[22] In the same year, a report of the World Bank further noted that climate change will shave-off 2.8% of India's per capita GDP by 2050 and worsen the living standards of half of the country's population under business as usual scenario. In the hotspots of Chhattisgarh, Madhya Pradesh, and Maharashtra, the per capita GDP loss could be as high as 9.8%.[23] Other studies have projected loss of annual GDP by 2.5%-4.5% by 2030 due to heat waves alone.[24] The cumulative costs of climate change adaptation till 2030 have been estimated to be ₹85.6 lakh crores[25] (US $1.2 trillion), equivalent to nearly 58% of India's GDP in 2019-20 at constant prices.[26]

Climate change will increase the stress on the country's natural ecosystems, agricultural output, and freshwater resources while also causing escalating damage to infrastructure. These will have severe consequences for the country's food, water and energy security, and public health. In the absence of rapid, informed, and far-reaching mitigation and adaptation measures, climate change impacts are likely to pose serious challenges to sustaining the country's economic growth and achieving the sustainable development goal (SDG) targets.[27]

It is in India's interest that the GHG emissions are reduced significantly, and serious effort is made globally to meet the 1.5°C goal. But the world is nowhere near meeting the target of 1.5°C. In fact, even if countries meet the commitments made under the Paris Agreement, the world is heading for a 3.2°C temperature rise above pre-industrial levels, which will lead to more wide-ranging and destructive climate impacts.[28] The *Annual Emissions Gap Report of the United Nations*, which compares where GHG emissions are heading versus where they need to be, shows that emissions need to fall by 7.6% each year over the next decade if the world is to get back on track towards the goal of limiting temperature increase to close to 1.5°C. This would require all countries to reduce their emissions and substantially increase their Nationally Determined Contributions (NDCs), including putting policies in place to implement them.[29]

India has set three major goals under its NDC - increase the share of non-fossil fuels to 40% of the total electricity installed capacity by 2030, reduce the emission intensity of the economy by 33% to 35% by 2030 from 2005 levels, and create additional carbon sink of 2.5-3 billion tonnes of CO_2 equivalent, through additional forest and tree cover by 2030.[30] Under current policy mechanisms, the country is projected to meet its unconditional NDC targets. In fact, India's emissions are likely to be 15% lower than its NDC target emission.[31] The country, therefore, should further enhance its NDC ambitions to contribute towards the goal of 1.5°C. This is highly feasible if we consider the projections of the country's energy mix. The latest estimates by the CEA, as discussed earlier, indicate that the share of non-fossil fuels in the electricity mix (installed capacity) could be as high as 65% by 2029-30.[32]

It is undeniable that curtailing coal consumption is an absolute necessity for India to reduce its GHG emissions, as it is the single largest source of such emissions in the country. India, therefore, must start planning for coal phase-out to contribute towards global climate action.

4.6 AVOIDING UNPLANNED MINE CLOSURE

While the phase-out of coal power by 2050 seems eminently feasible[33], a deliberative approach is necessary to avoid socio-economic disruptions in the coal mining areas, as observed from global experiences (as discussed in

Table 1: District-wise status of coal mine leases in Jharkhand

District	No. of coal mine leases	No. of temporarily/ permanently discontinued mine leases	Profit and Loss- making working mines			Remaining life of working mines as on 2020		
			Total working mine leases	Profitable	Loss-making	0-10 years	10-20 years	>20 years
Bokaro	25	16	9	6	3	6 (18.6 MTPA)	1 (11.0 MTPA)	2 (1.6MTPA)
Dhanbad	105	48	57	18	23	14 (14.0 MTPA)	15 (21.0 MTPA)	28 (32.6 MTPA)
Giridih	1	0	1	0	0	0	0	1 (0.5MTPA)
Deogarh	1	0	1	1	0	0	1 (2.5MTPA)	0
Godda	9	8	1	1	0	1 (17.0 MTPA)	0	0
Jamtara	5	5	0	0	0	0	0	0
Pakur	2	1	1	0	0	0	0	1 (15.0 MTPA)
Chatra	5	2	3	2	1	2 (22.0 MTPA)	1 (3.5 MTPA)	0
Hazaribagh	10	3	7	2	4	2 (3.5 MTPA)	2 (1.6 MTPA)	3 (18.0 MTPA)
Ramgarh	24	12	12	3	8	3 (5.7 MTPA)	6 (12.7 MTPA)	3 (6.2 MTPA)
Jamshedpur	1	1	0	0	0	0	0	0
Latehar	3	0	3	2	0	2 (3.5 MTPA)	1 (20.0 MTPA)	0
Palamu	1	1	0	0	0	0	0	0
Ranchi	11	8	3	2	1	2 (7.0 MTPA)	0	1 (0.93 MTPA)
Total	**203**	**105**	**97**	**37**	**37**	**31 (91.3 MTPA)**	**27 (72.3 MTPA)**	**39 (74.9 MTPA)**

Source: Department of Mines and Geology, Jharkhand, Lok Sabha Unstarred Question No.: 635 dated September 16, 2020.
Notes: Data on profitability of 23 coal mines not available; figures in parentheses is the combined production capacity of working mines.

Chapter 2). Case studies of unplanned mine closure show that closure has been most definitely followed by a surge in unemployment, poverty, and net outmigration from a region. It has also resulted in social protest and political unrest in some regions. For India, the limited literature on unplanned closing of mining activities does not tell a very different story (*see Box: Impacts of unplanned mine closure in India*).

But the fact is also that the coal mines are closing in the country without any plan for the socio-economic transition of the affected communities. This is especially true for the older coal mining areas in states like Jharkhand. Of the 203 mines leases in Jharkhand, 106 are temporarily or permanently closed.[34] Many of them, especially underground mines, have closed down because they are unprofitable. In fact, about half of Jharkhand's operational mines are also unprofitable and are being cross-subsidised by profitable mines.

The situation is worse at the district level. In Bokaro, 16 of the 25 mines are already closed. Of the nine operational mines, six will exhaust their reserves in the next 10 years. In Jamtara, all five mines are closed. A similar situation exists in districts like Hazaribagh and Ramgarh.

The current situation, therefore, is one of turning a blind eye to an impending crisis. The issue of unplanned closure, which is still subterranean, will become a full-blown crisis if we don't address it now.

Impacts of unplanned mine closure in India

The unplanned closure of the Sargipali lead mine in the Sundargarh district of Odisha provides an example of socio-economic disruption at the sub-district level. The mine, operated by Hindustan Zinc Limited, had been active for three decades before its unprofitability prompted the state government to close it. During its operational period, it had about 600 employees and contract labourers. The closure of the mine led to a massive shrinking of income opportunities for the local community. While the permanent employees were provided the opportunity to avail of a voluntary retirement scheme, the labourers and associated businesses in the area were left with huge uncertainty.[1] Since the mines were in remote areas, the local community was predominantly dependent on mining. With the closing of the mines, unemployment and income loss rose suddenly in the area and led to distress wage rates. People who had invested in various businesses could not repay loans and were forced into an interlocked credit market. Out-migration increased but proved to be a challenge for workers in the middle-age and older-age brackets, who had limited choices due to family commitments. Many of them were left with no choice but to commute 22 to 40 km daily to neighbouring towns to find work.[2]

The local impacts of the sudden stoppage of mining activities have also been observed in the case of suspension of iron ore mining activities in Goa. However, unlike the above example, the closing of mining activities here followed the Supreme Court's order in observation of rampant illegal mining activities, which caused huge loss to the state exchequer and impacted the local environment severely. In October 2012, the Supreme Court stopped all mining activities in leases where irregularities were detected, responding to a petition by the non-profit Goa Foundation.[3]

However, the economic distress of the local communities associated with mining activities became a concern following the suspension orders. The benefits extended by mining companies as part of their Corporate Social Responsibility (CSR) activities, such as providing medical and educational facilities to households in mining areas, also got affected. This caused unfavourable outcomes, including a drop in the overall attendance of school-going children.[4]

The economic fallout, in fact, constituted a key reason for the Court's decision to lift the mining ban in 2014.[5] The Court, while pronouncing its judgement in April 2014, noted:

"We find from the report of the Expert Committee that the State of Goa heavily depends on iron ore mining for revenue as well as employment... Moreover, as Mr. Ravi Shankar Prasad, learned senior Counsel appearing for 33 Panchayats, has submitted about 1.5 lakh people are directly employed in mining in Goa, and a large number of persons have taken bank loans and purchased trucks for transportation of iron ore. Hence, people who earn their livelihood through work in connection with mining will be seriously affected if mining is totally banned to protect the environment. We cannot, therefore, prohibit mining altogether...".[6]

While lifting the ban, the Court also imposed certain conditions for restarting mining, including specifying a cap on mineral extraction, considerations for ecological buffer, proper management of overburdens, and taking care of intergenerational equity.[7]

While the two cases mentioned above had different reasons for sudden closure/halt of mining activities, they suggest that unplanned mine closure creates major disruptions for the local communities. Therefore, if the decarbonisation of the economy must happen, planning for it should start now. Any hastened or abrupt decision will lead to more chaos than resolution.

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[1] Mishra, S. (2018). Mine Closures and the Issue of Livelihood. *Economic & Political Weekly, Vol. 53*
[2] Ibid
[3] Supreme Court of India. (2014, April 21). Judgement in the matter of *Goa Foundation Vs. Union of India (UOI) and Ors*. Writ Petition (Civil) No. 435 of 2012.
[4] Arondekar Sheetal D. and Murthy I. Bhanu, 2017, *A Study on the Socio-Economic Impact of Mining Ban on the Households in Goa's Mining Belt*, SDMIMD.
[5] Supreme Court of India. (2014, April 21). Judgement in the matter of *Goa Foundation Vs. Union of India (UOI) and Ors*. Writ Petition (Civil) No. 435 of 2012.
[6] Supreme Court of India. (2014, April 21). Judgement in the matter of *Goa Foundation Vs. Union of India (UOI) and Ors*. Writ Petition (Civil) No. 435 of 2012, Para 63.
[7] Supreme Court of India. (2014, April 21). Judgement in the matter of *Goa Foundation Vs. Union of India (UOI) and Ors*. Writ Petition (Civil) No. 435 of 2012.

JUST TRANSITION FRAMEWORK

CHAPTER 1

POLITICAL ECONOMY OF COAL MINING IN JHARKHAND

Deepak Bara, iFOREST

- Jharkhand holds 26% of India's coal resources and is the third largest coal-producing state in the country.
- Mining contributes to about 10% of Jharkhand's GDP and mineral revenue accounts for 10.5% of the state's total revenue receipts.
- Over the past five years, the mining and quarrying sector has not been the primary driver of growth in the state; the tertiary sector is growing at the fastest rate.
- CCL, a CIL subsidiary, is the largest producer of coal in the state and has over 79,000 hectares of land under its control.
- Laws like the CBA Act, CNT Act and SPT Act continue to shape mining and community relations in Jharkhand.

Lakhs of tribal and indigenous people have been displaced from their lands without proper rehabilitation. It is, therefore, an irony that Jharkhand illuminates the country with its coal but is forced to live in darkness.

—**Hemant Soren,** CHIEF MINISTER OF JHARKHAND

1.1 OVERVIEW

If there is one image of coal mining in India that defines the popular imagination, it is of Dhanbad. From stark pictures of burning coalfields of Jharia to the depiction of mine workers and coal mafia in blockbuster films such as *Kala Patthar* and *Gangs of Wasseypur*, Dhanbad epitomises the riches and misery of coal mining in Jharkhand at the same time.

Since commercial coal mining started in India in 1774, the Raniganj coalfields (then under the Bengal presidency) was the most significant (some argue only) coal-producing area for nearly a century. By the late 19th century, good quality coal was found in the Jharia coalfields, and with the expansion of Indian railways, this region also became accessible to coal extraction. By 1914, just around World War I, Jharia was producing more than nine million tonnes (MT) of coal annually, nearly double of Raniganj. Since then, it has become one of the most important coalfields of India. In the following years, a number of coalfields were opened up in Jharkhand (then part of Bihar), including the Bokaro, Ramgarh, and Karanpura coalfields.[1] The presence of coal mining for more than 130 years has been instrumental in shaping Jharkhand's economy, land, and social relations.

Coal's relationship with the local community and workers has also evolved with the changing course of ownership in the mining sector. While coal mining started under British companies in the late 19th century, from the early 20th century Indian miners from other parts of the country came to Dhanbad. At the same time, migrant workers slowly started replacing local workers, who were mostly *adivasis*- the indigenous people. The private coal companies found the migrant workers easier to work with, as they were more 'disciplined' and easier to control than the locals.[2]

In the 1970s, with nationalisation of coal mining through the enactment of the Coal (Mines) Nationalisation (CMN) Act (1973) and the creation of Coal India Limited (CIL), a public sector undertaking (PSU), in 1975, labour policies of the sector also changed. One of the factors behind nationalisation was arguably to end the exploitative practices of private companies. Therefore, in the post-1970s, employment in the coal sector became permanent. It was of much significance for the people who got a job in coal mining, as it offered them security and, in many ways, better pay.

However, in 1993, with the amendment of the CMN Act, private parties were allowed into the coal mining business (for captive purposes). Over the years, the coal PSUs also started subcontracting coal mining activities to various private parties, including contractors for mining-related activities and Mine Developer and Operator (MDO). As it stands, the private operators engage more people on a contractual basis. The wages paid to these

labourers, in most instances, are merely a fraction of what formal employment with the mining company could have offered.[3] In Jharkhand's top coal mining districts, local resentment with mining is thus growing.

Besides allowing a system of contractual labour, the post-1990s period also reinforced the business and political interest in coal mining, which was already present in this region. The demand for control over the mineral resources was, in fact, an important reason for carving out Jharkhand from Bihar in 2000.[4] In the following years, coal persisted as a central factor in the powerplay of Jharkhand's politics by coalition governments. Reports on Jharkhand's coal business note that the political clout and the strongmen of coal mining have been in collusion, having the resources necessary to hold power. Coal families have increasingly sought election tickets to have the power to influence coal business.[5]

While the collusion between coal business (legal and illegal), political members, and parts of bureaucracy is difficult to establish through a paper trail, the coal scam (unveiled between 2012-14) was a major exposé. Madhu Koda, the ex-Chief Minister (CM) of Jharkhand was implicated in taking bribes (amounting to ₹4,000 crores, equivalent to over half a billion US $) and illegally facilitating allocation of coal (and iron ore) mines to private businesses.[6] While the coal gate judgement of the Supreme Court in 2014 brought an end to the discretionary allocation of coal mines and prompted the institutionalisation of an auction mechanism in 2015, the strongmen referred to as the '*coal mafia*' still persist. In addition to illegal coal business and outright coal theft, these coal mafia also have a stronghold on the labour force, some of the unions, and local politics, which is much coal centric.[7]

Jharkhand's abundant coal reserves and legacy of coal mining activities over the decades have generated economic opportunities while feeding into the country's energy demand and contributing to economic growth. However, this welfare has clearly been 'relative'. While at one end of the spectrum lie people who have benefitted from mining and mining businesses, at the other end, there are the ones who remain impoverished in their own land. The future planning for Jharkhand's coal regions will, therefore, be a balancing act of the state politics, businesses and strongmen, the unions, the central government and its PSUs, and rights of the local community.

1.2 COAL RESOURCES AND PRODUCTION

Jharkhand has the highest coal resources in India, estimated to be about 84.5 billion tonnes (BT), accounting for nearly 26% of the country's total resources.[8] Non-coking coal constitutes the maximum proportion of this, estimated to be about 53.2 BT (*see Table 1: Coal resources in Jharkhand, p52*).

In 2019-20, the state produced about 130 million tonnes (MT) of coal, a slight dip from the previous year (*see Figure 1: Coal production in Jharkhand, p52*). The top coal-producing districts in the state include Dhanbad, Chatra, Bokaro, Ramgarh, Hazaribagh, and Godda.

As of June 2020, there were 95 working and 108 temporarily discontinued/ non-working coal mines in Jharkhand.[9] Central Coalfields Limited (CCL), a CIL subsidiary, is the main coal mining company. Bharat Coking Coal Limited (BCCL), another CIL subsidiary, is also an important player, particularly in Dhanbad.

1.3 CONTRIBUTION TO GOVERNMENT REVENUE

Mineral revenue collection in Jharkhand has grown at compound annual growth rate (CAGR) of 14.3% from 2014-15 to 2018-19, as per the information of the State Department of Mines and Geology. Between 2014-15 to 2018-19, revenue collection has increased from ₹3,500 crore (US $486 million) to ₹5,978 crore (US $830 million). Coal typically accounts for about 75% of the total mineral revenue (*see Figure 2: Revenue collection from minerals in Jharkhand, p52*).[10]

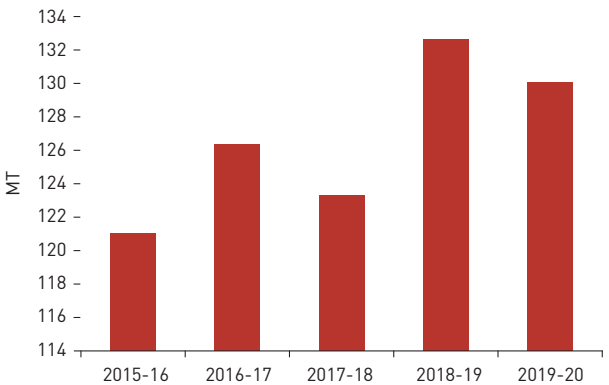
Revenue from mines, in fact, constitutes the majority share of the state's own non-tax revenue. For example, in 2018-19, the total non-tax revenue of the state was ₹8,258 crores (US $1.1 billion); the share of mineral revenue in this was about 72%. Overall, the share of mineral revenue in the total state revenue receipts stood at about 10.5%.[11]

However, over the years, the share of mineral revenue in the state's own non-tax revenue has been steadily decreasing, from 86% in 2013-14 to 72% in 2018-19 (*see Figure 3: Share of minerals in Jharkhand's non-tax revenue, p52*).[12] This is due to the increase in non-tax revenues from other sectors.

Table 1: Coal resources in Jharkhand (MT)				
Type	Measured/Proven	Indicated	Inferred	Total
Prime coking	**4,461.2**	**645.3**	**0.0**	**5,313.1**
Medium coking	**13,970.6**	**9,685.0**	**1,590.0**	**25,245.7**
Semi coking	**223.3**	**471.6**	**53.5**	**748.3**
Non coking	**29,170.2**	**19,598.3**	**4,430.4**	**53,198.9**
Total	**48,031.9**	**30,400.1**	**6,073.9**	**84,506.0**

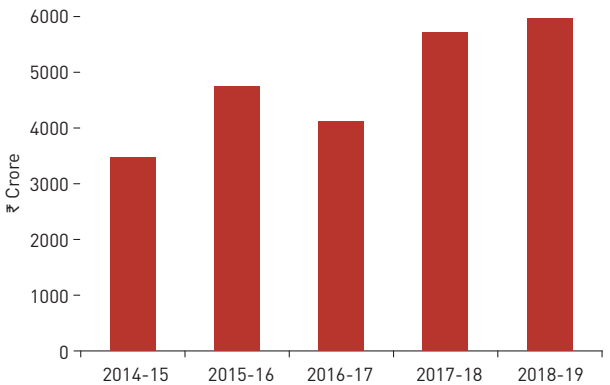
Source: Central Mine Planning and Design Institute, 2019

Figure 1: Coal production in Jharkhand



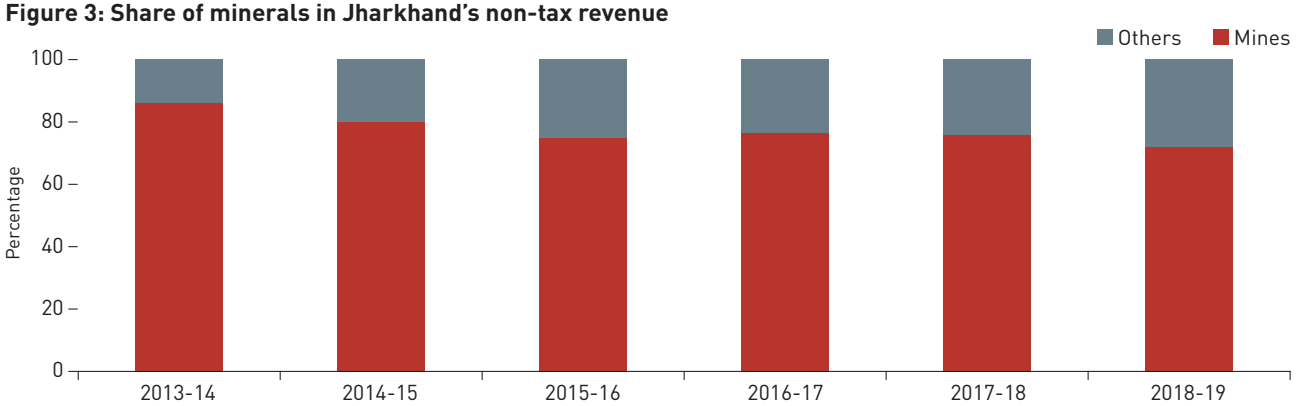
Source: Department of Mines and Geology, Government of Jharkhand, June 2020

Figure 2: Revenue collection from minerals in Jharkhand



Source: Department of Mines and Geology, Government of Jharkhand, June 2020

Figure 3: Share of minerals in Jharkhand's non-tax revenue



Source: Fiscal Policy Strategy Statement and Medium-Term Fiscal Plan, Government of Jharkhand, 2020

Minerals are not only a source of revenue for state governments, but also for mining districts, which directly receive a significant amount of money from mandatory contributions made by mining companies towards District Mineral Foundation (DMF). In just five years, the cumulative accrual in DMF trusts in Jharkhand stood over ₹5,612 crores (US $800 million). Coal accounts for over 74% of this.[13]

However, with respect to the overall state growth scenario, the mining and quarrying sector has not been the major growth impetus in the past years. The main driver has been the tertiary sector. Between 2014-15 to 2019-20, the economy of Jharkhand grew at an average annual rate of 6%. During this period, the tertiary sector grew at 9.5% and the mining and quarrying sector at 5.3%. In 2019-20, the tertiary sector contributed about 65% to the growth of the state's economy, while that of the primary and secondary sector was about 15% and 20%, respectively. The contribution of the mining and quarrying sector (a part of the primary sector) was only 4.1%.[14]

1.4 LAWS AND POLICIES IN COAL-BEARING AREAS

Policies and laws on coal mining have played a significant role in shaping the political economy of Jharkhand. These include laws related to land acquisition, mining, as well as safeguarding the land and resource rights of local communities (particularly indigenous people) and protecting labour rights. The scope of these laws and the way they have been perceived and used by various actors, including government, coal companies, and the local community, has shaped the social, economic, and environmental milieu of coal bearing areas.

1.4.1 Land acquisition

Since coal has been considered a national asset and a resource for 'public purpose' (such as ensuring energy security), regulations pertaining to land acquisition for coal mining confers certain exclusive power to the government to acquire such land. In this respect, the most important regulation is the Coal Bearing Areas (Acquisition and Development) Act, 1957 (CBA).

The CBA was enacted to ensure greater government control over the coal mining industry. For this, the law facilitates land acquisition by the state government, in a process akin to the exercise of eminent domain. As mentioned in the preamble of the Act-

"*An Act to establish in the economic interest of India greater public control over the coal mining industry and its development by providing for the acquisition by the State of unworked land containing or likely to contain coal deposits or of rights in or over such land, for the extinguishment or modification of such rights accruing by virtue of any agreement, lease, licence or otherwise, and for matters connected therewith*".[15]

Over the years, the CBA has allowed public sector companies, the CIL and its subsidiaries, to acquire substantial stretches of land for prospecting and mining purposes. The Land Acquisition Act, 1984 (which in 2013 was replaced by the Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013 or the LARR Act), complimenting the spirit of the CBA, has been used for acquiring land for other purposes, such as for developing infrastructure and townships for coal mines.

Besides, the CBA and Land Acquisition Act (later LARR), the coal mining PSUs possess significant land area under the CMN Act, 1973 (earlier two separate laws, Coking Coal Mines Nationalisation Act, 1972 and the Non-Coking Coal Mines Nationalisation Act, 1993). For example, as per official information of CCL available in the public domain, the company has more than 79,151 hectares of land under its possession under various laws and as railway property. This is about 1% of Jharkhand's geographical area. (*see Table 2: Land under possession of CCL, p54*)

1.4.2 Mine allocation

The coal scam (unveiled between 2012- 2014) was a major exposé of the irregularities in coal block allocation for captive mining. In a judgement of August 2014, the Supreme Court of India declared all coal blocks (204 in total) that were granted lease between 1993 to 2010 for captive purposes to be illegal, as they were allotted in an arbitrary and non-transparent manner.[16]

Until 1993, there was no specification for allotting coal mines for captive mining purposes. The 1973 CMN Act allowed private players in captive coal mining only for end-use in the iron and steel industry. In 1993, the CMN Act was amended to allow private sector participation

Table 2: Land under possession of CCL		
Mode of possession	Type of possession	Land owned (ha)
State railways	Railway property	**9,331.8**
Nationalisation	Under the Coking Coal Mines Nationalisation Act, 1972 and	**2,039.3**
	Under the Non-Coking Coal Mines Nationalisation Act, 1973	**13,345.1**
Coal Bearing Areas (Acquisition & Development) Act, 1957	Total land notified under the Act and in legal possession (covers area under mining and other rights)	**49,519.5**
Mineral Concession Rules, 1960 and other State Acts		**2,770.0**
Land Acquisition Act, 1984	Possession under the Act	**2,128.7**
Direct purchase		**16.8**
Total		**79,151.0**

Source: CCL Official site, accessed July 2020

in captive mining for power generation. Other captive end uses were also notified from time to time, such as cement, coal washery, etc. In the same year, a 'Screening Committee' was set up by the Ministry of Coal, and the allocation of coal mines to private companies happened through this Committee. For government companies, allocations for captive mining were made directly by the union coal ministry.

However, following the coal scam and the Supreme Court judgment (2014), the central government brought in a transparent mechanism to allocate coal blocks. The government enacted the Coal Mines (Special Provisions) Act, 2015, that allowed the allocation of coal blocks through auction. The Act was further amended through the Mineral Laws (Amendment) Act, 2020, allowing commercial coal mining by private entities to bring in competitiveness in the coal sector.[17]

1.4.3 Community land rights

While the laws pertaining to land acquisition and coal extraction have enabled mining companies to acquire land in Jharkhand, there are also laws to safeguard land rights (particularly tenancy rights) of local communities. The Chotanagpur Tenancy Act (CNT Act), 1908, and the Santhal Pargana Tenancy Act (SPT Act), 1949, are particularly important in this regard. These laws were enacted in response to the movement of indigenous people (*adivasis*) for protecting their land and resource rights. While the CNT Act is related to the governance of Scheduled Areas in the Chotanagpur plateau in Jharkhand's western region (also partly covers the North Karanpura coalfields), the SPT Act governs the *Santhal Pargana* region in the eastern part of the state. Both these laws restrict the sale and transfer of *adivasi* land to non-*adivasis*, although there have been efforts in the past to dilute them.[18]

1.4.4 Labour laws

Another important set of laws that defines the coal mining areas are the labour laws. Multiple regulations are in place to ensure the wage and social security of the coal workforce. These include the Employees Compensation Act (1923), Coal Mines Provident Fund and Miscellaneous Provisions Act (1948), Unorganised Workers Social Security Act (2008), the Minimum Wages Act (1948) and subsequent Jharkhand Minimum Wages Rules (including amendments) developed under it, and the Child Labour (Prohibition and Regulation) Amendment Act (2016).

Since the nationalisation of coal mines in the 1970s, the wage structure, benefits, and welfare measures for the workers and staff formally employed by CIL and its

subsidiaries are determined by the National Coal Wage Agreements (NCWA). These agreements are negotiated once every five years by the Joint Bipartite Committee for the coal industry, comprising representatives of labour unions and management of CIL and its subsidiaries. Most of the major unions are active in the coal mining regions of Jharkhand, including the Indian National Trade Union Congress (INTUC), Central Industrial Trade Union (CITU), All India Trade Union Congress (AITUC), Bharatiya Mazdoor Sangh (BMS), and Hind Mazdoor Sabha (HMS). Small trade union groups of regional political parties are also active in the state.

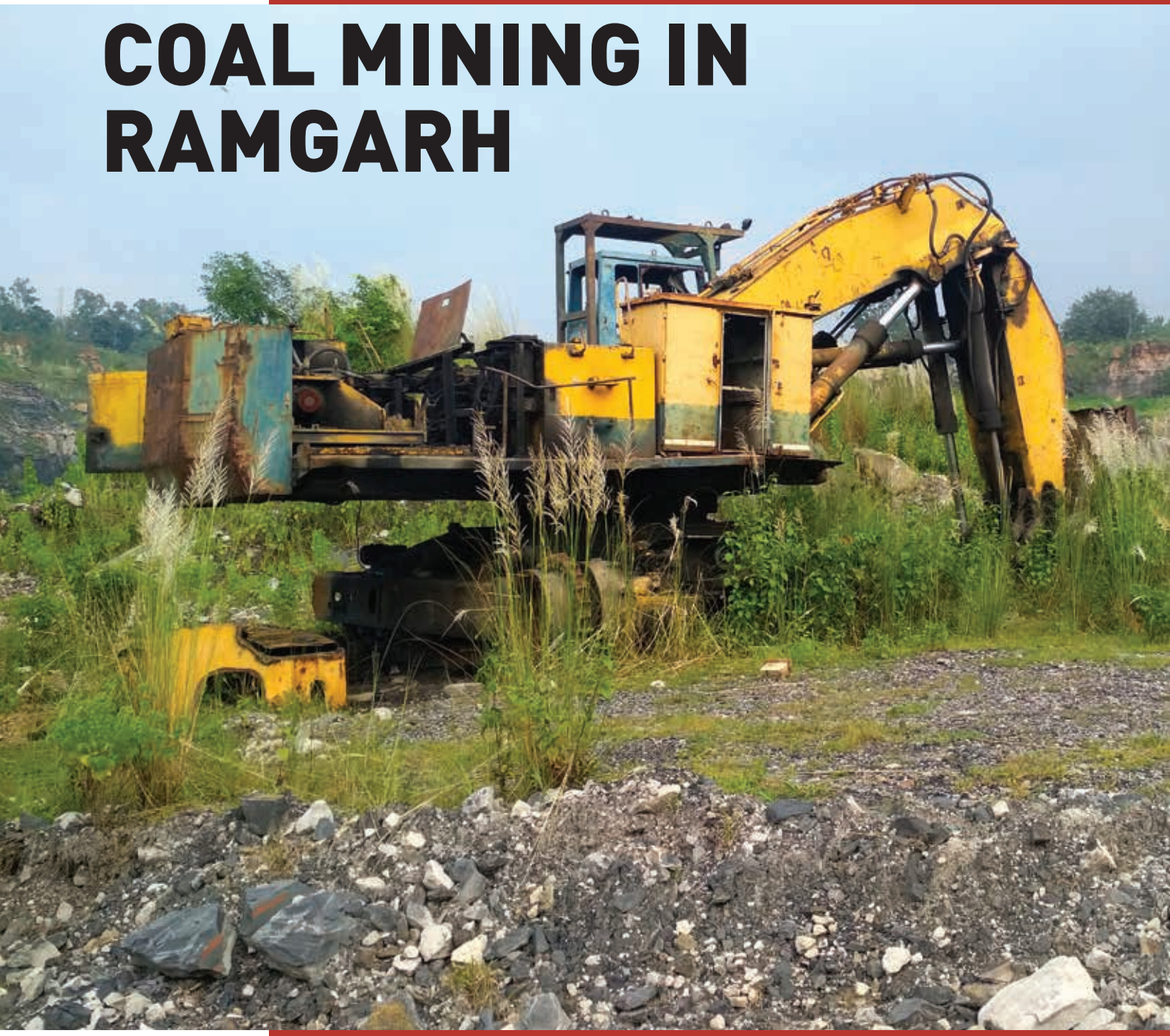
However, major labour rights challenges lie with the contract workers, who now constitute a significant share of Jharkhand's coal mining workforce. The state PSUs outsource the mining operations to contractors, which are privately-owned companies, and typically from outside the state. These private operators, also called MDOs, engage many labourers (including migrants) as contract workers. Even though the contract workers are entitled to minimum wages, and social security benefits such as pension and healthcare[19], interactions with workers and trade union members reveal that the contractors pay way below the minimum wages to the contract workers and do not provide them with the social security benefits either. Since these contract labourers in most cases are not part of any unions, they also do not have the backing to negotiate their terms. This is substantiated by the fact that CIL payments to MDOs are in between minimum wages and CIL wages.[20]

In addition to contract workers, a large number of informal workers are also involved in activities, such as, loading and unloading, transportation, etc. All of these workers constitute the 'non-inventoried' lot and have no fixed income or social security benefits.

The land, resource, and labour relations are a part of everyday life for a majority in Jharkhand's coal-bearing areas. The various actors of the coal economy have their own perceived identities in this. While the PSUs represent the interests of the national economy, the poor and the dispossessed, often found to be 'illegally' procuring and selling coal, is the face of the subsistence coal economy.[21] There is a host of other identities lying in between. Imagining a transition of these areas, therefore, requires an understanding of and a dialogue with all these stakeholders.

CHAPTER 2

COAL MINING IN RAMGARH



Srestha Banerjee, iFOREST

- Ramgarh is the fifth largest coal producing district in Jharkhand with 10% share of the state's total production.
- There are 24 coal mining leases in the district occupying 10.5% of its geographical area.
- More than 50% of the coal mines are temporarily or permanently closed; only one-third of the operational mines are profitable.
- If no new mines come up, most of the existing coal mines will close by 2040.
- Coal companies are not interested in expanding production in Ramgarh, as the coalfields are quite old and exploited.

Coal mines in Ramgarh are being closed down one by one. The industries here say that importing coal from Australia is now cheaper than taking it from Ramgarh.

—Jaiprakash Bhai Patel, MLA, MANDU, RAMGARH

2.1 OVERVIEW

Ramgarh is among the top five coal mining districts of Jharkhand, strategically located on the industrial belt along the Damodar river, and close to major towns such as Hazaribagh and Ranchi. The presence of coal mining has attracted several coal-based industries in the district, such as thermal power, steel manufacturing, refractories, cement plants, etc.

Coal mining in Ramgarh is more than 100 years old. In 1917, L.S.S.O'Malley described the coalfields of Ramgarh: "*.... close by... is the Ramgarh field (40 square miles), in which, however, coal is believed to be of inferior quality. A still larger field in the same district is that called Karanpura, which extends over 544 square miles and has an estimated capacity of 9,000 million tons.*"[1] Records suggest that the Ramgarh coalfields were opened up in 1920. The first mine – Bhurkunda – started operations in 1924.[2]

Given that mining activities have been happening for a long time in the district, there are a number of mines that have either been exhausted or discontinued due to concerns of economic viability. Many of the existing mines are also getting exhausted. If no new mines are opened up, coal mining activities in the district, in fact, have a life of only 20-25 years.

Ramgarh, therefore, constitutes an appropriate case study to understand the implications of coal mine closure as it has a mix of closed mines and operational mines. It is also a district where the need to plan a just transition is eminent, as mines are getting exhausted fast, leaving a timeframe of 10 to 20 years to execute a transition plan. The district's demographic distribution and socio-economic structure also offer an interesting context to understand the vulnerability and resilience of the coal-dependent community.

2.2 RESOURCES AND RESERVES

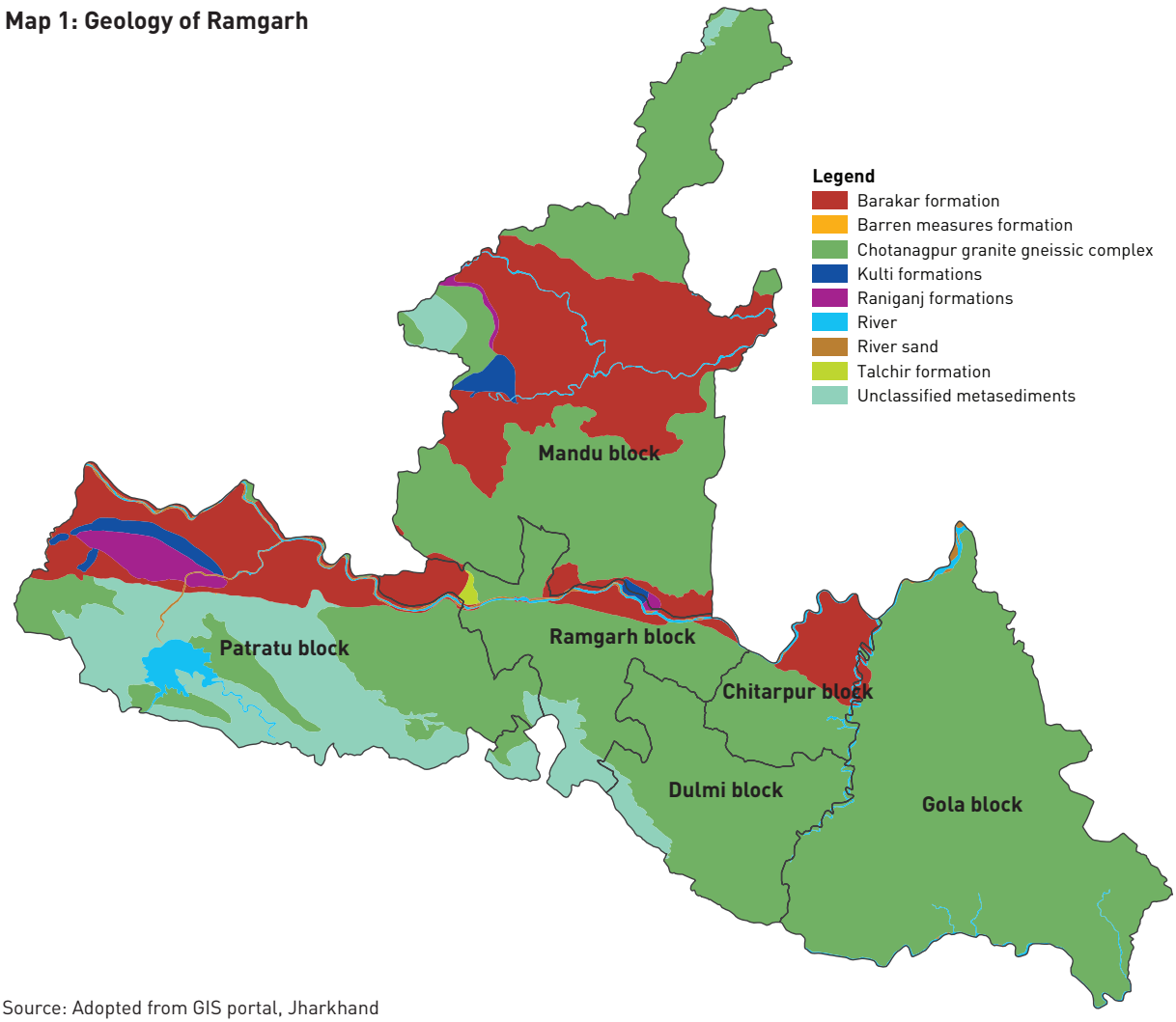
Coal deposits in Ramgarh are found mainly in the Barakar formation. Three of Jharkhand's twelve coalfields cover the

Table 1: Coal resources in Ramgarh (MT)

Coalfield	Proved	Indicated	Inferred	Total resources
Ramgarh	**756.1**	**742.1**	**58.1**	**1,556.2**
South Karanpura	**5,176.1**	**1,312.3**	**1,143.3**	**7,631.6**
West Bokaro	**3,801.0**	**1,352.9**	**33.7**	**5,187.5**
Total	**9,733.2**	**3,407.2**	**1,235.0**	**14,375.4**

Source: Indian Minerals Yearbook, 2018-19

Map 1: Geology of Ramgarh



Source: Adopted from GIS portal, Jharkhand

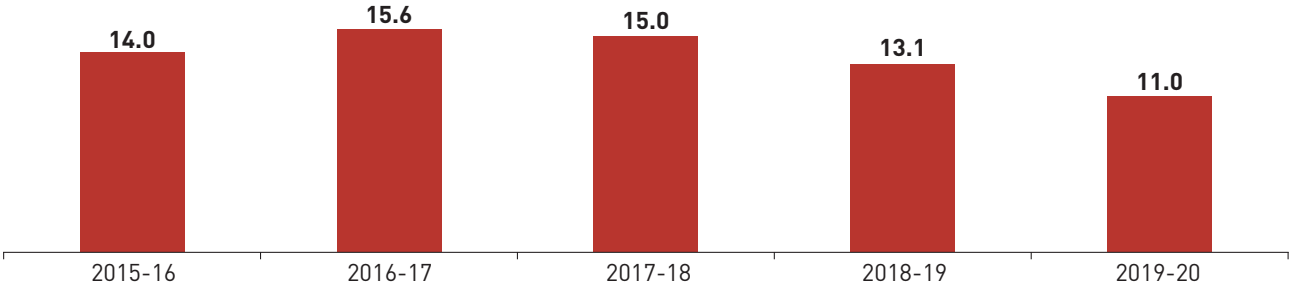
coal mining areas of the district. These include Ramgarh coalfields, South Karanpura coalfields, and West Bokaro coalfields. While parts of West Bokaro also fall in Bokaro and Hazaribagh districts, most of the coalfield area falls in Ramgarh. The combined coal resources in these coalfields are estimated to be over 14.4 billion tonnes (BT). This accounts for nearly 17% of Jharkhand's total coal resources.[3] The mineable coal reserves in the district have been estimated to be about 752.7 million tonnes (MT) as of March 2020.[4]

2.3 PRODUCTION AND OPERATIONS

Central Coalfields Limited (CCL) is the major coal-producing company in Ramgarh and is the holder of all but one coal mine leases. The only private company in the district is Tata Iron and Steel company (TISCO, now known as Tata Steel Ltd.), which owns one captive mine in the West Bokaro coalfields.

A total of 24 coal mining leases have been granted in Ramgarh. Data on lease area is available for 22 of these

Figure 1 : Annual raw coal production (MT)



Source: District Mining Office, Ramgarh, 2020

leases, which shows that coal mines occupy an area of 14,216 hectares (ha) in the district.[5] This is equivalent to 10.5% of the district's geographical area, which is quite significant.

Ramgarh is the fifth largest coal producing district in Jharkhand (as of June 2020). The average coal production in the district from 2015-16 to 2019-20 was 13.7 MT per year. In 2019-20, production was only 10.9 MT. The Coal production has started to reduce since 2017-18, due to the temporary or permanent closing of coal mines owned by CCL.

As of April 2020, the district had 12 operational coal mines, spread over more than 9,300 hectares (ha). The majority are open cast (OC), and only two mines- Bhurkunda and Kedla- have both OC and underground (UG) operations. The mines are located in four blocks – Mandu, Patratu, Chitarpur, and Ramgarh, with the largest concentration in Mandu block.

In line with the declining trend of coal production in the district over the past years, production from nine out of the 12 operational mines has also reduced in the last three years. Mines like Sirka, Pundi, and Kedla had practically no production in 2019-20. In fact, the two largest mines – Rajrappa and West Bokaro Ghatotand – which account for more than 60% of the district's production, have only recorded marginal increase in production.

Most of the operational mines are also unprofitable. Only three out of the 11 mines operated by CCL are making profits. All the unprofitable mines are also recording a reduction in production in the last three years.

Besides the operational mines showing a production decline, there are many mines in the district where production has been closed, either temporarily or permanently.

Ramgarh had nine temporarily closed mines as of April 2020. Procedural delays in the release of land and associated permits, land authentication issues and operational difficulties such as waterlogging constitute the majority of 'recorded' reasons for their temporarily closed status. While these mines are expected to resume operations once the concerned problems are resolved, field observations suggest otherwise. For example, the two underground mines, Saunda and Sarubera, are reported to be loss-making and will most likely not resume production even if procedural issues are addressed (*see Table 4: Temporarily closed mines, p62*).

There are also six CCL-owned coal mines in the district that were closed down between 2016 to 2020. All six had underground operations and had become loss-making. These mines had been operational for at least two decades before the decision was taken to close them down (*see Table 5: Permanently closed mines, p62*).

2.4 REVENUE FROM COAL MINING

Revenue from coal mining comes in various ways, including royalty, auction proceeds, dead rent, and coal cess. Besides, mining companies also directly contribute to District Mineral Foundation (DMF) trusts and the National Mineral Exploration Trust (NMET). As per government sources, the majority of revenue comes from royalty and DMF payments.

If these two major sources are considered, the total revenue earned from coal mining in Ramgarh has averaged ₹602 crores (US $84 million) per year in the last five years from 2015-16 to 2019-20 (*see Table 6: Major revenue from coal mining, p62*). While royalty goes to the state government, the DMF earnings come directly to the district and constitute the biggest and

Table 2: Operational coal mines					
Command area	Block	Name of mine	Operation type	Lease area (ha)	Production capacity (MTPA)
Rajrappa	Chitarpur	Rajrappa	OC	**1,467.9**	**3.0**
Barka Sayal	Patratu	Bhurkunda	OC & UG	**910.2**	**2.1**
Argada	Ramgarh	Sirka	OC	**637.9**	**1.3**
Kuju	Mandu	Topa	OC	**950.0**	**7.0**
		Pundi	OC	**1,357.6**	**3.0**
		Karma	OC	**244.0**	**1.2**
Charhi Hazaribagh	Mandu	Parej East	OC	**404.6**	**1.8**
		Tapin North	OC	**304.0**	**2.5**
		Jharkhand OCP	OC	**319.8**	**2.7**
		Kedla	OC	**649.3**	**1.4**
			UG	**333.5**	**0.2**
TISCO	Mandu	West Bokaro Ghatotand	OC	**1,740.0**	**7.0**
Total				**9,318.0**	**33.1**

Source: Compiled from District Mining Office, EIA reports of mines and Mines Portal, Jharkhand

Table 3: Production and profitability of operational mines				
Name of mine	2017-18	2018-19	2019-20	Profit/Loss-making in 2019-20
Bhurkunda (OC)*	**1.1**	**0.7**	**0.7**	Unprofitable
Sirka	**0.1**	**0.2**	**0.0**	Unprofitable
Rajrappa	**1.3**	**1.3**	**1.4**	Profitable
Topa	**2.0**	**1.2**	**1.2**	Unprofitable
Pundi	**0.3**	**0.2**	**0.0**	Unprofitable
Karma	**0.5**	**0.7**	**0.5**	Profitable
Parej East	**0.8**	**0.7**	**0.6**	Unprofitable
Tapin	**2.1**	**1.7**	**0.5**	Unprofitable
Jharkhand OCP	**1.3**	**1.2**	**0.8**	Profitable
Kedla (OC)	**0.3**	**0.1**	**0.0**	Unprofitable
Kedla (UG)	**0.1**	**0.1**	**0.1**	Unprofitable
West Bokaro Ghatotand	**5.1**	**5.0**	**5.1**	Not available
Total (MT)	**14.9**	**13.0**	**10.9**	

Source: District Mining Office, Ramgarh, 2020
*Production from Bhurkunda UG has been recorded as zero over the past three years

Table 4: Temporarily closed mines				
Command area	Name	Block	Type of operation	Reason for closure
Barka Sayal	Saunda	Patratu	UG	Water-logged and loss-making mines
	Central Saunda	Patratu	UG	Violation of DGMS and water-logged seams
Charhi Hazaribagh	Laiyo	Mandu	UG	Land possession and non-release of forest land
Kuju	Sarubera	Mandu	OC	Land authentication
	Sarubera	Mandu	UG	DGMS permission issue and loss making
	Ara	Mandu	OC	Non-authentication of non-forest land
	Kuju (outsourced)	Mandu	OC	Consent issue and release of forest land
	Pindra (outsourced)	Mandu	OC	DGMS violation and environmental clearance
	Hesagarha (outsourced)	Mandu	OC	Unspecified issue with outsourced firm

Source: As per government records and field observations

Table 5: Permanently closed mines			
Command area	Name	Block	Type of operation
Argada	Argada	Ramgarh	UG
	Sirka	Ramgarh	UG
Barka Sayal	Sayal D	Patratu	UG
	Saunda D	Patratu	UG
Kuju	Kuju	Mandu	UG
	Topa	Mandu	UG

Source: As per government records and field observations

Table 6: Major revenue from coal mining		
Year	Royalty (₹ crore)	DMF funds (₹ crore)
2015-16	**343.4 (US $47 million)**	**107.9 (US $15 million)**
2016-17	**466.6 (US $67 million)**	**139.5 (US $19 million)**
2017-18	**593.0 (US $82 million)**	**158.5 (US $22 million)**
2018-19	**583.1 (US $80 million)**	**147.0 (US $20 million)**
2019-20	**360.1 (US $50 million)**	**111.8 (US $15 million)**

Source: District Mining Office, Ramgarh, 2020

Table 7: Life of operational and upcoming mines			
Name of Mine	Operational/ Upcoming	Mineable reserves (MT)	Life of mine left (Years)
Bhurkunda Opencast	Operational	**13.9**	**9**
Bhurkunda Underground	Operational	**4.2**	**20**
Sirka	Operational	**7.9**	**7**
Rajrappa	Operational	**75.7**	**20-25**
Topa	Operational	**39.7**	**11**
Pundi	Operational	**76.8**	**35**
Karma	Operational	**10.2**	**11**
Parej East	Operational	**9.3**	**16**
Tapin North	Operational	**24.9**	**11**
Jharkhand OCP	Operational	**1.0**	**8**
Kedla Opencast	Operational	**20.3**	**20**
Kedla Underground	Operational	**39.6**	**13**
West Bokaro Ghatotand	Operational	**145.0**	**20**
Sayal D	Upcoming	**9.0**	**11**

Source: Estimated from mining plans, EIA reports and other reports available in public domain

practically the only source of revenue from coal for the district. As with production, the revenue from coal mining in Ramgarh too has declined in the last three years.

2.5 REMAINING LIFE OF COAL MINES

The combined coal resources in Ramgarh's three coalfields are estimated to be over 14.4 BT (with 9.7 BT of proven resources), and the mineable reserves are estimated to be nearly 753 MT. However, the future of coal mining remains questionable in the district. This is, particularly, for four reasons:

First, the operational mines collectively hold mineable reserves of 323.5 MT (following production up to 2019-20). If the current annual production trend is considered (13.7 MTPA), the reserves will be exhausted in about 23 years. If the operational coal mines produce as per their production capacity of 33.06 MTPA, they can be closed down in the next 10 years. The timeframe also lines up if the remaining life of the existing mines is considered. Most of these mines are very old, and the average estimated life left for them is 10 to 20 years.

Second, there is just one upcoming coal mine in the district. This is also a very small mine with an operational life of only 11 years.[6]

Third, interaction with CCL officials suggest that underground mining operations in the district are economically unviable. While all the permanently closed mines are underground, at least five underground mines are temporarily closed (such as Saunda and Sarubera) or have recorded negligible or no production in the past two to three years (such as Bhurkunda, Sirka, Pundi). These mines are loss-making and can be assumed to be closed down in the near future.

Finally, coal mining in the district is going to lose its edge increasingly. Most of the operational open cast mines are already unprofitable. Given the growing cost-competitiveness of renewable energy sources, the demand for costly coal power will sharply decline in the coming years.[7] Interaction with CCL officials revealed little interest in expanding mining operations in the district, as Ramgarh's coalfields are old and quite exploited. The focus of CCL has shifted to relatively less exploited coalfields such as those in the districts of Chatra and Latehar, where the profitability is expected to be higher.

In a nutshell, the existing coal mines and upcoming mine are likely to be closed down over the next 10 to 20 years. If no new mines are opened up, coal mining activities in the district have a life of only about 20-25 years.

CHAPTER 3

THE RAMGARH STUDY

Srestha Banerjee, iFOREST

- One-fifth of Ramgarh's GDP is contributed by the mining and quarrying sector.
- One-fourth of the households directly derive some income from coal, but a majority of them are informal workers, who earn less than US $100 a month
- Only 7% of households have a formal job with the coal industry.
- Ramgarh is an aspirationl district. Its per capita GDP is only half of India's average which makes it one of the poorest districts of the country.
- Coal mining has created isolated pockets of relative affluence in the mining areas, but the rest of the district is impoverished.
- Singular focus on coal mining has stymied the scope of development of other economic sectors in the district.

When coal mines opened, people were hopeful that they would find employment. Only some people got jobs and their living standards improved to some extent, but the rest became labourers on their own land.

—Fagu Besra, PRESIDENT, JHARKHAND COAL MAZDOOR UNIT (CCL ZONE)

3.1 OVERVIEW

Ramgarh constitutes an interesting case to understand what just transition means for India. Given its century-old history of coal mining and associated industrial activities, the district offers the opportunity to understand how the coal economy has influenced the socio-economic fabric, the dependence its the local community on coal, the distributional impact of mining in the region, and the consequences of coal mine closure. The declining coal production in the district due to the exhaustion of reserves, unprofitability, land disputes, etc. provides an excellent backdrop to understand the transition in real-time. A mix of urban and rural population (with rapid urbanisation), scattered presence of indigenous communities (such as *Santhal, Munda, Ho, Birhor*), the district's natural resource base and its geographic location (only about an hour from the state capital, Ranchi), also helps explore how social and economic development can be planned in the event of coal phase-out.

3.2 RESEARCH APPROACH

The method used for the study of Ramgarh district is based on the following:

- Literature review;
- Review and analysis of secondary datasets;
- Empirical study of Ramgarh district; and,
- Spatial analysis using Geographic Information System (GIS).

3.2.1 Literature review

The study involved a detailed review of literature on coal mining, the experience and challenges of planned and unplanned mine closure practices, the political economy of coal mining in Jharkhand and Ramgarh, and the rationale for a just transition.

3.2.2 Secondary data analysis

Secondary data were used to assess the socio-economic and coal mining scenarios in Jharkhand and Ramgarh, and to determine the risks and vulnerability of the district in the event of coal mine closure, and opportunities for a just transition.

Data were obtained from government sources, including national surveys, various departments and agencies of the central government, concerned departments of the Jharkhand government, and the Ramgarh district administration. Coal mining-related data was sourced taken from Coal India Ltd (CIL) and its subsidiary, Central Coalfields Limited (CCL).

3.2.3. Empirical study

The research has relied on a comprehensive empirical study for assessing coal dependency and the vulnerability of local communities and to capture the perspective of various stakeholders on just transition.

A primary survey, based on the following three approaches, formed the basis of the empirical study:

- Household survey;
- Focus group discussions (FGD); and,
- Semi-structured interviews (SSI).

This approach allowed the study to capture the viewpoints of most stakeholders. The detailed methodology for the empirical study is discussed in Section 3.8.

3.2.4 Spatial analysis

The research has also relied on spatial analysis tools (GIS) for the following:

- Representative sampling for household survey;
- Mapping of demographic and economic status;
- Mapping of land use and land cover;
- Evaluating the potential of agriculture and other natural resources; and,
- Representing the household survey outcomes.

3.3 ADMINISTRATIVE PROFILE AND LAND-USE

Ramgarh district was carved out of Hazaribagh district in the year 2007. The district is surrounded by Hazaribagh in the north, Ranchi in the south, Bokaro in the east, and Ranchi and Purulia (West Bengal) districts in the west. The district has six administrative blocks and 23 towns (includes Ramgarh cantonment area). There is a total of 315 villages and 257 Gram Panchayats in the district.[1] Its administrative headquarter is Ramgarh town.

The total geographical area of Ramgarh is 1360.08 square kilometers (sq.km) or 136,008 hectares (ha)[2], which is about 2% of the state's area.[3] The dominant land use is agriculture, with a gross cropped area comprising 45% of the total geographical area. This is followed by forest (29%) and wasteland, mostly coal mining areas (11%). The remaining 15% of the land is under other uses such as built-up area, current fallow land, other fallow land, pastures, etc. Rivers such as Damodar, Gomati, Swarnrekha, Narki, and Vairavi flow through the district (*see Map 2: Land use/ land cover of Ramgarh, p68*).

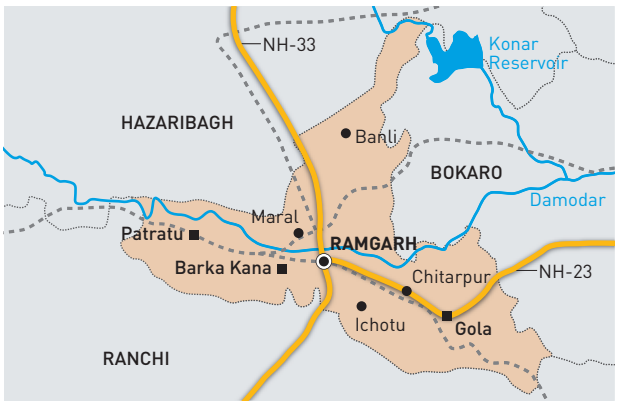
3.4 SOCIAL PROFILE

3.4.1 Demography

Ramgarh's total population (as per Census 2011) was 0.95 million, which is currently estimated to be about 1.08 million, constituting approximately 2.9% of Jharkhand's population. It is the third most densely populated district in the state, after Dhanbad and Bokaro, with about 800 persons per sq.km and is rapidly urbanising. Currently, about 48% of the district's population is estimated to be living in urban areas (*see Table 1: Demography of Ramgarh district in 2011 and projections for 2020, p69*).[4]

The four blocks where most coal mines are located – Mandu, Patratu, Chitarpur, and Ramgarh - are highly urbanised (*see Table 2: Demographic distribution of coal mining blocks, p69*). For example, in Patratu, the proportion of urban population is about 62.5%. Given the district's overall urbanisation trend and the concentration of industrial and other tertiary sector activities around mining areas, it can be presumed that the proportion of urban population in coal blocks has further increased. These blocks account for nearly 77% of the district's total population.[5]

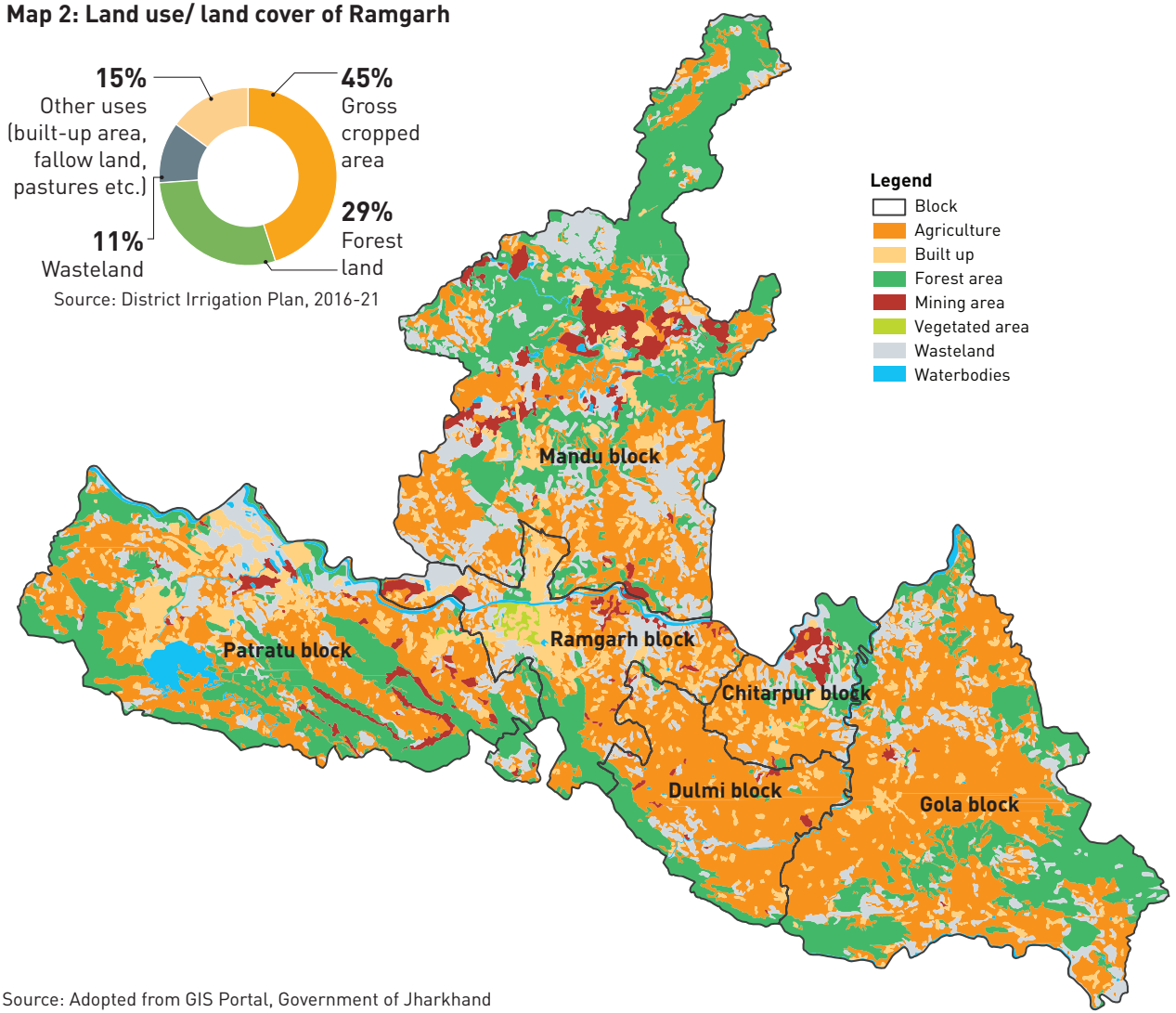
Map 1: District map of Ramgarh



Source: Adopted from Maps of India

Map 2: Land use/ land cover of Ramgarh

Source: District Irrigation Plan, 2016-21



Source: Adopted from GIS Portal, Government of Jharkhand

3.4.2 Education

Ramgarh has an overall literacy of 73.9%, which is better than the state's average of 66.4%. Literacy among males is 83.5%, which is significantly higher than the female literacy of 63.5%.[6] In the coal mining blocks, such as Mandu, Patratu, and Chitarpur, average literacy is about 75%.[7]

While the overall percentage of the literate population is decent, there are worrying trends of drop-outs post-primary levels. For example, the Gross Enrolment Ratio (GER) drops from 100% to 76% from primary to upper primary level in the district.[8] In remote blocks such as Dulmi, the drop in enrolment is even higher. The proportion of children enrolling for higher secondary education in the district is less than 50%.

The drop in enrolment rates can be explained by the poor status of education infrastructure, especially at the secondary and higher secondary level. Ramgarh has a total of 1,103 schools, from primary to higher secondary. The number

Table 1: Demography of Ramgarh district in 2011 and projections for 2020		
Description	2011	2020 estimates*
Total district population (Nos)	**949,443**	**1,082,365**
Male population (%)	**52.1**	**52.0**
Female population (%)	**47.9**	**48.0**
Urban population (%)	**44.2**	**48.0**
Rural population (%)	**55.8**	**52.0**
SC population (%)	**11.2**	**11.3**
ST population (%)	**21.2**	**21.2**
Total no. of households	**179,735**	**200,719**
Population density (persons/sq.km)	**708**	**800**

Source: Census of India, 2011; * Based on the projections for Jharkhand as per Unique Identification Authority of India (UIDAI)

Table 2: Demographic distribution of coal mining blocks					
Block	Total population	Urban population (%)	Rural population (%)	SC population (%)	ST population (%)
Mandu	**253,032**	**47.1**	**52.9**	**13.8**	**20.4**
Patratu	**247,841**	**62.5**	**37.5**	**12.9**	**26.1**
Chitarpur	**70,701**	**43.4**	**56.6**	**5.4**	**10.1**
Ramgarh	**161,821**	**70.4**	**29.6**	**11.2**	**14.7**
District total	**949,443**	**44.2**	**55.8**	**11.2**	**21.2**

Source: Census of India, 2011

Table 3: Gross Enrolment Ratio			
Block	Elementary schools	Secondary schools	Higher secondary schools
Patratu	**100**	**77.3**	**43.7**
Mandu	**100**	**97.2**	**87.6**
Chitarpur	**100**	**41.7**	**34.4**
Ramgarh	**100**	**75.3**	**59.5**
Gola	**100**	**59.7**	**35.9**
Dulmi	**100**	**35.6**	**6.3**

Source: District Education Department, 2017

Table 4: Basic amenities' access in schools	
Basic amenities	Schools having access (%)
Drinking water*	**96.3**
Girls toilet*	**97.2**
Boys toilet	**99.3**
Electricity	**75.7**
Connection through all-weather roads	**65.7**

Source: District report cards, UDISE; *Under the aspirational district programme, the district has now recorded a 100% coverage of girls' toilet and drinking water.

of government schools is 731. Besides, there are over 66 private schools, and another 306 belong to the *madrasas* and 'unrecognised' category.[9] Among private schools, 10 are supported by CCL and Tata Iron and Steel Company Limited (TISCO, currently known as Tata Steel Ltd.).[10]

Most of these schools have access to basic facilities such as toilets and drinking water (about 96%-99%), but 25% of schools do not have electricity. However, the main challenge for students is reaching the schools, as about 35% of them are not connected to all-weather roads.[11]

In addition to physical infrastructure, a key factor for ensuring quality education and learning outcomes is having the appropriate pupil-teacher ratio (PTR). As per stipulated standards under the Right to Education and the Rashtriya Madhyamik Shiksha Abhiyan, the PTR for primary and secondary levels should not exceed 30:1 and 35:1, respectively.[12] The aspirational district progress report of 2019 for Ramgarh suggests that about 86% of schools comply with the stipulated PTR.[13]

However, a critical problem with Ramgarh's education is the limited number of schools beyond the primary and upper primary levels. Only about 16% of the total schools in the district offer secondary and higher secondary education, limiting the scope of higher education for the locals. Moreover, less than 50% of these schools are government-supported, which makes education unaffordable for many.[14]

3.4.3 Healthcare

Like most coal mining districts, Ramgarh also has serious air and water pollution issues that have a bearing on the health of the local population. However, data availability on disease prevalence in the district is poor. The last Annual Health Survey (AHS) report of 2012-13 has not covered Ramgarh district separately (possibly because the district was carved out of Hazaribagh just five years ago). However, a basic understanding of the health problems that locals suffer from can be derived from health survey reports available for Hazaribagh. These studies suggest a high prevalence of tuberculosis (TB) and respiratory problems among people in the mining areas.[15] Field observations also revealed that asthma and TB are highly prevalent in the locations directly impacted by coal mining.

Further, public health studies in mining areas of the country have shown that people working in and around coal mines suffer from a specific lung disease known as coal workers' pneumoconiosis. This is caused by the inhalation of coal dust, and the severity depends on the duration of the exposure and cumulative mass inhaled.[16] Coal mine workers in Ramgarh are also likely to suffer from this disease.

The high prevalence of diseases and poor health infrastructure have made Ramgarh a priority district under the NITI Aayog's 'Transformation of Aspirational Districts' programme (in short aspirational district's programme).[17]

3.4.3.1 Healthcare infrastructure

The public healthcare system comprises infrastructure and resources for both primary and secondary healthcare. Health sub centres (HSC), primary health centres (PHC), and community health centres (CHC) together constitute primary healthcare facilities. The secondary and tertiary healthcare infrastructure comprises sub-divisional and the district hospital.

The Indian Public Health Standards (IPHS) stipulates the minimum requirements for these facilities. According to IPHS, there should be at least one HSC for every 5,000 people, one PHC per 30,000 people, and one CHC per 120,000 people in rural areas with plain grounds. For urban areas, while no detailed guidelines on public health standards have been outlined, the National Urban Health Mission (NUHM) stipulates that there should be one urban PHC per 50,000- 60,000 people.[18]

Considering IPHS as a benchmark, in Ramgarh, a considerable deficit exists in PHCs and HSCs, which are the first points of contact for rural areas and are vital to health care access. If the rural population of the district is considered, there is just one HSC per 9,000 people and one PHC per 88,000 people.[19] Evidently, the primary healthcare infrastructure is stretched beyond its capacity. All PHCs are serving two to three times their capacity. For example, in Mandu, the PHCs are serving 4.5 times over the IPHS norms.[20] This also stretches the support available at these facilities and practically renders them ineffective.

The facts are also evident from primary healthcare progress monitored under the aspirational districts programme. As of June 2020, the percentage of PHCs compliant with IPHS norms in the district remained zero.[21] As per information shared by the district administration, the district is trying to improve the primary healthcare infrastructure using District Mineral Foundation (DMF) funds. Investments have been made to upgrade the HSCs, which will also help in augmenting the PHC deficit.[22]

Public infrastructure for secondary healthcare is also below par. Ramgarh district has one sub-divisional hospital in Mandu and one district hospital in Ramgarh town, making people highly reliant on private hospitals and nursing homes for secondary and tertiary healthcare.[23]

Apart from the shortage in infrastructure, the poor availability of trained and qualified healthcare staff (including doctors, staff nurses, and laboratory technicians) worsens the situation. A 2017 study of the district's healthcare infrastructure status reported only about 60

Table 5: Deficit in primary healthcare in top coal mining blocks						
Block	Average people served per HSC	Serving over IPHS norms (1 HSC/5000 people)	Average people served per PHC	Serving over IPHS norms (1 PHC/ 30,000 people in rural areas)	Average people served per CHC	Serving over IPHS norms (1 CHC/120,000 people)
Patratu	**6,630**	**1.3 times**	**92,822**	**3.1 times**	**92,822**	**Within norm**
Mandu	**7,868**	**1.6 times**	**133,757**	**4.5 times**	**133,757**	**1.1 times**

Source: District Health Department, 2017

doctors/medical officers in-position in Ramgarh combining various blocks and municipal areas. When compared to the population of each of these blocks (considering population Census of 2011), the gross inadequacy is evident. For example, in Patratu, official estimates showed there were 11 doctors for about 0.24 million people. The situation was similar in Mandu and other key mining areas as well.[24]

Coal companies have set up their own healthcare facilities for employees and their families. CCL has five hospitals with a combined bed capacity of 242 beds and 16 dispensaries.[25] Of the sixteen dispensaries in four command areas of CCL, nine have been proposed for closure.[26]

3.4.3.2 Health insurance

While much remains to be done for the health infrastructure in the district, provisions are being made to improve access to secondary and tertiary care through health insurance schemes. In 2018, the Pradhan Mantri Jan Arogya Yojana (PMJAY) was launched that provides a cover of ₹0.5 million (US $7,000) to eligible families to avail of services at an empaneled hospital, public or private. Under the scheme, e-cards are issued to eligible beneficiaries based on a different set of conditions for rural and urban areas. The eligibility criteria are caste, lack of housing, low income, and other deprivations in the rural areas. The urban list of PMJAY beneficiaries is drawn up based on occupation.[27]

In Ramgarh, 36 hospitals are empaneled under the scheme, of which 29 are private, four are government (including one district hospital and three CHCs), and three are not-for-profit private facilities.[28] E-cards were issued to 239,559 beneficiaries, and 6,574 insurance claims had been filed for an amount of ₹17.27 crores (US $2.4 million) till June 2020. This translates into an average amount of ₹26,276 (US $365) per claim. So far, 82% of the total amount claimed had been paid under the scheme.[29]

The scheme, therefore, has resulted in a significant savings for households from poor and low-income strata while also allowing them access to specialised healthcare services. However, the scheme's eligibility criteria do not provide universal coverage and leave many households vulnerable in the absence of adequate public health infrastructure in the district. Therefore, the priority should be to enhance coverage and improve the public health infrastructure so that quality healthcare is affordable for all.

3.4.4 Women and child development

The status of child nutrition and the support available for the development of women and children (particularly below the age of 5 years) are important Sustainable Development Goal (SDG) indicators. While Ramgarh is not among the worst districts in Jharkhand regarding women and child development, some essential factors require attention.

As per available records, the average under-five mortality rate (U5MR) in the district is 35, which is much higher than the SDG target of 25 by the year 2030.[30] The bigger problem is malnutrition among a significant proportion of children below five years of age, who have stunted growth, are wasted and underweight. Nearly 71%

Table 6: Malnutrition among children below five years			
Nutritional Status	District average	Urban	Rural
Wasted (%)	**30.3**	**31.1**	**29.7**
Severely wasted (%)	**9.9**	**10.0**	**9.8**
Stunted (%)	**38.7**	**31.2**	**44.9**
Underweight (%)	**46.3**	**39**	**52.3**

Source: National Family Health Survey-4, 2015-16

An *anganwadi* (women and child development centre) in Ramgarh/ Rajeev Ranjan, iFOREST

of children between the age of six months to five years have also been recorded to be anemic.[31]

Anemia is also one of the conditions widely prevalent among women between the age of 15-49 years. On average, over 67% of women in this age group are anemic. The records do not improve for pregnant women within the same age group, as over 64% of them are anemic.[32] Clearly, the health of the mother has a bearing on the health of the child.

The issue of women and child development is dealt with under the Integrated Child Development Services (ICDS), the flagship programme of the government of India. Through the ICDS programme, the Government aims to assure six services supplementary nutrition, health education, non formal pre-school education, immunisation, health check-up and monitoring, and referral services. The first three services are primarily supported through *anganwadi* centres (AWCs), while the latter is delivered through primary healthcare services.[33]

As per 2017 estimates, on an average, AWCs in most blocks are serving two to three times the stipulated capacity under ICDS standards.[34] This has affected access to supplementary nutrition and health education. As per the district administration, the district is investing in AWCs and revamping support provided through them.[35] The District Mineral Foundation (DMF) has sanctioned over ₹3.1 crore (US $0.42 million) for malnutrition treatment centres so far.[36]

3.5 ECONOMIC PROFILE

Ramgarh's per capita GDP in 2008-09 was ₹25,938 (US $360), which was only marginally higher than Jharkhand's per capita GDP in the same year.[37] While the latest estimates of the district's GDP are not available, assuming that the per capita GDP continues to grow at the same rate as the state, it can be approximated that Ramgarh's per capita GDP in 2018-19 was about ₹76,806 (US $1,067) at current prices.[38] This is 46% lower than the country's per capita GDP of ₹142,719 (US $1,982) in 2018-19.[39]

The largest share of Ramgarh's GDP in 2008-09, about 21%, came from the mining and quarrying sector. This was almost double the share of mining and quarrying to the state's GDP, suggesting that mining plays a larger role in the district's economy than it does in the state's economy.

To estimate Ramgarh's current GDP, the district's GDP has been extrapolated from the state's GDP by the authors of this book. As the composition of Ramgarh's GDP was broadly similar to that of Jharkhand in 2009, the estimation has assumed that the growth in various sectors in Ramgarh happened at the same rate as Jharkhand from 2008-09 to 2018-19.

The estimation shows an overall decline in the contribution of the secondary sector to the district's GDP in the last decade, mainly due to the decline in the share of manufacturing. The most discernible growth has happened in the tertiary sector. In the primary sector, the contribution of agricultural and allied sub-sectors has also increased.

Nonetheless, mining and quarrying continue to be an important economic sector for Ramgarh. Its contribution to Ramgarh's GDP in 2018-19 is estimated to be about 20%. However, with a declining trend in coal production, it is quite likely that the contribution of coal mining to Ramgarh's GDP has declined more than what the projections suggest.

3.5.1 Employment status

In Ramgarh, total workers constitute only about 33% of the population as per Census 2011. Of the total workers, 71% are main workers, and 29% are marginal workers.[40] The proportion of non-workers is as high as 50% of the working-age group population (15 to 59 years). A high proportion of the non-working population combined with the significant proportion of marginal workers makes it evident that income uncertainty is high among a large

Table 7: Composition of Ramgarh's GDP in 2008-09 and projections for 2018-19

Sector	Sub-Sector	2008-09	2018-19 (Projected)*
Primary	Agriculture	**5.5%**	**8.1%**
	Forestry and Logging	**1.9%**	**3.3%**
	Fishing	**0.4%**	**0.5%**
	Mining and Quarrying	**21.3%**	**20.4%**
Secondary	Manufacturing	**19.8%**	**7.0%**
	Electricity, Gas and Water Supply	**3.0%**	**2.5%**
	Construction	**9.7%**	**9.4%**
Tertiary	Trade, Hotel & Restaurants	**10.8%**	**15.1%**
	Railways	**2.4%**	**1.3%**
	Transport by other Means and Storage	**3.9%**	**4.8%**
	Communication	**0.9%**	**2.2%**
	Banking and Insurance	**2.1%**	**3.4%**
	Real Estate	**3.6%**	**7.7%**
	Public Administration	**5.7%**	**6.6%**
	Other Services	**9.0%**	**7.7%**

Government of Jharkhand, 2009; *iFOREST estimates

section of the population (*see Box: Employment Guarantee Scheme in Ramgarh*).[41]

The labour force participation rate (LFPR) further brings out the poor employment status in the district. LFPR, which indicates the proportion of the working-age population that engages actively in the labour market either by working or looking for work, is one of the key indicators of decent work and economic well-being opportunities. The Government of India has set a target of achieving 100% LFPR by 2030 under the SDG targets.

Ramgarh is currently lagging far behind in LFPR. According to the Periodic Labour Force Survey (PLFS) of 2017-18, the district's overall LFPR is 41.3. This is even lower than the state average of 47.4.[42]

Education levels among the population have a clear bearing on the LFPR. For instance, the PLFS data shows that higher education levels, especially in urban areas, are associated with higher LFPR. In Ramgarh, the LFPR among graduates in urban areas is the highest of all groups. In fact, the LFPR of urban graduates is four times higher than the LFPR of urban population who have just completed primary education. This shows that merely being literate has not assured employment to most people, especially in urban areas, and investment in higher education is crucial to provide decent livelihoods.

Agriculture is the single largest source of employment, with 36% of the main workers in the district engaged as cultivators and agricultural labourers.[43] However, the highest proportion of main workers fall under the category of 'other workers'. This category includes people engaged in trade, manufacturing, construction, mining, health, transport, education, etc. and government jobs.

A clear distinction exists between employment and livelihood opportunities when urban and rural areas are compared. While in rural blocks such as Gola and Dulmi, most of the main workers are dependent on agricultural activities for a livelihood, in areas with a considerable proportion of the urban population, such as Patratu, Mandu, and Ramgarh blocks, about 75% to 80% of main workers are employed in 'other' sectors.[44]

Table 8: LFPR by education level

Education Level	Rural	Urban	Overall
Not literate	**34.7**	**13.6**	**33.7**
Literate and up to primary	**43.3**	**14.3**	**39.2**
Middle school	**41.5**	**33.2**	**40.4**
Secondary	**56.1**	**54.0**	**55.8**
Higher secondary	**9.5**	**36.8**	**24.1**
Graduate	**25.5**	**58.3**	**39.3**
Post-graduate and above	**100.0**	**-**	**100.0**
All included	**41.5**	**39.6**	**41.2**

Source: Ministry of Statistics and Programme Implementation, 2019

Table 9: Distribution of main workers

Block	Proportion of main workers among total workers (%)	Categories of main workers			
		Cultivators (%)	Agricultural labourers (%)	Household industry (%)	Other workers (%)
Patratu	**70.9**	**7.8**	**9.4**	**2.7**	**74.5**
Mandu	**69.9**	**17.0**	**6.3**	**6.3**	**75.0**
Ramgarh	**79.4**	**13.6**	**3.1**	**2.1**	**81.2**
Chitarpur	**81.1**	**31.4**	**10.1**	**4.5**	**54.0**
Gola	**64.3**	**56.7**	**19.6**	**2.3**	**21.3**
Dulmi	**63.0**	**60.1**	**13.4**	**2.2**	**24.3**
District	**70.8**	**26.8**	**9.6**	**2.4**	**61.2**

Source: Census of India, 2011

3.6 MAJOR ECONOMIC SECTORS

3.6.1 Agriculture

Ramgarh has 45% of its area under agriculture. Additionally, the district has two dams and five major rivers flowing through it.[45]

The majority of the households - nearly 57.3% - have agricultural landholding. The proportion of landholding is highest in Gola and Dulmi blocks, where more than 80% of the households own agricultural land. On the other hand, in the coal mining blocks of Mandu, Patratu, and Chitarpur, less than 50% of the households own agricultural land (*see Figure 1: Households with agricultural landholding, p76*).[46]

However, the average size of landholding is not very large, as 61% of it belongs to marginal and small farmers.[47] Among marginal farmers, the average operational landholding size is 1.88 acres, while that for small farmers is 3.20 acres.[48]

Agriculture in the district is mostly rain-fed. Of the total gross cropped area of 66,708 ha, only 18% is irrigated, and the remaining is rain-fed. Both *kharif* and *rabi* crops are grown. However, *rabi* crops are cultivated on a much smaller scale than *kharif* crops, with the latter occupying 76% of the total gross cropped area (*see Map 3: Agriculture in Ramgarh, p76*). Agriculture is, therefore, characterised by single-cropping practices in the district. The major crops cultivated are paddy, maize, and vegetables (potato, tomato, cabbage, cauliflower, etc.).[49]

According to local communities, the soil quality in Ramgarh is quite good. This is supported by the productivity data. For instance, paddy is one of the most widely grown crops in the district. The average yield of paddy in Ramgarh is about 3,611 kg/ha[50], which is 25% higher than Jharkhand's average of 2,890 kg/ha[51], and about 40% higher than all India average of 2,578 kg/ha.[52] Considering the lack of irrigation, Ramgarh's productivity is quite good. This also means that agriculture's potential has not been fully realised in the district.

The potential for horticulture has also been identified as significant in the district as it falls under the Eastern Plateau region's agro-climate zone. The cultivation of fruits like mango, guava, jackfruit, custard apple, sweet lime, etc. holds promise.[53]

3.6.2 Industry

Given its strategic location in the Ramgarh-Patratu-Hazaribagh industrial corridor and the presence of substantial coal mining activity, several industries have come up in Ramgarh over the years. The district has also developed two industrial areas in Ramgarh and Patratu blocks, where most industrial units are located.

Industries in Ramgarh have mostly developed around its mineral resources. The large and medium-scale industrial units include thermal power, steel and steel alloys, billets, mild steel ingots, sponge iron, and cement. Together, these units provide employment to about 5,000 people, slightly over 2% of the district's total main workers. Besides, the Patratu supercritical thermal power plant is in the pipeline and is estimated to employ 1,086 people (*see Table 10: Employment in large and medium-scale industries, p77*).[54]

Additionally, the micro, small and medium enterprises (MSME) in the district employ 5,644 people, about 2.5% of the main workers. While most of these enterprises are mineral-based, accounting for nearly 77% of the total MSME employment, there are also a number of metal-based, engineering, electrical, repairing, and servicing units (*see Table 11: Employment in micro and small-scale industries, p77*).

Overall, industries provide employment to more than 10,000 people and account for a little over 5% of the main workers.

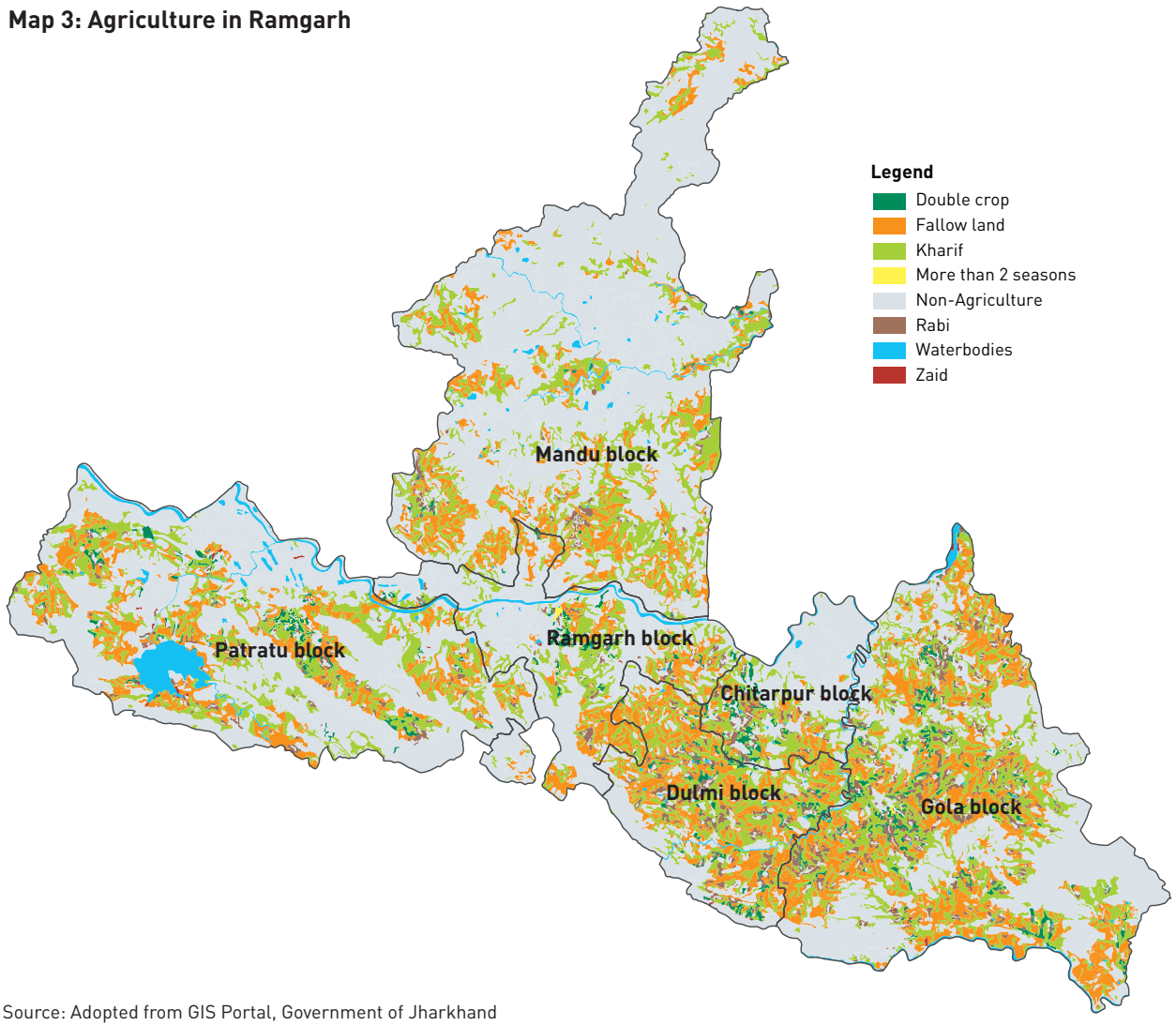
MSMEs are also being supported in the district through the MSME Development Institute of Ranchi. In 2016-17, the institute mapped the skill development needs for Ramgarh and recommended the development of jewelry and blacksmith products. The district is developing three industrial clusters for cement, jewelry, and blacksmith product manufacturing (*see Table 12: MSME industrial clusters development plan for Ramgarh, p78*).[55]

3.6.3 Mining

While Ramgarh district is known for significant mining activities, especially coal, the proportion of the working population engaged in mining and quarrying (formally) is not substantial. As per the Economic Census (2013), only about 3% of the district's working population is directly engaged in mining and quarrying.[56] This is further corroborated by the estimation of the formal coal mining workforce in Ramgarh district.

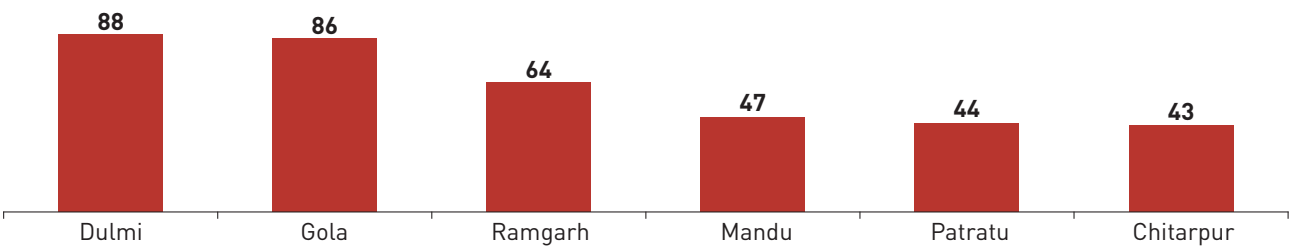
The estimation of the coal mining workforce in Ramgarh has been done based on manpower requirement per million tonnes (MT) of coal production by CCL (as no information

Map 3: Agriculture in Ramgarh



Source: Adopted from GIS Portal, Government of Jharkhand

Figure 1: Households with agricultural landholding (%)



Source: Socio-economic and Caste Census, 2011

Table 10: Employment in large and medium-scale industries			
Name of Unit	Block	Sector	Total manpower
Jindal Steel & Power Ltd.	Patratu	Steel and captive power	**1,394**
Inland Power Ltd.	Gola	Power	**310**
Bihar Foundry & Casting Pvt Ltd.*	Ramgarh	Steel	**850**
Kameshwar Alloys & Steels Pvt Ltd.	Gola	Steel alloys	**100**
Globe Steel & Alloys Pvt Ltd.	Ramgarh	Mild steel ingots	**50**
Radha Casting & Metalik Pvt Ltd.	Ramgarh	Mild steel ingots	**85**
Yash Alloys Pvt Ltd.	Ramgarh	Mild steel ingots	**70**
Vaishnavi Ferro Tech Pvt Ltd.	Ramgarh	Mild steel ingots	**30**
Dayal Steel	Mandu	Mild steel ingots	**60**
Aloke Steels Industries Pvt Ltd.	Mandu	Sponge iron	**60**
Maa Chhinnamastika Cement & Ispat Pvt Ltd.	Patratu	Sponge iron	**41**
Sri Venkatesh Iron & Alloys (India) Ltd.	Patratu	Sponge ion	**64**
Sri Ram Power & Steel Pvt Ltd.	Mandu	Sponge iron	**57**
Om Shanti Steel	Ramgarh	Sponge iron	**40**
Jharkhand ISPAT Pvt Ltd.	Ramgarh	Sponge iron; Billets	**205**
Brahmaputra Metallics Pvt Ltd.	Gola	Sponge iron; Billets	**868**
Burnpur Cement*	Patratu	Cement	**336**
SAIL Refractory Unit, Ranchi Road	Ramgarh	Refractory bricks; Steel products	**173**
SAIL Refractory Unit IFICO, Bharech Nagar	Ramgarh	Refractory bricks; Steel products	**No information**
Durga Cement	Ramgarh	Cement	**No information**

Source: Ramgarh District Industries Centre, September 2020
*Employment details from the project summary reports submitted for environment clearance

Table 11: Employment in micro and small-scale industries		
Type of Industry	No. of units	No. of people employed
Agro-based	**20**	**38**
Readymade garments and embroidery	**41**	**80**
Wood/wooden based furniture	**29**	**52**
Chemical/chemical based	**22**	**62**
Mineral based	**210**	**4,344**
Metal based (Steel fabrication)	**91**	**230**
Engineering units	**93**	**249**
Electrical machinery and transport equipment	**62**	**133**
Repairing and servicing	**78**	**232**
Others	**112**	**224**
Total	**758**	**5,644**

Source: MSME Report for Ramgarh, 2016-17

Table 12: MSME industrial clusters development plan for Ramgarh			
Industrial cluster	Products	No. of units	Proposed employment generation
Jewelry	Gold and silver ornaments	**299**	**1,100**
Mini cement plant	Portland slag cement	**42**	**1,000**
Blacksmith product manufacturing	Agricultural implements/equipment, door fittings, utensils etc.	**46**	**170**

Source: MSME Report for Ramgarh, 2016-17

Table 13: Estimated formal coal mining workforce					
Year	Manpower required per MT of CCL production	CCL production in Ramgarh	Manpower required for CCL annual production	TISCO manpower*	Manpower estimates for Ramgarh
2015-16	**712.3**	**9.0**	**6,383**	**2,200**	**8,583**
2016-17	**628.8**	**11.6**	**7,269**	**2,200**	**9,469**
2017-18	**643.1**	**10.0**	**6,400**	**2,200**	**8,600**
2018-19	**570.7**	**8.1**	**4,629**	**2,200**	**6,829**

Source: iFOREST analysis
*TISCO manpower was approximately 2,200 as of June 2020

was provided by the company on employment detail) and information obtained from TISCO. The estimation shows that the formal coal mining workforce averaged 8,370 from 2015-16 to 2018-19, which constitutes less than 4% of the district's main workers. It is also evident from the estimation that formal jobs in coal mines are declining, registering a decrease of almost 28% between 2016-17 and 2018-19. Similar observations were also made by the CCL officials during the primary survey.

However, this figure does not account for indirect employment related to coal mining. For example, people engaged in the loading or transport of coal or working as coal gatherers and sellers also directly depend on coal mines for their income. The various facets of income dependency of coal have been discussed in detail under the findings of the household survey in Ramgarh.

3.6.4 Trade

The presence of coal mines and coal-based industries has also created business opportunities in the district, which has propelled the growth of its tertiary sector. Wholesale and retail trade employed 14,321 people in 2013[57], which amounts to 6.5% of the main workers. Nearly two-thirds of these workers are present in urban areas, indicating that urbanisation has also positively contributed to this sector's growth. The nearness to the state capital provides Ramgarh an opportunity to expand this sector further.

3.7 ACCESS TO BASIC AMENITIES

3.7.1. Clean drinking water and sanitation

Decades of coal mining have adversely affected the quality of both ground and surface water resources in the district. Acid mine drainage from the mines, run-offs from overburdens, and effluents discharged by industries, especially thermal power plants, are the key factors contributing to water pollution.[58]

Data from the State Department of Water Resources shows that all coal mining blocks in the district have higher than permissible levels of nitrate in groundwater. This is a potential health risk, especially for infants.[59] Other scientific studies on water pollution in Ramgarh district (including

Employment Guarantee Scheme in Ramgarh

The Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS), a flagship scheme of the central government to provide livelihood security to rural households, ensures wage employment of at least 100 days per household annually. India has identified MGNREGS performance to provide work to households that demand it as an indicator of poverty eradication under the SDG. The target is to provide work to 100% of the households that demand it by 2030.

In Ramgarh, over the last five years, the rate of providing employment as a percentage of employment demand has averaged at 83%.

However, the trend of work demand under MGNREGS, which has been steadily increasing over the past years, suggests a worrisome trend about the district's employment opportunities. Since employment under MGNREGS is primarily demanded by the poorest households, the increase in MGNREGS work demand can be inferred as an increase in poverty and a lack of alternate employment opportunities in the district.

In the coal mining blocks, too, the demand for work under MGNREGS has been steadily increasing among rural households. This indicates that either work demand is reducing in other sectors or not enough demand is being created to absorb the new workforce.

Employment provided against employment demanded under MGNREGS

Year	Households that demanded work	Households provided with work	Households provided with work (%)
2015-16	**18,041**	**15,190**	**84%**
2016-17	**29,828**	**25,055**	**84%**
2017-18	**30,634**	**24,484**	**80%**
2018-19	**33,104**	**27,209**	**82%**
2019-20	**34,008**	**28,221**	**83%**

Source: MGNREGS MIS 2015-16 to 2019-20

Work demand under MGNREGS in coal mining blocks

Year	Households demanding work (%)			
	Mandu	Patratu	Chitarpur	Ramgarh
2015-16	**19.0**	**16.0**	**26.5**	**6.5**
2016-17	**33.5**	**28.4**	**43.4**	**12.3**
2017-18	**33.8**	**31.5**	**55.4**	**10.5**
2018-19	**38.1**	**31.3**	**54.0**	**13.7**
2019-20	**38.4**	**31.7**	**50.8**	**13.1**

Source: MGNREGS MIS 2015-16 to 2019-20

Table 14: Rural households with piped water supply			
Block	No. of households recorded as on April 2020	Total household connections reported as of June 2020	Households with piped water supply (%)
Chitarpur	**13,952**	**2,822**	**20.2**
Dulmi	**13,755**	**2,502**	**18.2**
Gola	**32,162**	**8,694**	**27.0**
Mandu	**36,877**	**5,167**	**14.0**
Patratu	**34,905**	**2,335**	**6.7**
Ramgarh	**4,266**	**1,045**	**24.5**
Total	**135,917**	**22,565**	**16.6**

Source: Ministry of Jal Shakti, 2020

sampling areas around the coal mines) have also shown the presence of heavy metals such as iron and lead above the prescribed limits. Apart from these two metals, the Rajrappa area has also recorded cobalt's presence beyond the permissible limit.[60]

The Nalkari river flowing through Patratu has been identified as one of the polluted rivers stretches in the state under the National Water Quality Monitoring Programme.[61] The Jharkhand State Pollution Control Board has also come up with an action plan for cleaning the river.[62]

Pollution aside, access to safe drinking water remains a key challenge in the district. Among government programmes, one of the major schemes in place for achieving this is the Jal Jeevan Mission under the Ministry of Jal Shakti of the Government of India. The goal of the mission is to connect every household with a functional tap and provide 55 liters of water per capita per day by the year 2024.[63]

The coverage of households under the scheme in Ramgarh so far has been minimal. Only 16.6% of the district's rural households had piped water supply connection as of June 2020. In the two major coal mining blocks, Mandu and Patratu, the percentage of households that have benefitted from this scheme is lower than the district average. While urban areas have about 60% to 70% coverage of piped water supply provided by the municipal authorities, the district administration indicated that most infrastructure is old and requires repair.[64]

A significant investment to augment piped water supply to households especially in mining-affected areas, is being made through DMF funds. The district so far has sanctioned about ₹650 crore (US $90 million) for 26 piped water supply projects.[65] Most of these projects were in progress and are expected to be completed by 2022-23.

The availability of clean drinking water continues to remain a major challenge, especially in the coal mining blocks. A significant population still relies heavily on untreated groundwater sourced through hand pumps or uncovered wells.[66]

With respect to sanitation facilities, as per government records, 100% of households in the district have individual household latrines and thus have access to sanitation facilities.[67]

3.7.2. Electricity

Electricity is the primary source of lighting for households in Ramgarh district. As per government data, 100% of the households in the district have electricity connections.[68] This is a significant achievement that will positively impact the overall development of the district.

3.7.3. Clean cooking fuel

The Indian government in 2016 launched the Pradhan Mantri Ujjwala Yojana (PMUY) to provide liquefied petroleum gas (LPG) connections to households. The programme has significantly augmented LPG connections in Jharkhand. Since 2016, more than 3.2 million LPG connections have been provided under the scheme in the state[69], including 0.1 million in Ramgarh district (as of January 2020).[70] However, the proportion of beneficiaries using LPG remains low. As of December 2018, of the

Clean drinking water is a major challenge in Ramgarh/Rajeev Ranjan, iFOREST

66,746 LPG connections provided in Ramgarh, only 47% of the consumers had returned for a refill. The number of consumers taking three or more refills was only 18,695,[71] less than 30% of the total connections. This clearly indicates that LPG's usage as a primary source of fuel in Ramgarh is relatively low.

A significant number of households in Ramgarh still rely on solid fuels (coal, firewood, and dung) as the primary source for cooking. In fact, easy availability and much lower costs of firewood and coal are the primary reasons for LPG's low usage. These facts have been captured in detail during the primary survey.

From the review of the secondary data of Ramgarh district, it can be concluded that the socio-economic status of the district remains poor. There is an urgent need to improve income and livelihood opportunities for the people, particularly considering that mining activities are showing a declining trend, which will also affect associated industries. Much improvement is also required in healthcare, women and child development, education, basic amenities (such as clean drinking water etc.), and infrastructure, vital for human development. In fact, considering the poor status of major human development indicators, the district has been taken up for priority intervention under the government's aspirational districts programme.[72]

3.8 THE EMPIRICAL STUDY

The complex fabric of the coal mining areas in Ramgarh necessitated a primary survey to understand the coal dependence, the vulnerability of people and the region in the event of coal phase-out, and aspirations of alternative livelihood. Besides, interaction with the local stakeholders was required to identify opportunities for planning a just transition that can lead to positive economic, social, and environmental outcomes. An empirical study has also been considered essential to complement and validate the secondary research findings.

This section outlines the approach and observations of the primary survey, which forms the basis of the empirical study, as conducted in Ramgarh district in the context of just transition planning.

A comprehensive primary survey was conducted over two months in June and July 2020. Three main approaches were used for the survey:

- Household survey;
- Focus group discussions (FGD); and,
- Semi-structured interviews (SSI).

3.8.1 Household survey

The main purpose of the household survey was to ascertain the coal dependence and vulnerability of local communities in the region.

A total of 406 households were selected through a stratified random sampling method at a 95% confidence level and a 5% confidence interval. To capture a broad-based representative sample and to minimise the possibility of clustering and selection bias, the following approach was adopted:

(i) Households were selected as per spatial distribution. For this the district was divided into three geographical areas based on their distance from coal mines. These included:

- Areas falling within 0-3 kilometers (km) radius from a mine (or cluster of mines) where most mining-related operations are happening and can be considered to be most (directly) impacted by the presence of mining activities;
- Areas falling within 3-10 km radius, which may be considered moderately or indirectly affected by mining-related activities; and,
- Areas falling beyond 10 km radius, which may be considered the least impacted or unaffected by mining-related activities.

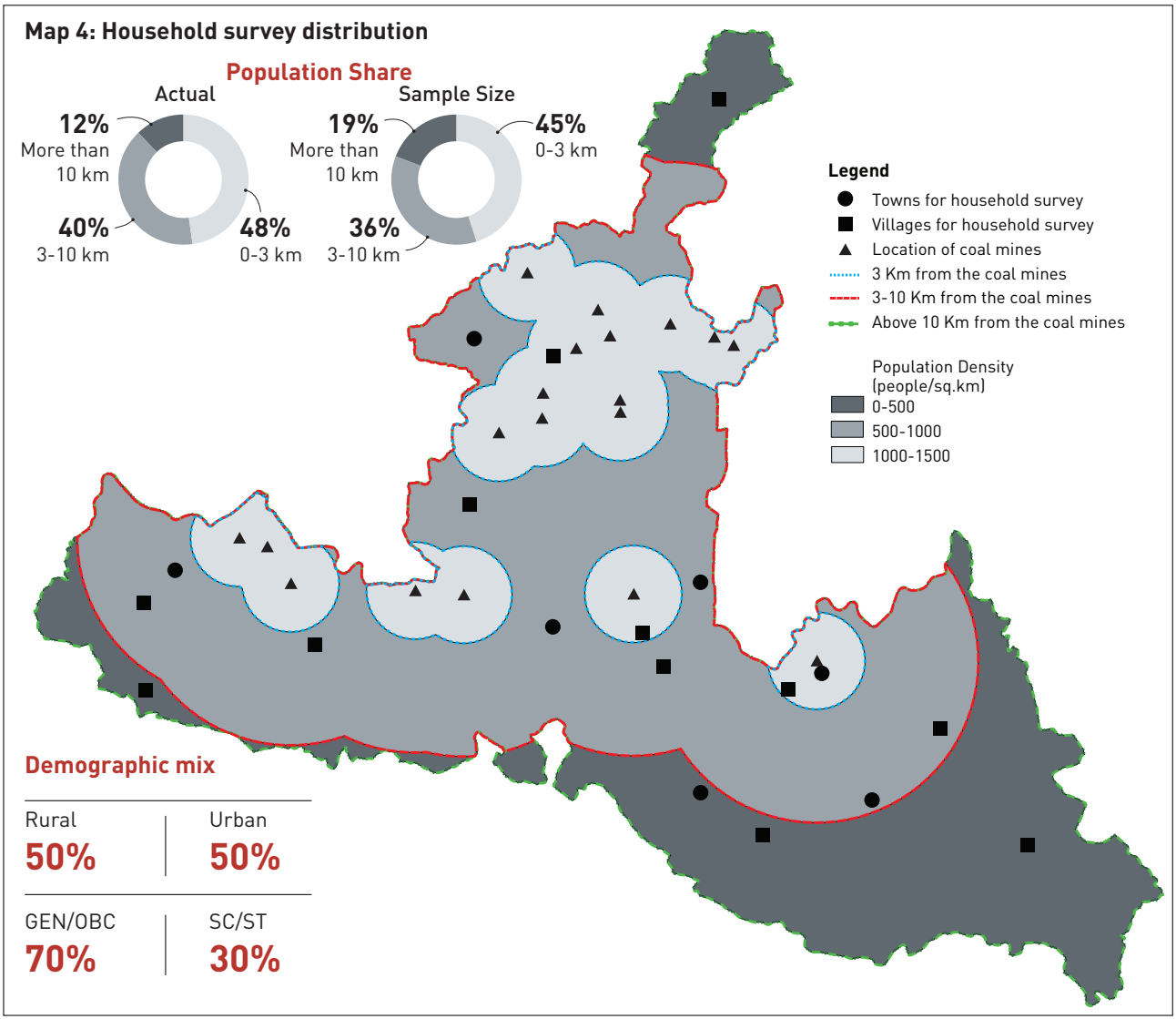
The spatial categorisation was based on the classification broadly used by Pradhan Mantri Khanij Kshetra Kalyan Yojana (PMKKY) to identify areas that are directly and indirectly affected by mining and accordingly prioritise investments for developmental activities and poverty alleviation.[73] For locating the mines and drawing the spatial boundaries around them, GIS was used.

(ii) Households were also selected to represent proportionate urban and rural population. A specific number of households was drawn from each geographical area, considering the proportion of urban and rural population of respective areas. For example, given the high proportion of industrial activities and other associated opportunities within a radius of 0-3 km the mines, the proportion of urban households within this radius was higher. Similarly, as areas beyond 10 km radius from the mines have a high proportion of rural population, the number of rural households in the sampling set was higher. Overall, the proportion of urban to rural households in the survey was maintained at around 50% each, proportionate to the overall district population (as per the estimates of 2020).

(iii) Caste representation of the district was also considered during sample selection. As nearly one-third of the district's population belongs to Scheduled Caste (SC) and Scheduled Tribes (ST) category, and the rest constitute general category and Other Backward Classes (OBC), the sample was selected maintaining that proportion.

3.8.2 Focus group discussions

FGD is a structured group review process conducted to enable participants to reveal their views, beliefs, and perceptions about issue(s) and capture their understanding and opinion objectively. For this study, FGDs were conducted with primarily three constituencies- coal mine workers (including direct/ full-time employees of the coal company, contractual workers, and informal labourers/ daily wagers), coal industry-related workers (such as truckers and drivers, coal washery workers, etc.) and Panchayati Raj Institution (PRI) members. A total number of 14 FGDs were conducted with these constituencies.



3.8.3 Semi-structured interviews

Interviews were conducted with some key personnel from Ramgarh district and Jharkhand to capture their perspectives on the importance of coal mining in Jharkhand and in the district, the consideration of coal phase-out in the context of climate change, the costs and benefits associated with such phasing out, the opportunities for a transition towards a non-coal economy, and the mechanisms for ensuring a just transition.

At the state level, interviews were conducted with the Chief Minister of Jharkhand, the Secretary of the Department of Mines and Geology, an influential Member of Legislative Assembly (Shri Saryu Roy, MLA), officials of CCL, trade union representatives, and state-level civil society groups.

At the district level, interviews were conducted with the District Commissioner, local MLAs, coal mine workers union leaders, and civil society organizations.

3.9 RESULTS AND OBSERVATIONS

The primary survey conducted with households and various stakeholder groups provided important insights on aspects of just transition. This section outlines the key questions that the survey intended to address and corresponding observations.

3.9.1 Household survey

The data and information obtained through the household survey have been analysed to evaluate:

- Coal dependency; and,
- Distributional impacts in mining versus non-mining areas.

3.9.1.1 Coal dependency

The dependence of the local communities on coal mining has been assessed based on three parameters:

- Dependence for employment and income;
- Dependence for cooking fuel; and,
- Dependence for social infrastructure.

(a) Dependence for employment and income

The coal mining-related workforce is complex and includes a variety of workers. While no formal categorisation of this workforce is available, this study has broadly categorised them as formal coal mining workers and informal workers based on their terms of employment. Also, many people derive an income from coal by gathering and/or selling it; they have been termed as coal gatherers/sellers, and are part of the informal coal economy.

The household survey shows the following:

(i) Nearly 27% of the total households surveyed were directly dependent on coal (partially or fully) for their earnings. This amounts to more than 54,000 households in the district. Of these:
   - 59% derived an income by gathering and/or selling coal, with an average household income of ₹6,000 ($83) to ₹10,000 (US $139) per month.
   - 29% had formal jobs in coal mines.
   - 8% were informal labourers, and 4% were engaged in other coal-related contractual work/businesses.

(ii) 15% of the households had coal as the primary source of income. This is equivalent to about 30,000 households in the district.

(iii) The income dependence on coal also showed a clear spatial correlation, with much higher dependence among people living close to the mines. More than 40% of the households within a radius of 3 km from coal mines derived an income from coal, which is significant. The proportion is less than 17% in the other two strata, implying that the dependence on coal for income decreases as one moves away from the mines.

All categories of people deriving an income from coal mining typically live in areas closer to the mines (within 0-3 km). However, the proportion is highest among people who either have a formal job or have mining-related businesses and contracts with coal companies (such as the truck owners or DO holders). These people are also economically better-off. The spatial correlation is comparatively less significant for coal gatherers and sellers, as they are spread across the district. Field observations suggest that people travel as far

Table 15: Categories of workforce deriving income from coal mines

Category	Sub-category	Description
Formal workers		Employed through coal companies and on their payroll
Informal workers	Contractual workers	Truck and other vehicle drivers and owners; Delivery Order (DO) holders
	Labourers	Engaged in overburden management, mine rehabilitation activities, coal washery workers etc.
		Unskilled workers involved in loading and levelling, typically on a daily wage basis
Coal gatherers/ sellers		Self-employed people who engage in coal gathering and selling, by 'illegally' extracting coal from mines.

Figure 2: Occupation of households dependent on coal

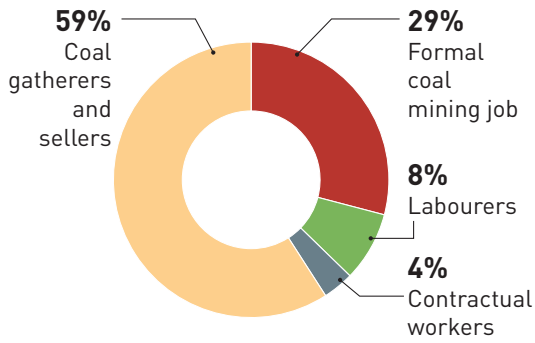


Figure 3: Spatial distribution of households deriving income from coal

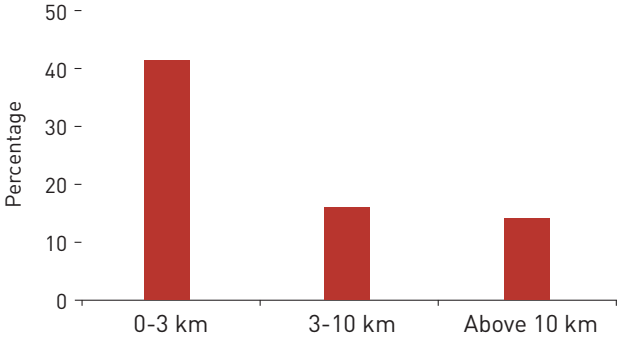
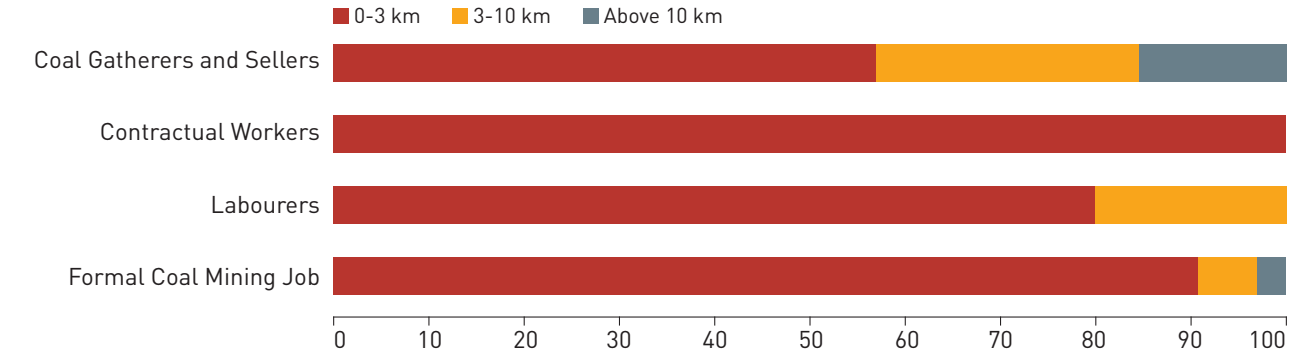


Figure 4: Spatial distribution of coal mining workforce (%)



as 10 km to 12 km to gather and sell coal.

(iv) No significant difference was observed in terms of worker/labour distribution between rural and urban areas.

The household survey results were also substantiated by FGDs, where stakeholders suggested that a major share of coal income dependents are contractual workers, casual labourers, and people 'illegally' gathering and selling coal.

(b) Dependence for cooking fuel

Coal is an important source of cooking fuel in the coal mining areas owing to its lower cost and easier availability as compared to LPG. In Ramgarh, this trend is clearly evident.

(i) Nearly 52% of the total households surveyed (amounting to more than 100,000 households in the district) used coal as the primary source of cooking fuel (*see Figure 5: Primary sources of cooking fuel, p86*).

(ii) The proportion of households using it as primary cooking fuel was significantly higher within 3 km of the mines, given the ease of procurement. In fact, nearly half (about 44%) of these households managed to source coal on their own. On average, a five-member household, using coal as primary fuel, consumed 145 kg of coal per month.

(iii) While the use of coal gradually decreased as the distance from mines increased, the use of LPG and firewood increased. The average monthly coal consumption also reduced sharply - only about 46 kg for households beyond 10 km of mines.

(iv) The average monthly coal consumption per household for the entire district was 116 kg. This is equivalent to 0.28 MT of annual coal consumption for cooking in the district.

Figure 5: Primary sources of cooking fuel

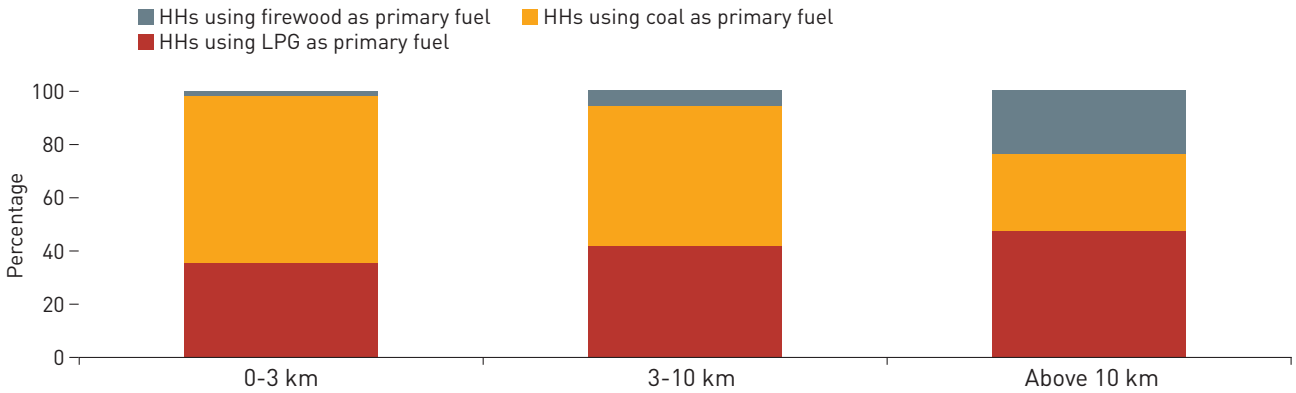
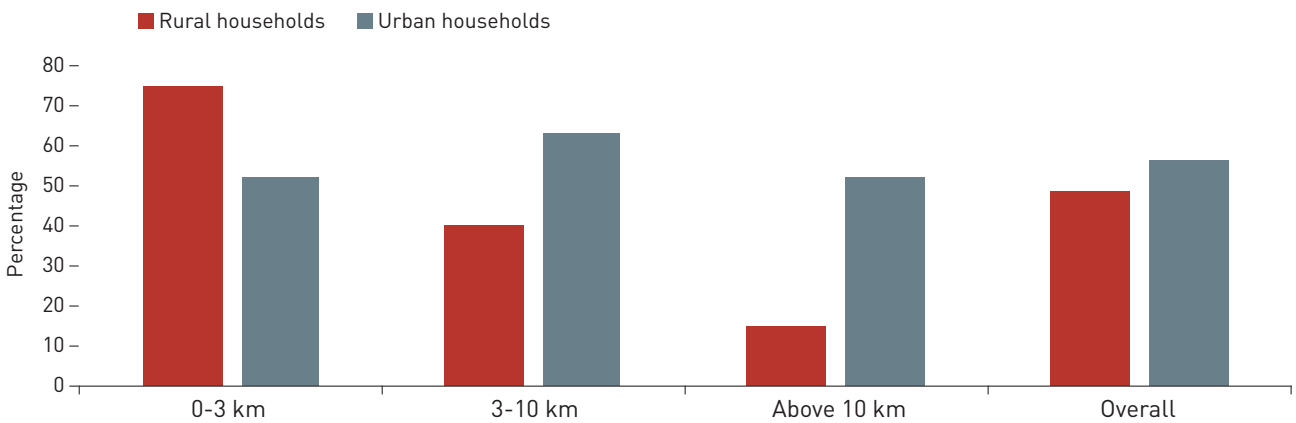


Figure 6: Coal as primary fuel in rural versus urban areas



The choice of the primary source of fuel depends on the cost and ease of procurement. This is clear from the results of urban versus rural share of coal use. The use of coal as the primary cooking fuel is slightly higher among urban households (56%) than rural households (48%). This is despite the fact that urban households have much higher coverage of LPG connections. Field observations suggest that for poor urban households, coal is the only fuel that can be self-sourced (free) or procured at a low cost. For urban households who are better-off and can afford LPG, still opt for coal because it is much cheaper than LPG.

On the contrary, coal is not cheap if it has to be purchased in rural areas. Therefore, in these areas, households typically rely on coal only if it can be self-sourced; else they self-source firewood. In fact, in rural areas beyond 10 km from the mines (such as Gola and Dulmi blocks), households even tend to use more LPG if they do not get free coal or firewood.

(c) Dependence for social infrastructure

Coal companies invest in social infrastructure in mining areas as part of their 'welfare' activities or their Corporate Social Responsibility (CSR) programmes.

The 'welfare' benefits of CCL are primarily limited to the employees. The company policy states, "welfare includes anything that is done for the comfort and improvement of employees and is provided over and above the wages."[74]

The typical areas of welfare spending include housing, healthcare, education (infrastructure support, scholarship for children of employees, etc.), water supply, and some afforestation activities.[75]

The CSR activities are geared more towards overall area development, which the company carries out within 25 km of its active mining projects (including in headquarters). Areas of CSR investments include, healthcare and child development, education, water supply, electricity, sanitation, etc.[76]

However, the survey results suggest that the direct benefits from coal companies have been minimal for the local population. The only discernible benefit comes in the form of free electricity supply. One-third of all households surveyed in the 0-3 km radius received free and reliable electricity from CCL. Households reported negligible support from companies for education, drinking water, or healthcare. Not a single household received scholarships for their children's higher education from either CCL or TISCO. Field observations suggest that handpumps initially provided by the company in many areas as their CSR measure are non-functional. Also, these benefits, whatever available, are limited to households living in close proximity to the mines (0-3 km).

3.9.1.2 Distributional impacts: mining versus non-mining areas

From the household survey, it is clear that coal mining is an important source of income in Ramgarh, especially for those living near the coal mines. However, a pertinent question remains - whether coal mining has improved the people's social and economic well-being in the mining areas. Also, considering decades of coal mining in the region, it is essential to evaluate whether coal mining has had a distributional impact in the district outside the mining areas (beyond 3 km). To understand these, the social and economic well-being in coal mining (0-3 km) and non-coal mining (beyond 3 km) areas has been evaluated based on three key parameters:

- Access to basic amenities;
- Asset ownership; and,
- Income and opportunities.

(a) Access to basic amenities

Three basic amenities have been evaluated for the purpose of this research. These include:

- Piped drinking water supply;
- Clean cooking fuel; and,
- Electricity.

Piped drinking water supply

Poor access to clean drinking water is a reality across the district, as there is no significant difference between households in the mining areas and those away from it.

(i) Only 39% of the total households surveyed had piped water supply connections. The proportion is abysmally low in the rural areas, where only 17% of the households had such access. This finding is corroborated by the Ministry of Jal Shakti's data, which shows that only 16.6% of rural households have piped water supply connections in the district. Access is significantly better for urban households, as 61.4% of households reported having piped water access.

Real versus Perceived Dependency

Overall, the household survey on coal dependence suggests that the most apparent dependence is for income, which is particularly high in areas closer to the mines. The dependence for cooking fuel is also significant as coal is considerably cheap, especially for households with limited economic means, and easily available in the mining areas. However, the dependence is extremely limited in the district for social infrastructure, except for those on the mining companies' payroll.

A noteworthy aspect of coal dependence of the local community is a palpable sense of dependence. About 27% of the households derived an income from coal, but 77% considered that coal mining in the area had a bearing on their income in 'someway'. This, in fact, reflects a 'coal-centered' life that has evolved in these old mining regions over decades and the complex economic fabric it has helped create.

(ii) Overall, 58% of the rural households reported sourcing drinking water from uncovered wells.

The observations clearly suggest that access to treated piped water depends mainly on the reach and successful implementation of government schemes, particularly in rural areas. Through their welfare or CSR investments, the coal companies have not secured a clean and adequate drinking water supply for households. Even investments on small water tanks (*jal minars*) made by the district using DMF funds over the past four years fall far short of the requirement for local communities.

Clean cooking fuel

Access to clean cooking fuel has been identified as an essential factor for advancing good health, gender equality, and human dignity by the United Nations.[77]

The survey results indicate that:

(i) The supply of clean cooking fuel, which is LPG, was overall high in Ramgarh district, and 80% of the households surveyed reported having LPG connections.

(ii) While the proportion of households with LPG connections was higher in urban areas, within 10 km from the mines, overall access is spread across the district.

(iii) Among households with LPG connections, a majority of them (55%) received it through the PMUY. Getting LPG connections through personal expenditure was reported by 38% of households. The rest either received it through CCL (as company's welfare programme) or other means (not disclosed).

(iv) There was no significant difference in LPG connections between households living near the mines and those located more than 10 km away from the mines. However, it is difficult to conclude that having LPG connection has translated into the intended outcomes of better health and well-being. As the survey results on 'coal dependence' showed, not all households with LPG connections used it as the primary cooking fuel. Households (particularly those who received LPG through government scheme) tend to rely on coal as the primary cooking fuel, despite having LPG, because coal is more affordable.

Electricity

Access to electricity is a key enabler of the social and economic development of a region and contributes to the well-being of people. Scholarly studies suggest a strong and positive correlation between proper electricity access and education and health attainments, especially in rural India.[78] Similarly, having a grid connection and reliable electricity supply (fewer outages and more hours per day) can potentially increase non-agricultural income among households in rural India by about 28.6%.[79] Presumably, reliable and affordable mini-grids can offer similar benefits.

(i) More than 99% of the total households surveyed had an electricity connection. This coincides with the government data of 100% household electrification in Ramgarh district.

(ii) The duration and reliability of electricity access, however, was observed to be higher in areas closer to the mines. Within a radius of 3 km from the mines, both rural and urban households reported more than 20 hours of electricity supply per day. The reason for such reliable supply is the assured supply of electricity to households by CCL.

The status of access to basic amenities suggests that there is no discernible difference between mining areas (areas within 3 km from the mines) and non-mining (beyond 3 km).

Figure 7: LPG connections in rural and urban households

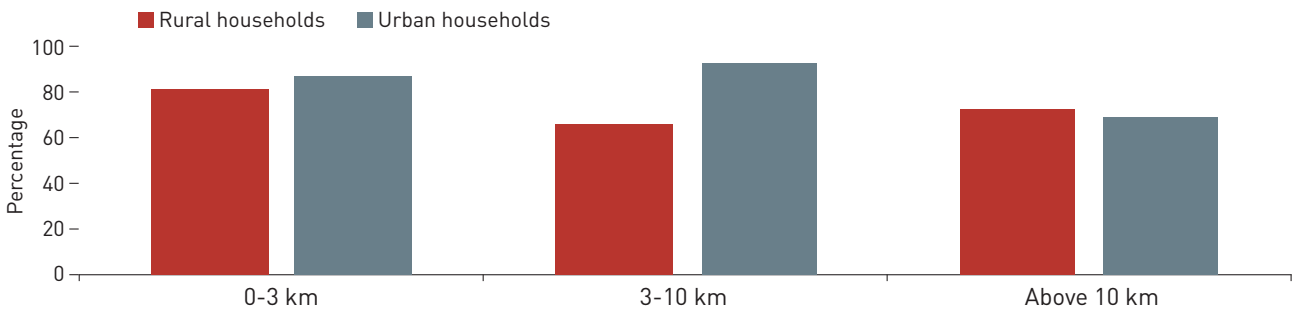


Figure 8: Average hours of electricity availability in rural and urban areas

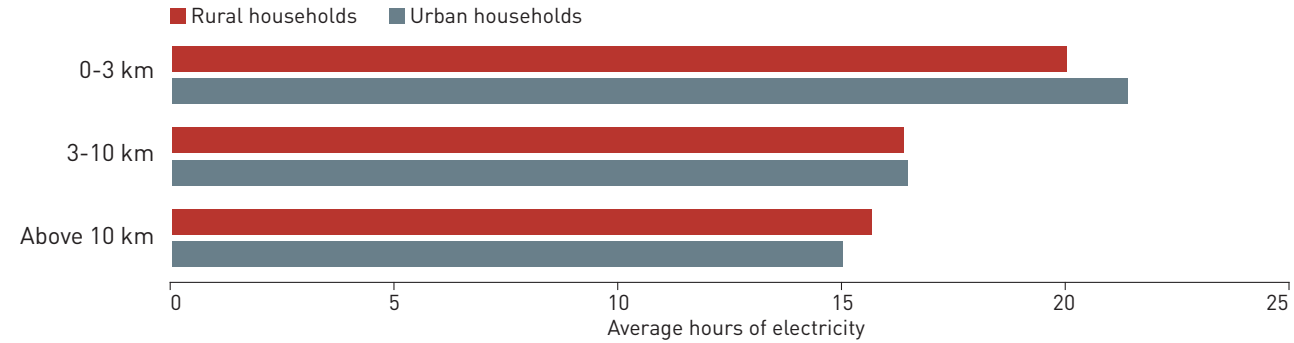
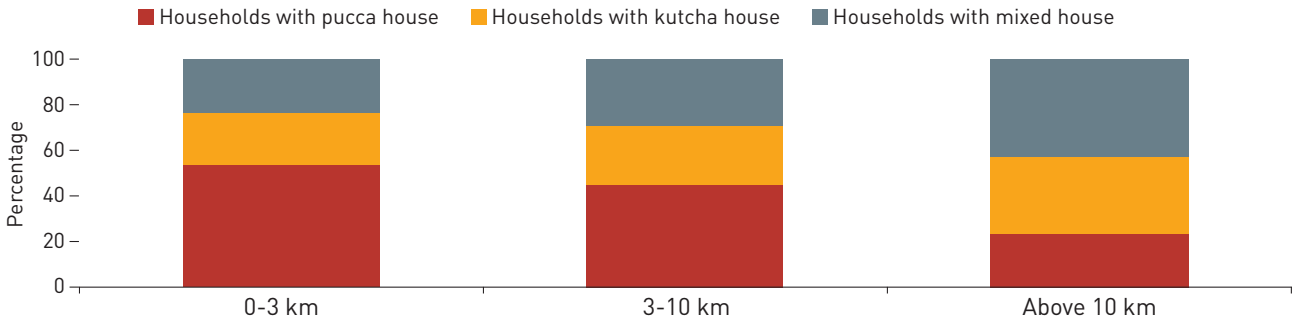


Figure 9: Housing type among households with house ownership



The availability of clean drinking water, cooking fuel, or electricity for the district's population is primarily contingent on the implementation status of government schemes and has little to do with the presence of coal mining.

(b) Asset ownership

Housing type, land, and livestock ownership are considered as key parameters of economic security and well-being. Government surveys, such as the Socio-Economic and Caste Census (SECC), also consider housing and land ownership as key indicators to identify beneficiaries for poverty alleviation programmes.

Housing

Regarding house ownership and type of dwelling (*pucca* or *kutcha* house), the survey results show that:

(i) The proportion of people owning houses in the district was overall high. About 87% of all households surveyed owned the houses they lived in. This also aligns with the observation of the SECC (2011), which showed that more than 86% of households in the district have their own houses.

(ii) House ownership was higher in the rural areas (97%), as also suggested by the SECC data (99%) data. In urban areas, it was slightly less, about 79%. This was owing to rental houses as these areas have a more floating population due to diverse economic activities.

(iii) However, less than half of the households (only 44%) with their own housing had *pucca* houses. The rest either lived in *kutcha* houses (26%) or in mixed housing (30%) that is partly *pucca* and partly *kutcha*.

(iv) Ownership of *pucca* houses also exhibited spatial correlation. Within 3 km from the mines, more than 50% of the surveyed households owned *pucca* houses. This is also the area where the highest proportion of people with formal employment in coal mines or businesses live and typically have a better and secure income. In contrast, the share of *kutcha* houses was the highest among households residing beyond 10 km from the mines. This trend was similar in rural and urban areas.

(v) For rented houses, no discernible difference was observed. The majority of households (about 65%) living in rental facilities had *pucca* housing, followed by mixed housing (27%) and *kutcha* facilities (8%).

Land ownership

Ownership of agricultural land and the size of landholding is an important indicator of the economic well-being of households (both farm and non-farm), especially in rural areas.

(i) Only 54% of the households owned agricultural land either within Ramgarh or outside the district. This is mainly owing to the low proportion of land ownership among urban households (36%). On the other hand, about 80% of households in rural areas owned land.

(ii) The size of landholdings was, however, very small among most households. The average landholding size was less than one acre for 64% of the households with agricultural land. These small landholdings are typically associated with subsistence cultivation. As per the survey responses, more than 50% of the households grew the major cultivated crops in the region – paddy, vegetables, and maize – for subsistence.

(iii) The smallest landholding was among households involved in coal gathering and selling and those employed as casual labourers. While about 60% of these households have agricultural land, on average the size of landholding is only about 0.34 acres. On the contrary, people with secure employment with the coal companies had more than two acres of landholding.

(iv) Households beyond than 10 km from coal mines had the highest ownership and size of landholding, while those living within 3-10 km had the least.

Livestock ownership

Besides landholding, livestock ownership is also considered to significantly correlate with economic well-being, particularly among farming communities.

Figure 10: Ownership and size of agricultural land holding

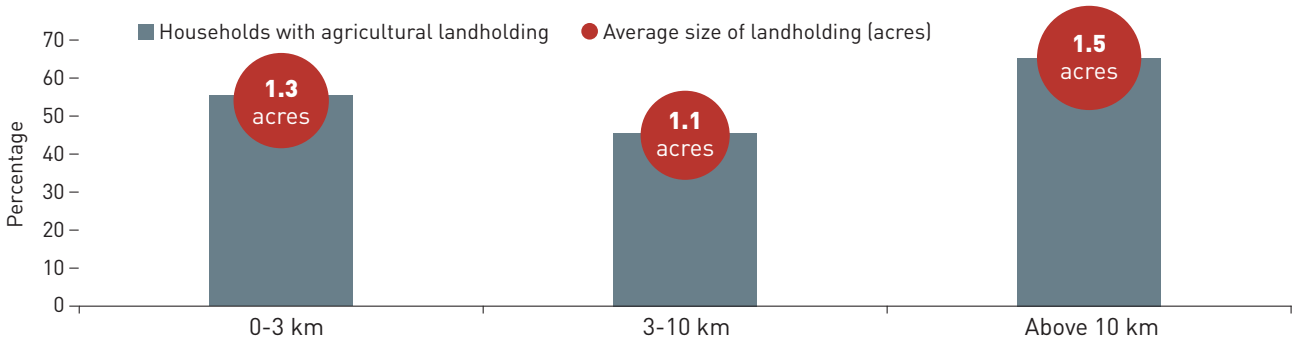
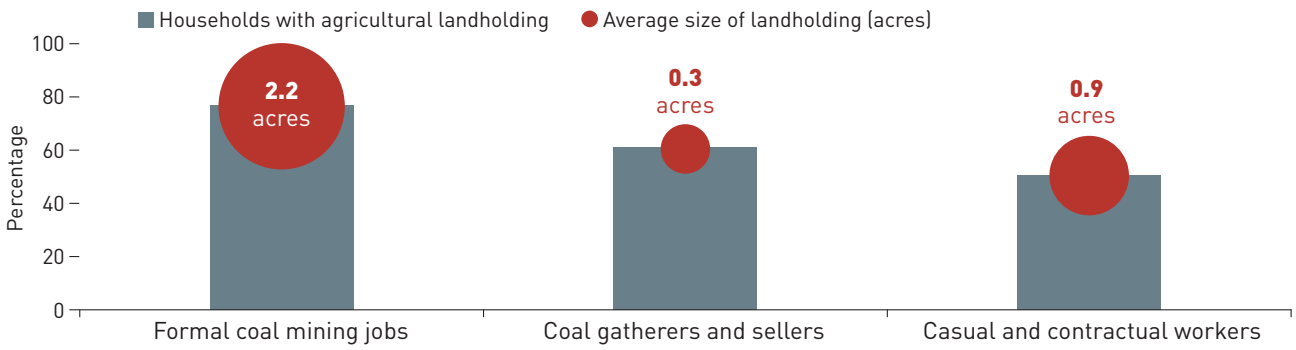


Figure 11: Agricultural landholding among coal income dependent households



(i) Nearly 49% of the households owned livestock. Owning livestock was also strongly correlated with land ownership, as more than 60% of the households with agricultural landholding had livestock.
(ii) Livestock ownership was the highest among households beyond 10 km, owing to a higher proportion of households with their own agricultural land.
(iii) Like agriculture, a significant proportion of households (about 46%) used livestock for subsistence. The rest, 54%, used it for both self-use and commercial purposes.
(iv) The use of livestock for commercial purposes is highest among households in rural areas away from the mines. Field observations suggest that livestock is used to supplement the household income.

(c) Income and opportunities

To ascertain the income of households and employment opportunities of people, the following parameters were considered:

- Type of ration cards;
- Income levels; and,
- Major income source and adult employment

Type of ration cards

The type of ration card that a household has is an important indicator of its economic status. The National Food Security Act (2013) focuses on a targeted public distribution system (TPDS) to prioritise subsidised ration for the poorest in society. This includes two categories of households - the Antyodaya Anna Yojana (AAY) households and the Priority households (as determined based on exclusion and inclusion criteria of the SECC). The AAY households are entitled to 35 kg of food grains per family per month, while Priority households (PHH) are entitled to 5 kg per person per month.[80]

(i) Almost 48% of the households had PHH cards (pink/red cards), and 16% had of them had AAY cards (yellow cards), which suggests that about 64% of the households surveyed are economically distressed. The district's official data on the distribution of ration card holders also substantiates this observation. The data shows that about 61% of the households come under PHH and AAY in the district (considering the district's household estimates for 2020).[81]
(ii) The economic status of ration card holders shows a clear spatial correlation. The proportion of households with PHH and AAY cards was the highest in areas beyond 10 km from the mines, typically rural areas with much lower income levels.

If the type of ration card is used as a proxy for income levels, then the survey indicates that households residing closer to the mines, both in rural and urban areas, are relatively better-off. This becomes clearer if the criteria of PHH, as outlined by the Government of Jharkhand, is considered.[82]

The state government's notification (2018) suggests that PHH includes those living on alms, households without shelter, and households of Primitive Tribal Groups (PTG). The criteria also include all people with 40% or more disability, those suffering from incurable diseases (like AIDS, cancer, leprosy, etc.), widows, people above 60 years of age. All these beneficiaries must not be employed or retired as an employee of

Figure 12: Ration card distribution among households

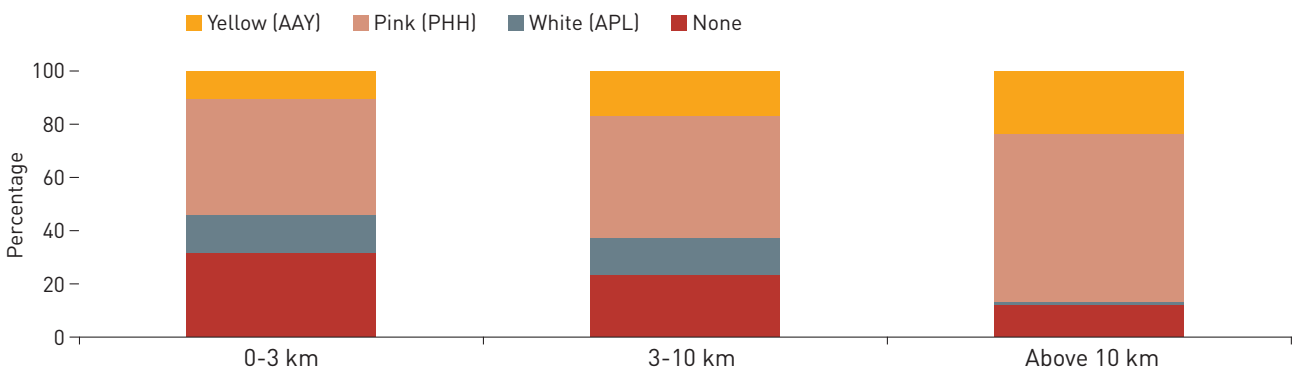


Figure 13: Income distribution among households

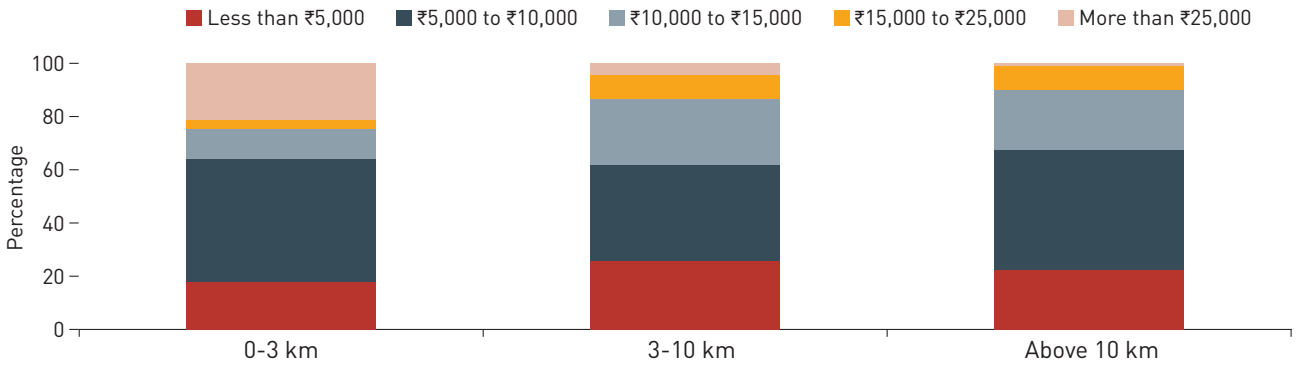
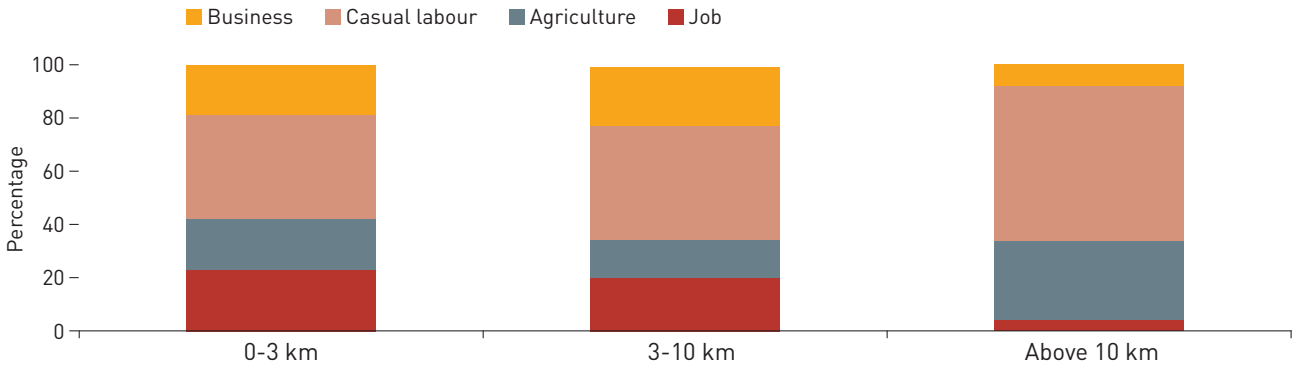


Figure 14: Household distribution as per major income source



central or state government, government subsidiaries, government-aided autonomous and local bodies. For urban areas, the notification includes people of specific low earning/wage professions such as unskilled labour, those engaged in rag picking, sweeping, domestic work, rickshaw-puller, painter, mechanic, mason, plumber, tailor, security guard, etc.[83]

Income levels

Considering that households are often uncomfortable sharing details of their earnings, data on monthly household income was collected as a range.

(i) About 63% of the total households surveyed earned below ₹10,000 (US $139) per month.

(ii) Only 12% of the households had monthly incomes higher than ₹25,000 (US $347). The rest 25% of households reported a monthly income between ₹10,000 to ₹25,000 (US $139- US $347).

(iii) The proportion of households with the highest monthly incomes was concentrated in the mining areas (within 0-3 km). This is because most formal jobs in coal mines are concentrated in these areas with monthly income greater than ₹25,000. The monthly income of formal coal mining employees on an average was reported to be at least ₹40,000 or US $555 per month and higher as per employment grades.

(iv) Similarly, it was noted that the proportion of households with an average monthly income of ₹5,000 to ₹10,000 (US $70- US $139) is reasonably similar across the district. This trend suggests that while isolated pockets of relatively high income have been created close to the mining areas, the district's overall income levels are quite low.

Major income source and adult employment

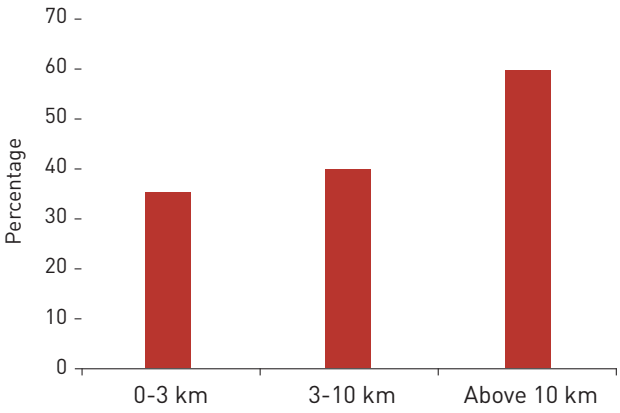
The major income source of the surveyed households has been analysed to understand the diversity of economic opportunities.

(i) Casual labour (including gathering and selling coal, as many household members are engaged in both) constitutes the major income source for 44% of surveyed households. Other major income sources were agriculture (19%), salaried, including coal mining jobs (18%), and business (18%).

(ii) An analysis of the spatial distribution of major income sources among households suggests that the diversity of livelihood opportunities is least for people living in areas furthest from the mines (beyond 10 km). In these areas, casual labour (59%) and agricultural livelihoods (30%) are the main income source. In comparison, households within 10 km of the mines have more diverse income opportunities. While casual labour dominates (about 40%), the opportunities for salaried jobs, businesses and agriculture are also high in these areas.

A noteworthy observation corresponding to the major income source is the number of adult members with an earning. While about 40% of the adults among all surveyed households had an earning, the proportion was much lower in households within 3 km from the mines and highest amongst those living above 10 km. This can be attributed to different factors, but the primary factor seems to be a combination of higher income, higher literacy and aspirations for better jobs in households closer to mines than those in non-mining areas.

Figure 15: Adult employment



Mining areas versus Non-mining areas

The overall trend that emerges from the analysis of the social and economic well-being of households in mining areas versus the non-mining areas is that, the distribution of benefits from coal mining has been unequal.

The households near coal mines are relatively well-off in terms of income. They also have lower levels of destitution and distress and higher diversity in employment opportunities. People in these areas also have better housing (*pucca* houses). The formal workers living near coal mines also have higher landholding.

The households away from coal mines (beyond 10 km) are relatively poorer, have a higher destitution level, and are mainly employed in agriculture or casual labour.

There is no discernible difference between the mining and non-mining areas with respect to access to basic amenities. This is because the access to these amenities is primarily provided through government schemes or delivery of by the local authorities. The CSR investments made by the company(s) have been extremely limited, and the welfare work as per company policies has only translated into benefits for employees who have a secure and well-placed job with the company.

It is important to stress that though the coal mining areas are better off than non-coal mining areas in terms of income and assets, they are relatively poorer compared to the national average. Overall, Ramgarh is one of the poorest districts in India.

3.9.2 FGDs and semi-structured interviews

The perception of local stakeholders on the closing of coal mines and aspirations of alternative opportunities was captured through FGDs and interviews with stakeholders at the district and state levels.

The FGD responses have been analysed using an open and axial coding approach to identify the broad indicators and evaluate further linkages between them. The frequency of ideas and prevalence of responses have been considered to develop an overall understanding of the FGDs.

The key interpretation of the FGD responses can be placed under three inter-related issues. These include:

- Importance of coal mining;
- Impacts of coal mine closure; and,
- Aspirations (or opportunities) of alternative livelihoods.

The responses against various indicators under each of the issues have been graded as high, medium, and low. 'High' indicates affirmative response from more than 60% participants, 'medium' means affirmative response from 30% to 60% participants, and 'low' means that less than 30% of participants responded affirmatively. Responses have been recorded as 'negligible' in instances where very poor or inconclusive responses were obtained. The semi-structured interviews have been used to substantiate the FGD responses.

It is to be noted that the perception of local communities on climate change was also a component of the FGD. However, less than 5% of the participants understood climate change. With respect to the linkage between coal and climate change, the understanding was far less. Community perception of this issue has, therefore, not been further elaborated.

3.9.2.1 Importance of coal mining

The perception of coal mine closure is intricately linked to how vital communities consider coal mining for their livelihoods and other socio-economic support. The responses suggest that:

- The most significant dependence on coal mining for the local community was for income, particularly around the mining areas. Interestingly, the perception of such dependence was strongest among the people who derive the least income from coal mining, such as those who gather and sell coal, the labourers engaged in loading/levelling, and those who load slurry on trucks in the coal washeries.
- Medium to high reliance on coal for cooking was identified by all constituencies.

None of the constituencies, except the formal coal mine workers, considered that coal mining in the region had assured them of any social support. Social infrastructure, such as healthcare, clean water availability, was repeatedly mentioned as key challenges in the mining areas. The benefits from the DMF funds have also been limited so far.

However, the discussions also brought out the decrease in income and employment opportunities from coal mining over the past years. This is both for informal work and formal employment.

For example, the case of loading operations came up repeatedly in this context. While loading points in the past had more than 50 'gangs' (each gang comprised 15 to 20 labourers), this had reduced significantly in the last five years due to mechanisation. The work is now primarily restricted to levelling once the coal is loaded on the trucks, which is comparatively low paying.

Another significant hit in the supply chain has been the delivery order (DO) holders, who engage a variety of labourers in turn. DO holders are typically local businessmen who get orders for several coal industry-related activities, including 'local sale' of coal. CCL carries out such sales through online auctions for 25% of a particular mine's total coal production.[84] The DO holders register for the auction and execute it. Conversations with DO holders revealed that DOs for smaller quantities (up to 200 tonnes) used to be profitable in the past. This allowed smaller businesspersons to derive an income from coal and provided employment to truck drivers and other informal workers to load and transport coal. However, they are struggling to remain competitive, as bigger businesses can deploy mechanised equipment for loading coal and rakes for transporting it. As mechanised activity is more economical than manual loading and transportation by trucks, the smaller businesspersons are losing out on cost-competitiveness.

A similar observation came from labourers of the Rajrappa coal washery, the biggest in the district. These casual labourers are also part of various gangs and rely on informal employment. Most of them identified themselves as descendants of displaced people who lost their land to mining companies long before nationalisation. Despite the loss of their land and insecure income, these people feel that coal mining can at least provide them 'some' income, without which they will go hungry.

While the situation for the labourers has worsened the most, formal coal mining jobs have also been on a steady decline. The children of retired coal mine workers have been unable to find jobs in the mines, and several of them remained unemployed despite being educated. The prospect of future coal jobs in Ramgarh seems quite limited (*see Box: Future of coal jobs in Ramgarh*).

3.9.2.2 Impact of coal mine closure

The predominant perception of dependence on coal for income makes it impossible for most people in the mining areas to imagine a future without coal mining. Even for people around the closed coal mines of Ara and Saunda, while the closing of mines in their villages has been a reality, other mining activities going around gives them hope that they can secure work related to the mining industry 'if not here then somewhere else' (*see Box: Coal mine closure experience from Saunda D*).

For most people, coal mine closure is perceived to cause both economic and social disruption. In this respect, the most discernible impacts perceived by people are:

- Immediate loss of livelihood which will push many people further into poverty, particularly those who are unskilled, poorly educated, and have no other options to look out for.
- Even for the skilled workers, concern prevailed about a significant reduction in employment opportunities (and an increase in unemployment), considering that there are not too many industries around to absorb these people.

Future of coal jobs in Ramgarh

Formal jobs in coal mines are provided through different avenues. In addition to land oustees entitled to one job for every 2 acres of land lost as per CCL's 2008 Resettlement & Rehabilitation policy and successful job applicants, sons and daughters of formal employees also receive employment in coal mines under special circumstances. However, the employment opportunities in coal mines have changed significantly over the last four decades.

Most of Ramgarh's existing coal mines were operated by private players in the pre-nationalisation era. Post nationalisation, the workers of private mines got absorbed by CCL, which accounted for the major share of CCL's employment during the 1970s and early 1980s. The manpower requirement of CCL was huge, which meant that many new workers were also recruited in addition to the workers from the privatisation era. As one existing employee put it, "Back then, the company needed so many people that they would have to literally get hold of people and put them in coal mine jobs."

The current generation of employees in CCL has received employment under different circumstances. Of the 30 households that reported a formal coal mining job in the household survey (CCL and TISCO combined), 17 articulated following circumstances:

(a). Nine of the seventeen households had inherited these jobs from their fathers, who either became medically unfit or suffered untimely death or opted for the voluntary retirement scheme during their service.

(b). Seven households had been offered jobs in lieu of the land acquired from them, of which two reported being displaced from their traditional land while the remaining continued to live on their traditional land despite losing land to the coal mines (therefore not displaced in the conventional sense of the word); and,

(c). Only one household reported getting the job through an application for a vacancy.

The practice of inheritance of jobs by the sons and daughters of formal employees has become uncommon in the current times due to a substantial reduction in manpower requirement of CCL. For instance, CCL's voluntary retirement scheme, which allowed employees to retire at 55 and provide a permanent job to their son/daughter, has been discontinued. Children of many retired employees are educated yet unemployed due to the lack of appropriate employment opportunities. Even if coal mines were to expand in Ramgarh (which seems highly unlikely given the current circumstances), employment in place of land also remains out of reach of most households: only 14% of the households surveyed meet the eligibility criteria of landholding equal to or more than two acres.

Table 16: Perception and aspiration from FGDs					
Indicators	PRI	Coal mine workers	Coal gatherers and sellers	Coal-dependent industry workers	Closed mine community
Importance of coal					
Income dependence on coal	High	High	High	High	Low
Cooking fuel	High	Medium	High	High	Low
Social support	Low	Medium	Low	Negligible	Negligible
Coal mine closure					
Income loss	High	High	High	High	Negligible
Decrease of employment options	High	High	High	High	Medium
Loss of social support	Low	Medium	Low	Negligible	Negligible
Out migration	High	Medium	Low	Medium	Low
Social instability	High	High	High	High	Low
Alternative livelihood					
Agriculture	High	Medium	High	Medium	High
Fisheries and animal husbandry	High	Low	High	Low	High
Skill training	High	High	Low	High	Medium
Self-employment/ business	Medium	Medium	Low	Low	Low
Government jobs	Low	High	Medium	High	High
Government programmes	Medium	Low	Medium	Medium	High
Industry related employment	High	High	Medium	High	Medium

- Local retail businesses would also be impacted by mine closure, as many of the small businesses, particularly around the mines, have developed because of the presence of coal mining.
- Distress migration would increase in the region, particularly for the poor, as they barely have any fallback option.
- Coal mine closure could also lead to an increase in crime and substance abuse incidents, negatively impacting the region's social stability.

3.9.2.3 Aspirations of alternative livelihoods

On the one hand, most constituencies perceived the economic loss from coal mine closure to be very high. On the other hand, many aspire for alternative livelihood opportunities, which could substitute the income loss from coal mine closure, if developed and promoted well.

Their ideas are driven mainly by the desire to have a secure income and dignified work. The choice of alternative options mentioned during FGDs clearly brings this out.

- The key sectors that most people identified as alternatives were agriculture, animal husbandry, and fisheries. Women engaged in coal gathering and PRI members particularly expressed this.
- For the young people (particularly men), skill training as per opportunities in other industries (both MSMEs or bigger manufacturing units), which the government can promote, was desirable. There was a strong demand that skill training should be linked to some assured employment.
- Self-employment opportunities were also desired by both young men and women. Women, especially those working as coal gatherers or daily wagers, opined that strengthening livelihood opportunities through SHGs can

Coal mine closure experience from Saunda D

Located in Patratu block of Ramgarh district, Saunda D is an underground mine that started operations in 1946.[1] In 2016-17, CCL Board took a decision to close eight loss-making underground coal mines in its command areas, which also included Saunda D.[2] The production capacity of the coal mine was 0.23 million tonnes per annum (MTPA), and as of April 2012, the mine had a remaining life of 30 years.[3] The production of coal from Saunda D averaged 0.048 MTPA during 2013 to 2015, which amounted to only 21% of its production capacity. The economic unviability forced the coal mine to close almost 25 years before its scheduled closure.

Discussion with the community living around Saunda D mines revealed that the closure of Saunda D did not cause any major inconvenience to the formal workforce. This was substantiated by data provided by CCL which showed that of the 549 workers that CCL formally employed in Saunda D in 2017, 464 had been redeployed to other coal mines of CCL as of May 2020. The remaining workforce has either retired or has continued to stay at CCL quarters for power and water supply maintenance.

The impact was, however, felt by informal workers/casual labourers who were left to fend for themselves. Some of these workers were able to find work to substitute their earnings, but those who couldn't, have ended up more impoverished. Coal gatherers and sellers have reportedly continued to 'illegally' collect coal from the abandoned mine. With the mine no longer in operation, it has become easier for coal gatherers to collect from the abandoned mine now, as they do not run the risk of getting caught for 'stealing' coal.

The impact on local businesses such as small neighborhood shops, pharmacies etc., located around the mine, has not been very significant, as formal coal mine workers of Saunda D have not necessarily relocated from the area. The schools supported by CCL are still functional, but the medical facilities provided by CCL have largely become defunct.[4] As per CCL records, Central Saunda Hospital was not in working condition and the dispensary in Saunda had been closed by area authorities.[5] Local communities also highlighted that Saunda D mine had been abandoned and CCL had not done any work to put the land to productive use.

The experience of Saunda D clearly shows that barring the formal workforce, CCL did not make any deliberate effort to rehabilitate the community that depended on the mine for employment and income. The 332 ha mining area has not been reclaimed either.

The mine closure plan of Saunda D stipulates disposal/dismantling of residential colony and other infrastructure within two to two and a half years of closing of the colliery.[6] Two other coal mines around the area - Central Saunda and Saunda - have also stopped production due to concerns of water-logged seams and economic viability. At some point, the abandoned mines will become out of reach for coal gatherers and sellers too. This will impact not only the informal workers but also coal gatherers and sellers and local businesses. The mining-dependent community in Saunda is staring at a crisis, but there is no just transition framework to rehabilitate them.

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[1] Central Coalfields Limited. (2014). *Six Monthly Reports of EMP Clearance [J-11015/17/92-IA.II (M)]*. Government of India Undertaking. https://www.centralcoalfields.in/pdfs/sutbs/envrmnt/Saunda%20D.pdf

[2] Lok Sabha Unstarred Question No. 902 dated February 7, 1998 https://www.coalindia.in/Portals/13/PDF/CCL_22082017.pdf

[3] Central Coalfields Limited. (2012). *Mine Closure report for Saunda D Underground Project (0.23 MTY)*. Central Mine Planning & Design Institute Limited. . http://www.mkpatna.in/MinePlan/MCP%20Saunda%20D%20UGP%200_23%20MTY.pdf

[4] Central Coalfields Limited. (2018). *Status Report of Existing Patient Care Facility in CCL*. Government of India Undertaking. https://www.centralcoalfields.in/pdfs/updts/2017-2018/03_03_2018_hospitals_disp_action_plan.pdf

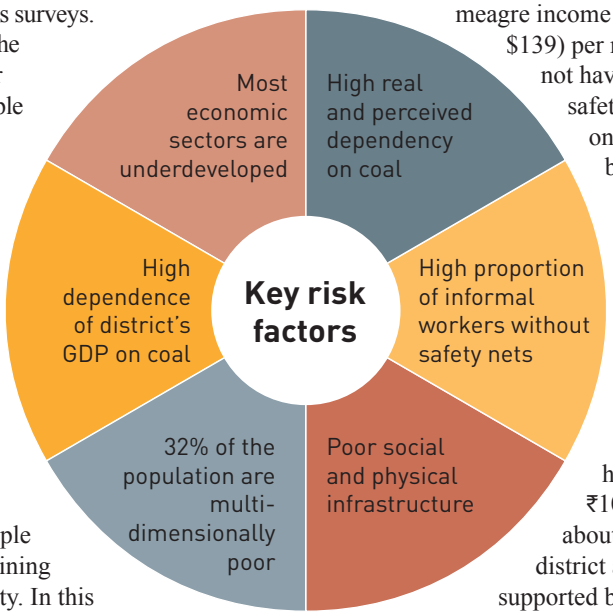
[5] Central Coalfields Limited. (2019). *Status of Dispensary*. Government of India Undertaking. https://www.centralcoalfields.in/sutbs/pdf/09_08_2019_dispen.pdf

[6] Central Coalfields Limited. (2012). *Mine Closure report for Saunda D Underground Project (0.23 MTY)*. Central Mine Planning & Design Institute Limited. http://www.mkpatna.in/MinePlan/MCP%20Saunda%20D%20UGP%200_23%20MTY.pdf

assure them income security. They also expressed that quality education will help them and their children get dignified work. At the same time, PRI leaders mentioned that the district lacked decent employment and economic opportunities for educated women.

- Reclamation of mining land for horticulture, fishery, and tourism was also identified as an important sector with significant employment potential.
- The desire for a government job was strong, particularly among people who had formal employment in coal or were engaged with the coal industry on a contractual basis for some time.

The findings of the FGDs and semi-structured interviews echoes the results of the households surveys. However, FGDs also brought out the diminishing role of coal mining for formal and informal jobs. The people in Ramgarh are aware that mines are getting closed, but they cannot come to terms with the fact that one day all the mines will be closed.



3.10 RISKS OF UNPLANNED COAL MINE CLOSURE

Ramgarh's socio-economic profile and the contour of its coal-economy have created multiple risk factors for unplanned coal mining closure, increasing its vulnerability. In this context, the following are arguably the key risk factors and vulnerabilities.

- **Coal-centric economy:** Coal remains the single largest contributor to the district's GDP, with a share of about 21%. Even with declining mining activities in recent years, coal mining continues to have a dominant position. In addition, other industrial sectors are also heavily reliant on coal, such as coal washeries, thermal power plants, sponge iron units, refractories, etc.
- **Underdevelopment in other sectors:** A coal-centered economic outlook has undermined the potential of economic diversification and the scope of investments in other sectors. For instance, only 18% of Ramgarh's gross cropped area is irrigated. Forests occupy one-fourth of the district's geographical area, but no attempts have been made to develop forest-based livelihoods. The story is similar for aquaculture and tourism, with significant potential for employment generation.
- **Income dependence:** For one-fourth of the households in Ramgarh, coal is the direct source of income. Besides, the 'perceived' sense of coal-dependence is widespread. It would take time for the community to reconcile that coal mining is likely to close in a decade or two.
- **High proportion of people in informal coal economy:** Nearly 70% of the households deriving an income from coal constitute part of the informal coal economy, with meagre income - ₹5,000-10,000 (US $70- US $139) per month. These people also do not have any labour protection, social safety net, and are highly dependent on government schemes for all basic necessities.
- **Low-income district:** Ramgarh's per capita GDP is nearly half of India's average. This places the district among the low-income category as per global standards.[85] Considering household income, over 63% of the district's households have a monthly income below ₹10,000 (US $139). Additionally, about 60% of the households in the district are economically distressed and supported by targeted government schemes of food distribution and poverty alleviation. The district has also been experiencing a steady increase in work demand under MGNREGS.
- **Poor social infrastructure:** The district has high deficit in social infrastructure. For example, the deficit in primary healthcare infrastructure and resources in the mining areas is more than 50% compared to IPHS. Equally problematic is education infrastructure, especially beyond primary and upper primary levels; only 16% of schools have secondary and/or higher secondary education facilities. Access to drinking water and clean cooking fuel is also low.
- **Poor adaptive capacity:** Inadequate education and lack of skill sets also make the local population incapable of

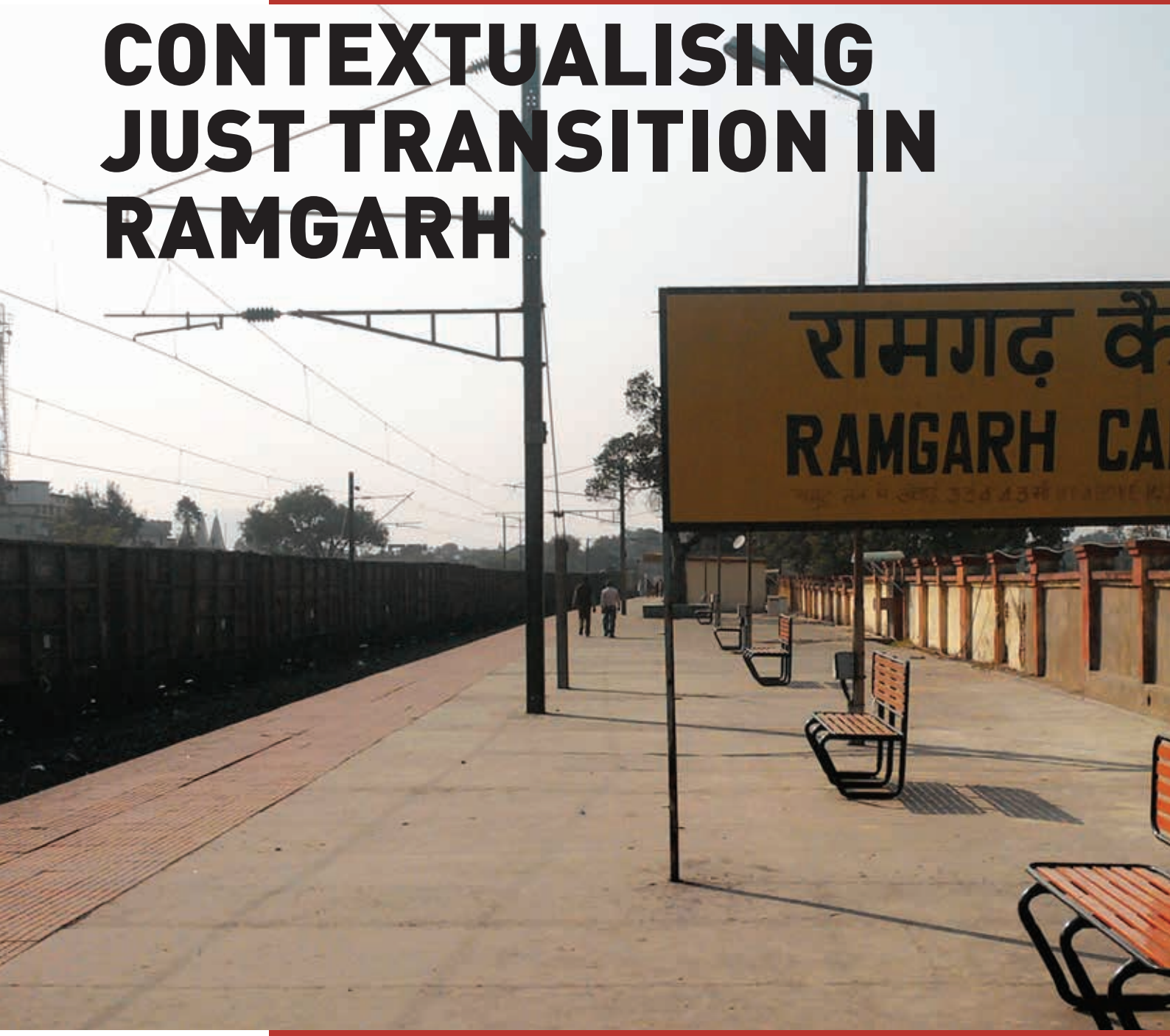
adapting to any unplanned change. Many people engaged in the informal coal economy and associated industries (such as coal washery) think coal is necessary for their survival because they do not have the required education or skills to secure a salaried and dignified job. The landholding size of these people is less than half an acre on average, limiting the possibility of developing land-based livelihoods for them.

The above analysis makes it clear that overall Ramgarh remains highly vulnerable to unplanned coal phase-out. From substitution of revenue (coal mining GDP) to diversification of economic opportunities, and development of social capital, the district will require investments and support of the state and the central government to reinvent the economy. There is also a huge need to invest in education and skill training to improve people's employability in various sectors and scope of income.

For all this, a just transition framework is required to phase out coal mining in a planned fashion.

CHAPTER 4

CONTEXTUALISING JUST TRANSITION IN RAMGARH



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- Just transition in Ramgarh is not about the future, it is here and now. Half of the coal mines are already closed and the remaining two-thirds will close within the next decade.
- A well planned just transition will provide an opportunity to reverse the resource curse.
- Diversifying the economy and building a 'new' economy and infrastructure around the resources of the district, including human resources, will be a key component of the just transition framework.
- Coal mining area redevelopment provides a massive opportunity for boosting economic activities and employment.
- DMF fund can be the seed money for starting the just transition process.

Not sure how climate change will impact us, but if coal mines close down, we will not be able to feed our family tomorrow.

—Dasmi Kumari, CASUAL LABOURER IN TAPIN NORTH COAL MINE

4.1 OVERVIEW

The case study of Ramgarh district brings out the complexities and nuances that must be considered for developing a blueprint for just transition in a coal mining district of India.

The analysis clearly reveals that the issue of just transition is not just a case of substitution of a mono industry along with its workforce. Given the high proportion of 'non-inventoried' people engaged in the informal coal economy, a linear approach can never ensure a transition where no one is left behind unfairly. Moreover, social infrastructure and safety nets must be put in place, as coal mining has not contributed to the overall upliftment of the region over the decades.

Therefore, just transition in Ramgarh must be an economy-wide process that creates sustainable and decent economic opportunities for all, phases out dependence on coal, eradicates poverty, and builds an equitable economy for the entire district. The good news is that decision-makers at the state, district and panchayat level consider that opportunities either exist or can be created to develop a non-coal economy and generate substantial employment through timely intervention.

A just transition process for Ramgarh will require a structured approach involving six key components:

- A defined timeframe for just transition;
- An inclusive transition planning mechanism;
- Developing alternative opportunities for employment;
- Economic diversification;
- Social and physical infrastructure improvement; and,
- Financial resources.

Based on these components, a just transition planning matrix for the district can be developed. As some of the factors are universal for most coal mining areas, the matrix for Ramgarh can also be an indicative blueprint for planning a just transition in other coal mining districts.

4.2 TIMEFRAME FOR JUST TRANSITION

Determining a timeframe for just transition is one of the first steps in transition planning. A well-defined timeframe of phasing out of coal mining activities is necessary for putting in place the right policies and procedures for stakeholder dialogues and facilitating the planning process.

For Ramgarh, two factors can be considered for determining the timeframe:

1. Recommendation of the Intergovernmental Panel on Climate Change (IPCC) to phase out coal power plants to meet the 1.5°C goal; and,
2. The remaining life of the existing mines and the life of the upcoming mines.

Global best practices on mine closure show that if just transition must happen, a position must be adopted that no new coal pits will further open up in the region. Therefore, in proposing the timeframe for closing coal mines in Ramgarh, opening up of new mines is not being considered.

In this context, the timeframe for just transition in Ramgarh will be 20-25 years. This is because the life of the existing and upcoming mines is in between 10-25 years. This also aligns with the IPCC timeline of closing all coal-based power plants by 2050.

Figure 1: District planning matrix for just transition

Table 1: Life of coal mines and phase-wise closure plan		
Closure phases	Mines to be closed	Life of mine left (Years)
Phase I- Time frame 10 years	Sirka	**7**
	Jharkhand Opencast	**8**
	Bhurkunda Opencast	**9**
Phase II- Time frame 10-15 years	Topa	**11**
	Karma	**11**
	Tapin North	**11**
	Kedla Underground	**13**
	Parej East	**16**
Phase III- Time frame 20 years	Bhurkunda Underground	**20**
	Rajrappa	**20-25**
	Kedla Opencast	**20**
	West Bokaro Ghatotand	**20**
	Pundi	**35** (Forced closure)

Source: Estimated from mine plans, EIA documents and other documents available in public domain.

Mine closure in Ramgarh can be planned in three phases based on the life of the mines, as shown in Table 1. For Ramgarh, by and large, a situation of forced mine closure is avoidable. Only Pundi, which has a remaining life of 35 years, will require a forced closure.

4.3 AN INCLUSIVE APPROACH TO TRANSITION PLANNING

Stakeholder dialogue and local engagement are critical components of planning a transition, considering the localised nature of impacts and subsequent measures that must be put in place. Global experiences of coal mine closure suggest that the absence of social dialogue or a top-down planning approach has not led to successful transition outcomes.

The Ramgarh case study clearly brings out the need for a participatory planning approach for just transition. Such an approach can suitably capture the extent and types of vulnerabilities of local communities to coal mine closure, their aspirations, and preparedness for alternatives, while also making the transition process fair, inclusive and transparent.

In India, district-level planning through a participatory approach was already outlined by the erstwhile Planning Commission during the Eleventh Five Year Planning.[1] The district can build on this approach in coordination with the state and central government. The just transition plan should have precise, periodic and verifiable outputs against the transition timeframe.

4.4 ALTERNATIVE LIVELIHOOD OPPORTUNITIES

Loss of income and reduction of employment opportunities will be the most significant fallout in the event of mine closure. This has clearly come out from the household survey as well as through FGDs. Identifying and creating alternative livelihood opportunities, therefore, is the foremost priority for just transition planning. Given the diversity of the coal-industry workforce and the varied types of income dependence, a multipronged approach is required to provide alternate employment opportunities to formal and informal workers.

4.4.1 Formal workers

Formal coal mining jobs are among the best-paying jobs in coal areas. Social security benefits, such as healthcare and pension, are also essential components of formal jobs.

Evidently, households with members on the payroll of coal companies are comparatively better-off compared to those in the informal coal economy. Most of these households also have larger landholdings than informal workers. The stable income flow from coal jobs has enabled several of them to invest in other businesses or housing.

Presently, in the event of temporary or permanent closure of mines in Ramgarh, the formal workers are redeployed to other coal mines of Central Coalfields Limited (CCL).[2] However, when all mines are closed in the district, it is likely that they will either be asked to relocate to other districts (if jobs are available) or take voluntary retirement and look for other jobs. Considering the declining employment trend in the coal sector, most formal workers are likely to lose their job and look for alternatives in the coming years.

To provide alternatives, four key strategies must be a part of the transition plan for formal workers:

- Retraining and reskilling;
- Early retirement options with severance benefits;
- Ensuring pension payments; and,
- Temporary financial assistance, such as mobility assistance, re-employment relief grant, etc.

However, these measures must be well aligned with other components of economic restructuring in the region. For example, retraining and reskilling should be done considering the type of industries that the region will attract or foster and the skills it might require. The state government's industrial policy can help to determine the requirement, and the state government, the district administration, and the industry should work collectively towards this.

4.4.2 Informal workers

Providing alternative livelihood opportunities and income substitution for the informal workers and coal gatherers and sellers is a far more complicated process than the formal workers. Most of these people can be categorised as semi-skilled and unskilled (except for truckers and drivers). Considering this, a broad-based approach should be adopted for securing alternative livelihood opportunities for this category. This can include:

- Government employment generation schemes;
- Employment in building the new social and economic infrastructure; and,
- Skill development.

(i) Government employment schemes

Government income support and employment schemes, such as, Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) and National Rural Livelihood Mission (NRLM), provide important livelihood and income generation opportunities, particularly for unskilled workers. However, the implementation of these schemes must be improved in the district to make them viable components of income generation. As discussed earlier, under MGNREGS, the job requirement has been steadily increasing in the district, and more than 80% of the households seeking work have got work. However, less than 5% of the households have completed 100 days of employment, and the average annual household earning has remained below ₹10,000 per year (US $139).

Women working as coal gatherers expressed interest in livelihood generation activities through self help groups (SHGs). Field observations suggest that women SHGs have not effectively taken root under NRLM in the district, including in coal mining blocks.

Improved implementation of MGNREGS and NRLM for watershed development, land reclamation, agriculture, and allied activities, through convergence with other schemes/programmes, can also enhance the district's overall natural resource potential and help build community resilience.

(ii) Employment in building the new infrastructure

Development of new social and economic infrastructure, including reclamation and redevelopment of mined areas, will be a significant component for diversifying the economy and creating long-term assets in Ramgarh. This will require the engagement of large numbers of skilled and unskilled workers. Informal workers can be suitably trained and employed for infrastructure development in various sectors. This will create direct employment, and well-planned infrastructure projects with complementary investments can also have a far-reaching benefit for the local economy.[3]

(iii) Skill development

Informal workers in coal mines are mostly unskilled, except for drivers of coal trucks and other vehicles. FGDs with unskilled workers showed a high demand for skill training, especially in the sectors of servicing and repairing (electrician, mechanic, welder, etc.), construction (masonry), information and technology (computer operator, office jobs), and transport (driving).

Given that Ramgarh is an aspirational district, these informal workers can be covered under the skill development component of the aspirational districts programme. Acquiring new skills can improve the scope of employment opportunities for them. However, most of these people are middle-aged, limiting their ability to develop new skills or get educated. An inter-generational just transition approach requires that their children are not trapped in the same vicious cycle of poverty. This is also where investments in quality and affordable education and skill-building infrastructure becomes crucial.

4.5 ECONOMIC DIVERSIFICATION

Ramgarh's natural resource base has significant potential to enhance income and livelihood of the local community. In this section we review some of the sectors and mechanisms through which the economic base of the district can be diversified.

4.5.1 Agriculture and allied activities

Agriculture emerged as the most important sector with livelihood potential. Inputs received from community representatives and district administration suggest that agriculture and allied activities (such as horticulture and animal husbandry) can substantially improve household incomes, considering the quality of agricultural land and local skills.

The analysis of district data on land use-land cover and agriculture-based livelihoods also indicates this sector's potential. Both secondary data and the survey results suggest that a very significant proportion of the households have agricultural landholdings.

Despite a high proportion of households owning agricultural land and the reasonably good agricultural land quality, the district's agricultural productivity has been suboptimal. This is due to the poor status of irrigation and single-cropping practices.

For example, Ramgarh's current water budget shows that against the total annual water demand of about 547 million cubic meter (mcm), 86% is for crop production. However, the total water availability is only 110 mcm (of this 0.03 mcm is groundwater and the rest surface water), resulting in an overall unmet demand of about 437 mcm. Therefore, there is a gross deficit of water for crop production. This is reflected in the lower irrigation coverage of the district.

The district's agriculture and irrigation data (as discussed earlier) show that, of the total gross cropped area of 66,708 hectares (ha), only about 18% is irrigated. This makes agriculture substantially dependent on rainfall, which even official records acknowledge makes cultivation a 'high risk' and 'less productive' proposition.[4] In fact, lack of irrigation was highlighted as a key impediment to agriculture during focus group discussions.

Going ahead, the agriculture potential of the district must be improved. To this effect, there are two plans that the government has developed: district irrigation plan, and the action plan for the development of the district's land resources.

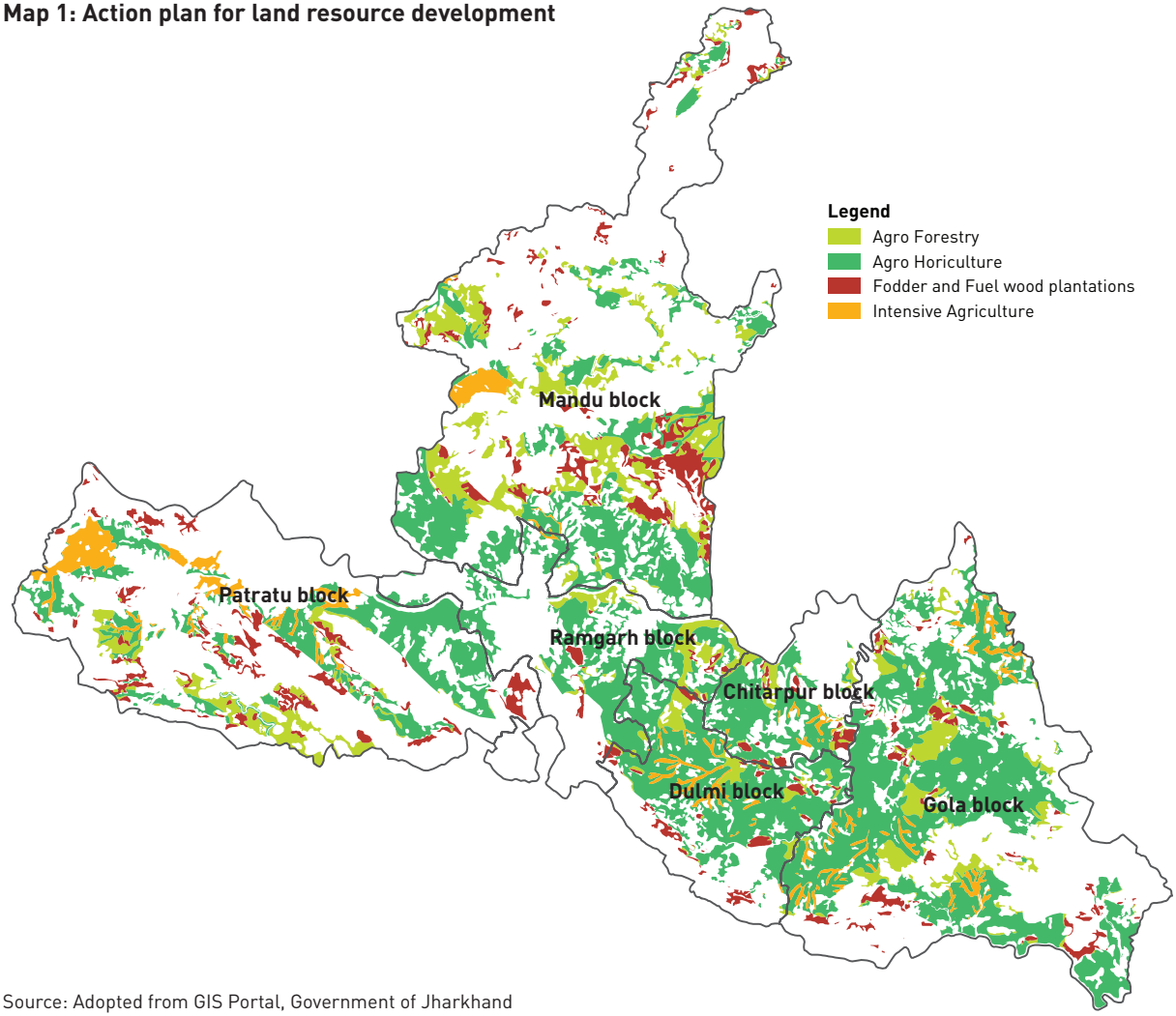
The five-year district irrigation plan (2016-2021) has been developed under India's flagship scheme, the Pradhan Mantri Krishi Sinchayee Yojana (PMKSY), rolled out in 2015. Aligned with the scheme's focus, the plan aims to increase irrigation coverage, improve water use efficiency, and water availability in the district to boost agricultural productivity. It also includes components of integrated watershed development and convergence with MGNREGS to scale up implementation. The plan aims to bring together the programmes of various departments to improve agricultural productivity.

The district action plan for land resource development also identifies areas for intensive agriculture, agro-forestry, horticulture, and plantations of fodder and fuel. The action plan shows that while intensive agriculture potential is limited to certain pockets, the potential of agro-forestry and horticulture is spread throughout the district, including in coal mining areas such as Mandu and Chitarpur.

The district irrigation and agricultural plan considered together show high potential to improve agriculture, agro-forestry, and horticulture activities. However, significant investments must be planned for this. For example, it is clear from the irrigation plan that irrigation coverage for agriculture will have to expand in a big way in the coming years. It has been estimated that if the total gross cropped area must be brought under irrigation, over 304 mcm water will be required.[5] Sustainable irrigation should, therefore, be a key focus area of the government's investment.

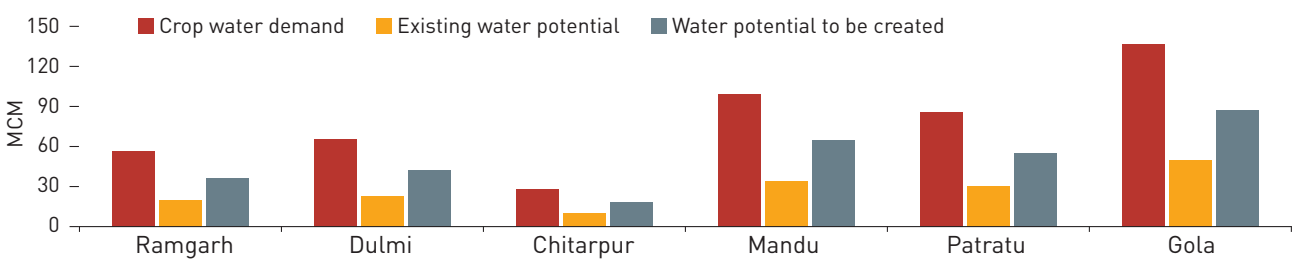
Besides agriculture, animal husbandry also has a considerable demand among rural households for income generation. This demand is driven by the market for

Map 1: Action plan for land resource development



Source: Adopted from GIS Portal, Government of Jharkhand

Figure 2: Block-wise crop water demand versus existing water potential



Source: District Irrigation Plan 2016-21, Ramgarh

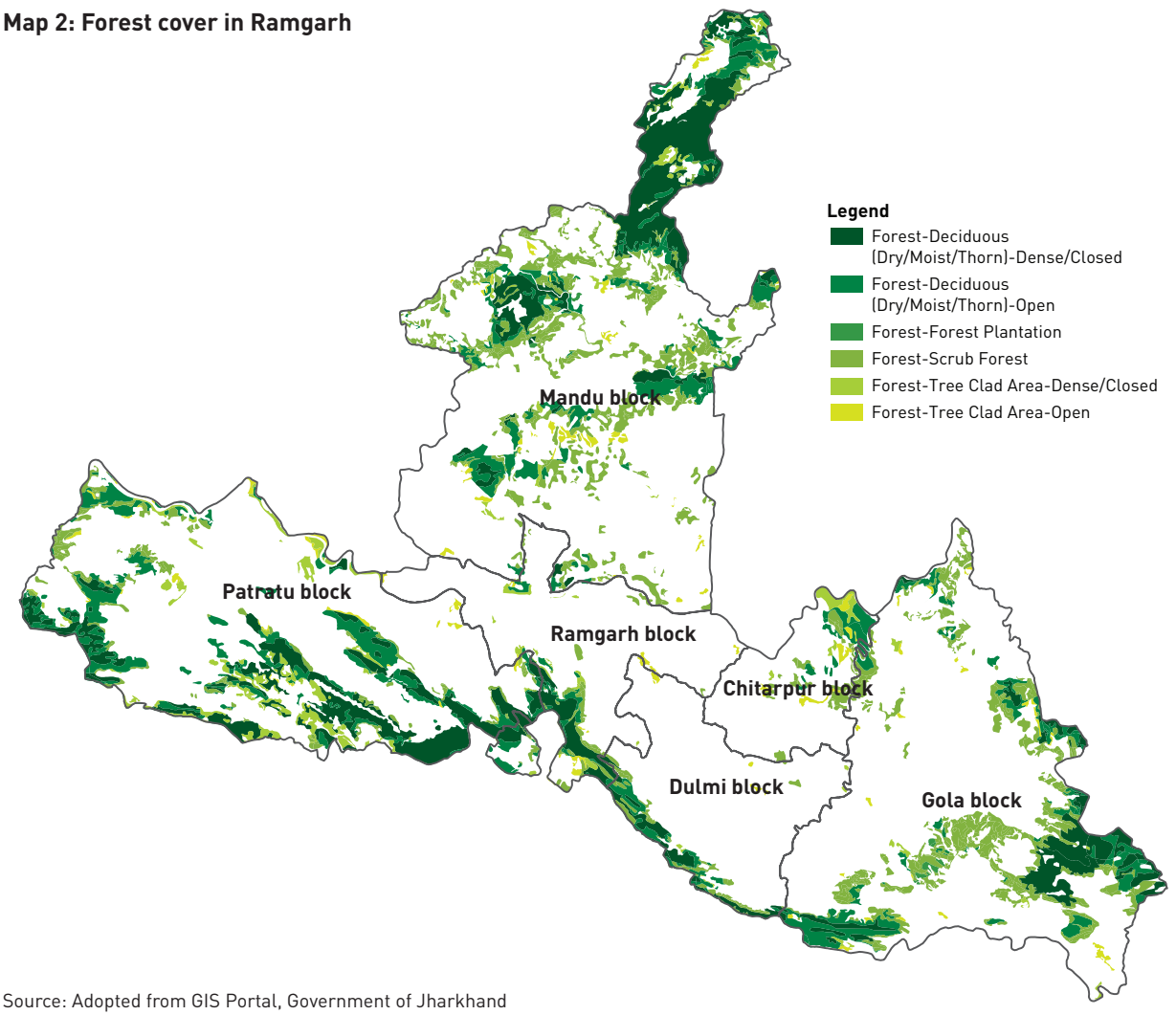
livestock products in the district, evidenced by the high proportion of households that use livestock for income generation. Animal husbandry can also be promoted further through loans and support to SHGs.

4.5.2 Forest-based livelihoods

The total land under forests in Ramgarh is 38,900 ha[6], and the forest cover of the district, which includes both forest and non-forest land, is 32,900 ha (about 24% of Ramgarh's geographical area). More than 57% of the district's forest cover is open forest.[7] It is, therefore, evident that much of the forest land in Ramgarh district is degraded.

Forests in Ramgarh are largely concentrated in pockets. Some of these pockets can also be found around coal mining areas of Mandu and Chitarpur blocks. The forests are said to be rich in both timber and non-timber forest products (NTFPs). Among timber species, the most widely occurring are shisham (*Dalbergia sissoo*), sal (*Shorea Robusta*), bargad (*Ficus benghalensis*), chakunda (*Cassia*

Map 2: Forest cover in Ramgarh



Source: Adopted from GIS Portal, Government of Jharkhand

tora) gamhar (*Gmelina arborea*), tamarind (*Tamarandus indica*), mahua (*Madhuca Indica*), jamun (*Syzgium cumini*), etc. Timber is harvested by the Jharkhand Forest Development Corporation, but the total production from major timber species is insignificant - only 80.65 cum was harvested in 2014-15.[8]

Among NTFP species, mahua flowers, sal leaves, karanj, medicinal plants, and forest fruits are collected by the local communities, especially the tribal communities, for subsistence and commercial purposes. While bamboo is also abundantly available, field observations suggested that it was not sold commercially.

The enumeration of livelihoods based on forest resources is, however, extremely poor in the district. At the time of this research, no information could be obtained from the district on the settlement of forest rights, particularly community forest rights, which is important for improving forest-based livelihoods. Neither any specific government estimation could be obtained for the potential of NTFPs for income generation in the district.

However, interactions with community representatives suggest that the forests are well endowed with NTFPs, and potential exists to generate income and employment from these resources. Ramgarh needs to develop a detailed plan to sustainably manage its forest resources and generate livelihood for the local communities.

4.5.3 Aquaculture

Aquaculture is becoming a popular source of employment among rural youth in Ramgarh. As of July 2020, the district had three major fish farms located in Patratu, Ramgarh, and Gola blocks. In addition to fishermen, this sector also provides employment and income to seed growers. Ramgarh had 142 seed growers and nine fishermen cooperative societies at the time of this study.[9]

The average annual production of fish in the district was 3,100 metric tonnes, which constituted only 1.4% of Jharkhand's total fish production in 2019-20.[10] However, field observations and interactions with district administration suggested that efforts are underway to promote fish farming in the district, especially in the abandoned coal mine pits, which are now water reservoirs. Cage culture in the district's coal pits has been identified as an important aquaculture activity by the State Directorate of Fisheries. The district fisheries department has also set up a fish feed mill, estimated to produce two metric tonnes of fish feed per day.[11]

Ramgarh district has tremendous potential to augment aquaculture as a part of mine reclamation and income generation. Undertaking aquaculture in flooded pits and tailing ponds has been observed to improve economic opportunities for local communities once mines have closed. Besides income generation, such activity can improve the region's food security and attract recreational activities.[12]

4.5.4 Mine reclamation and land redevelopment

Once coal mines close in Ramgarh, the district will have more than 14,000 ha of mining land available at its disposal. This is a little over 10% of the district's geographical area, which is significant. Mine reclamation and land redevelopment are crucial for expanding the scope of economic opportunities. The district must develop a coal mining area redevelopment plan for this.

Land reclamation for productive use by local communities is increasingly gaining importance in just transition planning. Several best practices on mine reclamation exist from across the world and within India. For example, open mine pits can be converted into aquaculture ponds. Mining sites also can be developed for tourism, recreational facilities, agro-forestry, horticulture, plantations, etc. Ramgarh can learn from these experiences and adapt them to suit its unique needs.

However, land reclamation is easier said than done. The costs of land reclamation often tend to be higher than the amounts deposited by mining companies for mine closure. While the Ministry of Coal revised the costs in 2019, the practice of proper mine closure is yet to be observed. Implementation of mine reclamation policies thus must be strengthened to realise the potential of reclaimed land.

Moreover, for communities to derive long-term livelihoods from the reclaimed lands, their rights on these lands will need to be defined clearly (which can be in the form of long-term user rights). This will be a policy level discussion that has to be taken at the state and central level. Deliberations are also needed on the ownership and use of the infrastructure set up by coal companies, especially hospitals, schools, staff quarters, etc. Therefore, clear guidelines are needed for land reclamation and mine area redevelopment.

4.5.5 Industrial restructuring

Global best practices of coal mine closure, suggest that a well-designed industrial restructuring plan can facilitate a transition with minimum economic disruption. An industrial restructuring plan needs to be developed for Ramgarh in coordination with various actors.

Discussions with panchayati raj institution (PRI) representatives, and local community members have provided some insight regarding the key sectors that may be prioritised. One of the potential sectors is tourism. The district has potential for nature tourism, 'temple' tourism as well as educational tourism. While the Patratu dam and the Chinnamastika temple are the top tourist destinations in Ramgarh, the district also has several waterfalls and valleys where eco-tourism initiatives can be taken up. The development of geological parks in some of the abandoned coal mining sites, based on feasibility, was also identified as a tourism option. This will not only rehabilitate these sites but also create a unique educational experience for visitors.

Renewable energy, agro-forestry based industry, fisheries, and dairy industry were also identified as potential sectors by the local stakeholders. Besides medium and large industries, there is a huge potential for small and micro-enterprises such as agro-processing, artisanal units, livestock-based units, both in rural and urban areas.

4.6 SOCIAL AND PHYSICAL INFRASTRUCTURE

A key focus of just transition planning in Ramgarh should be the development of social and physical infrastructure. Social infrastructure investments should include the development of educational institutions (including higher education), vocational training schools, nursing schools, medical colleges, healthcare facilities (including multi-specialty hospitals), etc. Investments in education, in fact, have remained one of the key demands from worker unions worldwide for just transition as it improves employability and the means for a decent income. In Ramgarh, investment in education and skill-building becomes even more relevant, given its proximity to Ranchi, the state capital. The demand for the service industry is growing steadily in the capital city and provides a good opportunity for educated and skilled youth from Ramgarh to find employment in Ranchi.

Developing infrastructure for water, energy supply, connectivity, and urban amenities, is also necessary to support the district's service sector and improve its investment potential, both for private and public entities.

Most of these social infrastructure development investments can be planned through state budgets, district funds such as District Mineral Foundation (DMF), and convergence of funds earmarked for such sectors through government schemes.

4.7 FINANCIAL RESOURCES

One of the key challenges for just transition worldwide has been securing the funds for transition. In the Netherlands and Germany, the federal governments shouldered the major share of fund contribution. In India, however, the funds will have to come from both the public and the private sector. In fact, public funds will have to be used as a catalyst to attract private investments in infrastructure and industries.

Given India's governance structure, revenue and expenditures are decentralised at two levels- the Centre and the State. While the Centre has most of the revenue generation avenues through major taxes, state governments carry out most of the development and welfare-oriented expenditures such as, agriculture and industry, providing social sector services like healthcare and education, developing state roads and infrastructure, etc.[13] The budget for these comes through the state's own revenue and central schemes.

Besides, districts also have certain revenues directly accruing to them. In the context of mining, the key revenue source is from the DMF. The district is supposed to use the DMF funds in a targeted manner in mining areas to develop social infrastructure, improve human development indicators and alleviate poverty.

For just transition funding, therefore, all levels of the government will have a role to play. However, it is important to recognise that a transition budget is substantial, and the existing revenue sources will not be adequate. Therefore, the government will need to plan just transition funding in the most efficient way. The most appropriate approach for this can be the convergence of schemes and

DMF and the scope of just transition

District Mineral Foundations (DMFs) have been established in all coal mining districts with the precise objective to work for the interest and benefit of mining-affected communities and areas. DMF today is a major source of revenue at the district level particularly in top mining states and districts of India where major mineral mining is happening. The share of coal in DMF funds has been by far the highest in top coal mining states such as Jharkhand, where it accounts for over 74% of the total accrual of ₹5,612 crore (US $ 779 million). In Ramgarh, the total DMF accrual until February 2020 was more than ₹656 crore (US $ 91 million), of which about 99% came from coal mining. The district further estimates an annual collection to the tune of ₹130 to 150 crore (US $18- US $20 million).

The DMF law stipulates that at least 60% of the DMF funds must be utilised for the improvement of status of certain 'high priority' issues that ails communities in most mining areas. These include drinking water supply, livelihood generation and skill development, healthcare, education, sanitation, welfare of women and children and environmental preservation. However, priorities should be determined periodically through bottom-up planning by engaging local Gram Sabha (village council) representatives and ward members (as applicable). Also, the Pradhan Mantri Khanij Khestra Kalyan Yojana (PMKKKY), the central government scheme aligned to DMFs, underscores that the funds should not only focus on short term gains, but should create long term security such as through investments for creating sustainable livelihood options.

Ramgarh so far has allocated over ₹900 crore (US $125 million) towards various development projects (considering estimated accruals in the next two to three years). More than 76% of this is for drinking water projects, including piped water supply and mini solar based water supply projects. In fact, piped water supply projects account for about 94% of the total drinking water allocations. Other sectors where DMF has been significant is for sanitation. Besides, the district has made some allocation for addressing issues of malnutrition through malnutrition treatment centers and *anganwadis*.

Going ahead, the DMF funds hold a lot of promise for the district in terms of improving livelihood opportunities (including agriculture, forest and horticulture based), education outcomes and creating an educated workforce, improving healthcare infrastructure and healthcare access particularly for people with low income, and creating social safety nets for future security. Even with the sliding mining activity, the district can be estimated to have an additional DMF accrual of nearly ₹1300-1500 crore (US $180 - US $208 million) in the next 10 years. Therefore, if used well, DMF funds constitute the perfect opportunity to start district-level planning for a just transition.

programmes to optimise the potential of funds.

As far as the private sector is concerned, suitable policies will have to be put in place to attract them to invest in Ramgarh. This could include the provision of land, lower taxes, better infrastructure, etc. However, it is essential to ensure that private investments work for the people and the environment and not only for profits.

Just transition in district's like Ramgarh is not something to be planned and executed in the future. It is here and now. It is important that the Centre and the state governments recognises this and develop a national framework to support districts like Ramgarh.

CHAPTER 5

A JUST TRANSITION FRAMEWORK FOR INDIA

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- Just transition in India is not just about providing alternatives to the formal coal workforce; instead, it is about a broad-based socio-economic transition of the coal mining areas.
- A well-managed transition will require support of all levels of government- Centre, state and district, to develop and implement policies and plans, and mobilise funds.
- Transitioning of the coal PSUs will be crucial to minimise job losses and government liabilities.
- Bottom-up planning and convergence of various programmes at the district level will be essential for a successful transition planning.
- This book is only the beginning; more in-depth work is required to capture the diversity in coal districts and develop the just transition framework further.

It always seems impossible until it's done.

—Nelson Mandela

5.1 FRAMEWORKS ON JUST TRANSITION

There is no universal, standardised framework for just transition, as it is widely accepted that the plans, strategies, and frameworks need to be site and context-specific. However, it is important to learn the key lessons from the experiences of coal transition initiatives and just transition programmes of various countries. For conceptualising a just transition framework for India, therefore, we have considered the global experiences and tailored it to suit the complexity of India's coal mining industry and regions.

In the last few years, many just transition frameworks have been put forth by government agencies, international labour unions, civil society organisations, climate change researchers, and multilateral institutions. We have reviewed the frameworks as proposed by the following agencies/ organisations to understand the commonality and differences among them:

- Canadian Just Transition Task Force;
- International Labour Organization;
- World Bank Group;
- International Institute for Sustainable Development; and,
- Climate Equity Network.

The above frameworks build on both local and global experiences and represent positions of different stakeholder groups. They, therefore, reflect a broad-based understanding of what a just transition framework should involve.

5.1.1 Canadian task force on just transition

In December 2018, the Task Force on Just Transition constituted by the Government of Canada presented their final reports, highlighting six pillars of just transition.[1] The pillars contain actions such as changes in the federal laws for just transition, pension programme, provisions for the engagement of local communities in the process, and funding support during the transition. The recommendations of the task force are summarised in table 1.

5.1.2 Guidelines for a just transition by ILO

In 2015, the International Labour Organization (ILO) published detailed guidelines outlining the role of government along with social partners for enabling a just transition.[2]

As per the guidelines, the government will have a primary role in creating a favourable, coherent, and stable policy environment, engaging in social dialogue with stakeholders during planning and implementation and establishing a sustainable funding source for implementation. Social partners, on the other hand, will have a primary role in community facilitation. This

Figure 1: Important aspects for a just transition framework, ILO

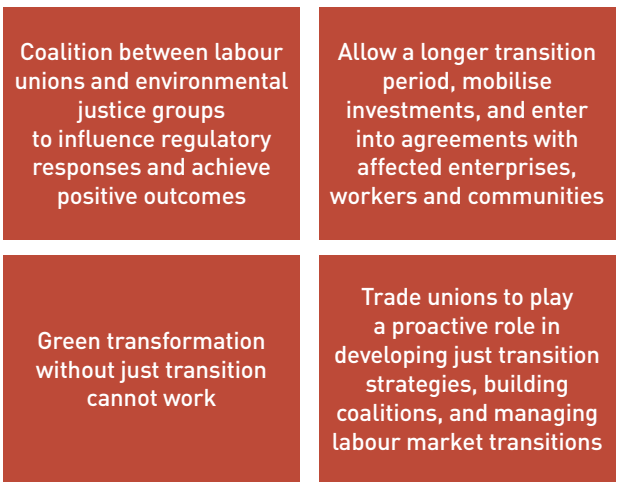


Table 1: Key recommendations of the Canadian task force on just transition	
Principles/pillars	Key elements
Embed just transition principles in policy and processes	• Include just transition provisions in federal environmental and labour laws. • Develop a plan for coal phase-out, which must be implemented through monitoring and public reporting. • Establish a fund to study coal phase-out impacts.
Establish local support systems	Establish locally operated transition centers for affected workers, and communities to provide relevant information and improve access to government services.
Provide workers a pathway to retirement	Create pension bridging programme to support early retirement.
Transition workers to sustainable employment	• Create a publicly available inventory of coal workers, including their skill profiles, demographics, locations, and current and potential employers. • Create a comprehensive funding programme for displaced workers. This will include income support, education and skills building, and mobility assistance.
Invest in community infrastructure	Invest in local infrastructure for offsetting employment losses from coal phase-out in the short-term and supporting economic growth over the medium to long-term.
Fund community planning, collaboration, diversification, and stabilisation	Establish a dedicated, comprehensive, inclusive, and flexible funding programme.

will include raising awareness and providing guidance, encouraging members to participate in social dialogue, and promoting inclusion of environmental provisions in the transition framework.

In 2018, drawing on case studies from the global North and the South, the ILO published another policy document highlighting some important aspects that should be kept in mind while developing a just transition framework. It emphasises the importance of a broad-based coalition and a comprehensive vision for just transition.[3]

5.1.3 Managing coal mine closure and achieving just transition by World Bank

The World Bank Group, in its issue paper in 2018, identified key elements for ensuring a fair transition, drawing on various mine closure practices.[4]

The Bank has put much emphasis on policies and well-framed strategies, including mine closure and land reclamation policies, well-coordinated governance and administrative mechanism, and policies for economic support and diversification, among others. The local context and engagement of communities in the transition process have also been emphasised. This includes developing a detailed understanding of the coal mining dependence of local communities and ascertaining their social and economic support preferences. (*see Table 2: Pillars for achieving a just transition: World Bank, p116*)

5.1.4 Just transition strategies by IISD

In 2018, the International Institute for Sustainable Development (IISD) published a report that identified "The-How-To" strategies for energy transition.[5] The report looked into energy transitions in Canada, Egypt, Indonesia, India, Poland, and Ukraine and identified opportunities for a transition away from fossil-fuel.[6] Effectively communicating the need for just transition is one of the key strategies advocated by this report (*see Figure 2: "The-How-To" strategies for energy transition: IISD, p116*).

5.1.5 Roadmap for just transition by Climate Equity Network

In 2019, a group of academicians published "*A roadmap to an equitable low carbon future: Four pillars for a just transition*" for the Climate Equity Network.[7] In the context of the prospective impacts of fossil-fuel transition in California,[8]

Table 2: Pillars for achieving a just transition, World Bank	
Pillars	Key elements
Policy and strategy development	• Developing comprehensive policy and planning measures to address coal mine closure. • Participation of multiple government agencies in policy development, as closure will require budgetary intervention of various agencies. • Setting up a specific mine closure agency for physical mine closure and land reclamation. • Setting up of an institution with the biggest stake in labour divestiture to coordinate stakeholder engagement, planning process, and maximise synergies between agencies. • Planning and managing budget outlays for just transition. • Facilitating genuine stakeholder dialogue for mine closure and economic recovery planning.
People and communities	• Identifying and mapping the social and economic dependence on coal mining. • Identifying the needs and preferences of different groups of workers. • Adopting a three-stage approach to large-scale labour divestiture – pre-layoff planning, pre-layoff assistance and post-layoff assistance. • Identifying potential impacts on women and adopting gendered design in transition programmes.
Land and environmental remediation	• Strengthening laws and institutions for mine closure planning and oversight of closure practices, as properly restored land can become a community asset. • Securing a guaranteed funding for mine closure by mandating financial assurance mechanism. • Bringing in mine closure companies for more efficient mine closures.

Figure 2: "The-How-To" strategies for energy transition, IISD

particularly from the view-point of 'environmental justice',[9] the roadmap suggested certain key policies, such as, short-term policies for replacement of wages and lost tax revenue, and long-term policies for the development of new businesses. Based on successful transition examples in some countries (such as Germany) and US domestic policy discussions, the roadmap provides guidance on necessary strategies for an equitable and fair transition.

There is a significant overlap in strategies put forth by different agencies and institutions. For example, federal-level laws and policies and the need for dedicated funding has been pointed out by all the above frameworks. Building a diverse coalition and local support systems has also been equally emphasised. However, there are also additional components that different institutions have identified based on their focus. The ILO, for example, has stressed the need to involve labour unions in developing the policies and plans, whereas IISD has pointed out the need for an effective communication strategy.

Overall, the strategies and pillars of just transition, as discussed above, are helpful guides to conceptualise a just transition framework for India's coal mining areas.

Table 3: Pillars and key elements of just transition, Climate Equity Network	
Pillars	Key elements
Government support	• Short-term policies for immediate support to communities and workers. • Long-term policies to restructure local economies and transform former fossil fuels sites.
Dedicated funding streams	• To address short-term needs, such as wage replacement and replacing lost tax revenue. • To address long-term needs such as development of new businesses, reskilling etc.
Strong diverse coalition	Diverse interest groups, including workers, local communities, environmental groups, businesses etc., need to work together on transition planning.
Economic diversification	Developing and fostering multiple industries, that are low-carbon, restorative, and suited to the region.

5.2 AN INDICATIVE JUST TRANSITION FRAMEWORK FOR INDIA

Just transition can be "good economics and good politics"[10] if a transition away from coal-economy is planned and managed well. This will help mitigate the impacts of climate change and ensure a growth trajectory that is sustainable and equitable and is far less vulnerable to social and economic disruptions. However, this will not be a simple task and will require a broad-base consensus, policy engagement, and planning architecture. In India, this is even more complicated, considering a wide diversity in coal-mining districts. For instance, some areas are 'mono-industry' coal towns like Dhanbad or Korba, whereas others have a more diverse economy, like Nagpur. Similarly, the mix of formal and informal coal economy makes just transition more complex than the western experience.

5.2.1 Just transition approach

Proposing a framework for just transition necessitates understanding what justice means in the context of India's coal mining areas. As history and local context suggest, the mining areas suffer from distributive injustice of resource benefits, economic stratification, and social exclusion. If justice must be ensured in the coal mining areas, all of these factors need to be accounted for.

Considering this, it can be argued that the most suitable approach for just transition in the Indian context will be a process of 'structural reform,' which can ensure both 'distributive' and 'procedural' justice for people in the coal mining areas. Distributive justice will entail planning a transition to ensure fair sharing of costs and benefits among various categories of people dependent on the coal economy and achieve equitable outcomes. Procedural justice mandates an inclusive decision-making process and recognition of collective ownership.[11] Such an approach will also help move away from the top-down processes and strengthen inclusive governance systems and bottom-up planning, rooted in the interest of the community. Within such a context of justice, we propose an 'indicative' just transition framework for India. The framework includes two components:

- Pillars and key elements of just transition; and,
- Policies and the role of various levels of government.

5.2.2 Pillars and key elements

A just transition framework can be built around the following eight pillars:

- Strong national and state government support;
- Diverse coalition and local engagement;
- Effective communication strategy;
- Local support system;
- Economic diversification and social security;
- Coal sector transition;
- Social and physical infrastructure development; and,
- Public and private investment for transition.

The key elements of each of the pillars are outlined in table 4.

Table 4: Pillars and key elements of just transition in India	
Pillars	Key elements
Strong national and state government support	• Develop regional, state and national plan for coal phase-out. • Establish a coherent policy architecture, where provisions of just transition are integrated in national plans and policies, and in policies and plans of the state and local governments. • Establish interministerial and multi-departmental coordination cell for just transition. • Facilitate social dialogue throughout the stages of just transition (pre-coal mining phase-out, during phase-out and post phase-out) to ensure transparent decision-making. • Set up a multi-stakeholder special body/agency for coal mine closure while entrusting it with the highest stake and responsibility to lead the process. • Provide financial and tax incentives to attract new low-carbon industries (that support local jobs) to secure diverse income and revenue sources.
Diverse coalition and local engagement	• Develop a strong and diverse coalition of various actors and stakeholders (including workers, community members, labour unions, environmentalists, businesses, local government) to work towards a shared vision of just transition through co-ordination and consensus. • Prepare a joint just transition proposal and engage with local communities.
Effective communication strategy	• Develop a communication strategy to reach out to all stakeholders, from national to local levels, to clearly convey the objective, need and timeframe for just transition. • Develop dedicated portal and information repository.
Local support systems	Open a just transition cell at local administrative levels to provide information, and engage with formal and informal workers to identify appropriate opportunities to substitute their incomes/ livelihoods, as per their skills, adaptive capacity and scope of mobility.
Economic diversification and social security	• Develop an economic diversification plan, taking into consideration local resources, manpower and connectivity. • Foster local entrepreneurship through investments in vocational training centres, educational programmes/facilities. • Invest in land and environmental restoration to create long-term economic and social assets.
Coal sector transition	• Enable restructuring of CIL and its subsidiaries, for diversification into solar, wind, energy storage, e-mobility etc., that is also aligned to the public purpose of energy security. • Create a special 'Workforce Transition Fund' to provide relief measures for displaced workers, such as temporary income support, mobility assistance, early retirement package, training and re-skilling assistance for younger workers etc.
Social and physical infrastructure development	Invest in infrastructure, such as for education, healthcare, clean water, energy, connectivity and urban amenities to improve social capital, and to attract businesses and investors.
Public and private investments	• Identify local, national and international funding sources and create a dedicated public fund. • Use public funds to attract private investments.

5.2.3 Policies and the role of various levels of government

Implementing the various pillars of just transition will require support from all levels of the government. Learning from the Ramgarh study, we identify the policies required to support just transition and outline the respective roles of the Centre, state, and district level governments.

5.2.3.1 Central government

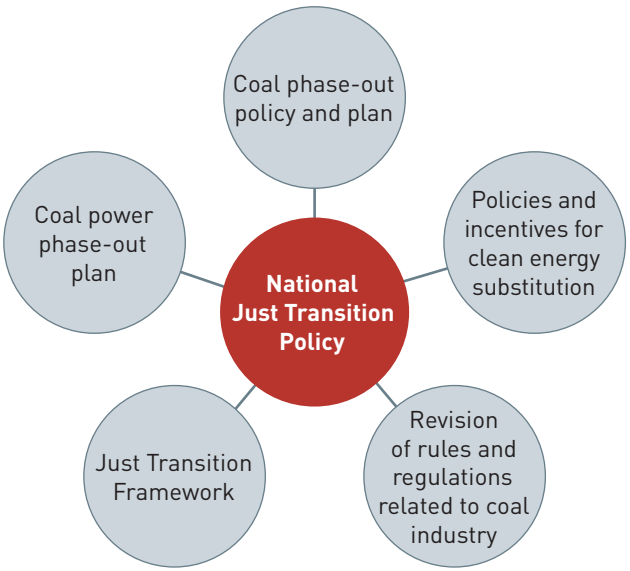
The central government has the most important role in developing supportive policies and programmes. There are mainly five areas in which the role of the Centre will be crucial. These include:

- Developing a national just transition policy;
- Convergence plan for national policies and programmes;
- Transitioning of coal PSUs;
- Financial package for just transition; and,
- Push for an international framework to support just transition in developing countries.

(a) National just transition policy

The Government of India will need to formulate a just transition policy as an integral part of India's clean energy transition and climate change mitigation strategy. The just transition policy should include the following key elements:

Figure 3: Elements of a national just transition policy



(i) Coal phase-out policy and plan: This will include scale, scope, and timing for capping coal production and setting a reasonable timeframe for just transition. This will also include regional, state, and national schedule for coal mine closure. As the timeframe for closing mines will vary from region to region, with some regions phasing-out earlier than others, the policy should provide clear mechanism for state-level consultation and indicators for deciding the coal mine closure schedule.

(ii) Coal power plant closure plan: To complement the coal phase-out plan, a plan to close coal-based power plants will also have to be implemented.

(iii) Policies and incentives for fostering clean energy substitution: These should be aligned with the timeframe of phasing out coal-based thermal power and simultaneous phasing out of coal mining activities.

(iv) Revision of rules and regulations related to coal industry, including laws related to workers, pensioners, mine closure, transfer of mine lease area, etc.

(v) A framework for just transition considering the pillars, as discussed in section 5.2.2.

(b) Convergence plan for national policies and programmes

There are important laws and flagship programmes of the central government, which can be augmented, converged, and suitably aligned with the just transition policy and its implementation. In fact, proper implementation of these laws and programmes through increased budgetary support and convergence can help to build a base for just transition immediately. The following are some of the important programmes and laws that are relevant in this regard.

National Mineral Policy and guidelines

Proper mine closure and associated land development practices are crucial for improving livelihood and income opportunities in the mining areas. In fact, the restored land can become an economic asset for communities once mining ceases to exist.[12] Towards this, the National Mineral Policy (2019) and guidelines of the Ministry of Coal provide direction.

The National Mineral Policy underscores that scientific mine closure will not only restore ecology and regenerate biodiversity, but will also enhance socio-economic outcomes. Recognising that where mining activities have been spread over a few decades, "closure of the mine means

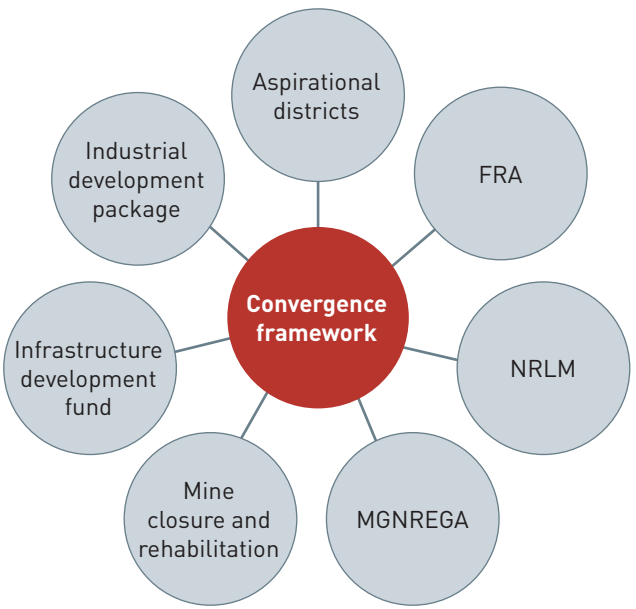
not only loss of jobs but also disruption of community life," it insists on the government's role in ensuring that the post-production reclamation of mining land becomes an integral part of the mine development process.[13] For this, consistent approaches must be adopted for efficient and effective mine reclamation and rehabilitation.[14]

The latest guidelines of the Ministry of Coal (2019) for preparing mining plans for coal and lignite mines also specifies restoring the land to its original condition (as far as possible) once mining activities are over, with progressive land reclamation and afforestation activities in the mined-out areas. To this effect, the surety for mine closure has also been revised. The surety for opencast mines is ₹9 lakh/hectare (US $ 12,000/hectare), and for underground mines is ₹1.5 lakh/hectare (US $ 2,000/hectare).[15] While this amount might not be sufficient, it certainly provides the seed fund to attract private investments in mine closure and land reclamation.

Mahatma Gandhi National Rural Employment Guarantee Act

Enacted in 2005, the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) is the biggest livelihood support programme for the poor and the unskilled workers in rural areas. The Act aims to strengthen the income base of the poor and focuses on natural resource management activities such as soil and water conservation, groundwater recharge, land restoration, drainage, irrigation, etc.[16] It also assures income security by ensuring wage employment of at least 100 days per household annually, whose adult members volunteer to do unskilled manual work.[17] MGNREGA can be used to build infrastructure and develop sectors such as agriculture, forestry, water resource management, etc.

Figure 4: Convergence framework for just transition



Forest Rights Act

The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act of 2006, also referred to as the Forest Rights Act (FRA), emphasises community-based governance of forests. One of the key opportunities for livelihood enhancement through FRA lies in the recognition of community forest resource (CFR) rights. The Act specifically provides for the recognition of forestlands as community forest resource areas and exercising community rights over them. This offers two crucial benefits. First, it gives forest-dwellers and forest-dependent communities the right to manage forest resources. Second, it enables them to secure livelihoods from such resources. The recognition of CFR rights, thus, has enormous potential for improving ecological and economic services that can be obtained from forest resources and contributing to the well-being of local communities, particularly marginalised groups.[18] As most coal mining districts also have large forest cover, FRA has enormous potential for enhancing livelihood opportunities.

Aspirational districts programme

The 'Transformation of Aspirational Districts' programme launched in 2018 aims to improve the human development indicators of various districts that are considered backward through a concerted, expeditious, and effective effort. The broad contours of the programme are convergence (of central and state government schemes), collaboration (between central and state-level '*Prabhari*' officers, and District Collectors), and competition (among districts to incentivise better performance). Towards its objective, the programme focuses on five sectors- health and nutrition, education, agriculture, water resources, financial inclusion and skill development, and basic infrastructure (including roads, access to potable water, electricity, and

sanitation facilities).[19] The programme operates through the convergence of various government schemes to achieve target outcomes. Many coal mining districts, including Ramgarh, come under the purview of this programme.

National Rural Livelihood Mission

The National Rural Livelihood Mission, now known as Deendayal Antayodaya Yojana (DAY), is targeted towards poverty alleviation in rural India. The scheme (launched in 2011) aims to increase household income through sustainable livelihood opportunities and improved access to financial services. With its focus on building strong community institutions, the scheme helps poor households to access skilled wage employment opportunities through women help groups (SHGs).[20]

In addition to the above, there are many other infrastructure and industrial development programmes that can be converged to build the base of just transition.

(c) Transitioning of coal PSUs

Transitioning of the coal sector PSUs will have to happen at two levels - first, the coal business itself will have to be restructured to allow proper and phased closure of mines, and second, these companies will have to transition from being a coal company to an energy company or a mining company.

Phased closure of coal mines should happen side-by-side with the just transition of the coal mining areas. Our analysis shows that this could make a win-win proposition for the

Mine closure and just transition can be a win-win proposition for CIL

CIL is closing mines, temporarily or permanently, due to various reasons without proper mine closure and plans for the mining areas' socio-economic transition. But that need not be the case. CIL can close its unprofitable mines, implement a just transition plan, and still make profits.

Operation of low yielding underground mines has been a drag on the balance sheet of CIL for over two decades now. In 2017, the company identified 65 loss-making mines for closure, out of which 62 were underground. These mines (65) employed about 40,000 workers at that time, which was about 13% of the company's total employee strength. As per sources, it gave little justification for the company to continue with those mines.[1]

This was not the first time when CIL considered closing these loss-making and low production mines. In 2010, the company had attempted to close down about 40 mines in the eastern region, which faced huge resistance from the trade unions, and the plan was shelved.[2]

The burden of underground mines continues to grow on the company and its subsidiaries, given its disproportionately high number compared to its production. As per the latest information, of the 352 mines the company is currently operating, nearly 45% are underground mines (158 mines). However, they account for only about 5% of the company's raw coal production.[3] These mines employ about 40-45% of CIL's total workforce and incur a loss of about ₹16,000 crore annually, about the same as the company's annual profits in 2018-19.

But there is a win-win proposition; CIL can close these unprofitable mines and use the extra profits (about ₹10,000-16,000 crores annually) to implement just transition in these mining areas. It can use this money for a good severance package for its employees, implement good mine closure, and invest in the socio-economic transition of these mining areas.

[1] Bose, P.R. (2017, June 01). CIL plans to shut down 65 loss-making mines. *The Hindu Business Line*. https://www.thehindubusinessline.com/companies/cil-plans-to-shut-down-65-lossmaking-mines/article9717877.ece
[2] Ibid
[3] Coal India Limited. (2020). *Annual report and accounts 2019-20*. Government of India Undertaking. https://www.coalindia.in/media/documents/Coal_India_English__final.pdf

companies as well as the workers and the community.

Transitioning of the business will be an important mechanism for diversification of the economy in the coal mining areas and absorbing a significant proportion of the coal mining workforce through re-training and re-skilling.

Coal India Limited (CIL), in fact, has been making announcements over the past two years for investing in renewable energy. In 2018, the company said it plans to set up 20,000 MW of solar projects in the next 10 years.[21] In August 2020, it was announced that CIL and NLC India Limited will jointly develop solar power assets of 3,000 MW with a likely investment of around ₹12,000 crore (US $1.6 billion).[22] The government has also been deliberating on leveraging CIL's mining expertise to foray into non-fuel minerals mining, including deep-seated and strategic minerals. If India is to build its renewable energy assets and infrastructure, the PSU's diversification in all of these sectors will be important.

(d) Financial package

Closing coal mines will have significant socio-economic impacts, including on local businesses and industries and reduced revenue for the state governments. These economic losses will have to be substituted through alternative measures. Ideally, a well-planned just transition should improve economic opportunities at the state and district levels and enhance revenue sources for the government. But to achieve this, policies to enhance social capital and diversify economic activities must be strengthened, and a financial package for infrastructure and industrial development should be provided. The financial package could include tax incentives, capital, and operational subsidies, infrastructure support, etc.

(e) An international framework to support just transition in developing countries

The world needs bold, transformative solutions that can bend the present trajectories of fossil fuel consumption, including coal, for addressing the escalating threats of climate change. To ensure that the developing countries reduce their coal consumption, a 'Global Support Programme' for just transition is needed to fund a fair transition, including energy transition investments.

The '*Solidarity and Just Transition Silesia*

Past experience of financial package by the Centre

The central government has extensive experience of using financial packages to develop industries and infrastructure in economically depressed areas. An example of such a package is the New Industrial Package for the North-East rolled out initially in 2007.

The Government of India introduced the comprehensive new industrial policy for the North Eastern Region to provide infrastructure support and project and production-related benefits for all industrial activities, including rural, small-scale, and agro-industries. The salient features of the policy include the following:

- Capital expenditure for the establishment of Industrial Growth Centre (IGC) and Integrated Industrial Development Centres (IIDCs).
- The IGCs and IIDCs were declared to be total tax-free zone for 10 years.
- Industries located in the growth centre were given capital investment subsidy at the rate of 15% of their investment in plant and machinery and an interest subsidy of 3% on the working capital loans for 10 years after the commencement of production.
- Transport subsidy of up to 90% on the transport cost for transportation of raw material and finished goods to and from the location of production.
- Development of village/rural and small industries.

A financial package on the lines of previous packages, with adjusted subsidies as per the geographical and economic context of the region, would be essential to develop non-coal industries in the coal districts and states.

Figure 5: Key components of the vision and action plan of Jharkhand Government

Source: Jharkhand Vision and Action Plan 2021, Government of Jharkhand

Declaration' has alluded to the need for support to developing countries for just transition. The declaration points out the need for "*Encouraging support for developing countries to promote low greenhouse gas emission and sustainable economic activities that will create quality jobs in regions, cities and non-urban areas.*"[23] While India was not a party to this declaration, it has a major stake in defining the global debate on just transition. India should, therefore, take leadership in facilitating the development of a 'Global Support Programme' for just transition.

5.2.3.2 State government

The state governments will be at the front line for dealing with just transition. They will have a vital role in the following aspects:

- Building a broad-based consensus and action plan to phase-out coal mining and power plants;
- Developing an economic and industrial policy that can help to steer away from coal dependence with respect to industrial development, employment, and government revenue;
- Developing a state-level policy for just transition, aligned with the national policy and state development vision; and,

- Facilitating and implementing the socio-economic transition using state and national policy instruments and financial resources.

A state-level just transition policy that is aligned to its vision and action plan can, in fact, be a starting point for facilitating a concerted approach on just transition for the coal mining areas.

For example, Jharkhand government's 'Vision and Action Plan' prioritises economic growth, social upliftment, and livelihood diversification through an output-outcome oriented approach.[24] The three-year action plan, applicable until 2020-21, had also identified certain outputs against various developmental goals. The vision and action plan of the state is also aligned to the state's Industrial and Investment Promotion Policy (2016) that outlines the blueprint for promoting manufacturing, developing infrastructure, fostering innovation, and creating employment opportunities across sectors for mitigation of poverty and unemployment in the state.

For just transition, state governments will have to develop a new vision and action plan, using a long-term output-outcome based planning process. This should be done with wider stakeholder consultation to avoid any major social or political disagreements in due course (*see Figure 5: Key components of the vision and action plan of Jharkhand Government,, p123*).

5.2.3.3 District administration and local institutions

A key criterion of just transition is local engagement and community dialogue.[25] An implementation plan needs to be developed at the local level through such engagement. The district administration and the local institutions have crucial roles to play in the following aspects:

- A participatory planning process; and,
- Implementation mechanism and financial provision.

(a) Planning process

India has constitutional provisions as well as extensive (unsuccessful) experience in local planning. The Constitution of India, through the 73rd and 74th Amendments (1992), provides a clear mandate for developing local level plans for economic development and social justice and provides an architecture for the development of such plans. Article 243G and Article 243W require the development of such plans by Panchayati Raj Institutions (PRI) and Urban Local Bodies. Further, Article 243ZD specifies the constitution of a District Planning Committee in every district, who shall be entrusted to consolidate the plans prepared by the panchayats and the municipalities in the district, and accordingly prepare a draft development plan for the district. A detailed guideline for developing district plans is also available.[26]

Over the years, a participatory planning process has been encouraged and mandated for programmes that are particularly targeted for alleviating poverty and addressing underdevelopment in rural and distressed areas. Some of the important exercises in this regard have been planning under the Backward Region Grant Fund (BRGF) programme in 2007, the Intensive Participatory Planning Exercise (IPPE) of MGNREGA schemes in 2014, Saansad Adarsh Gram Yojana (SAGY) in 2014, and the Gram Panchayat Development Plans (GPDP) exercise in 2015 under the Fourteenth Finance Commission grants.[27]

Multilateral institutions have also suggested identifying and mapping the social and economic dependence of workers and local communities on coal mining, as well as understanding their needs and preferences in planning for a just transition.[28] Just transition planning at the district level can build on these approaches.

(b) Implementation mechanism and financial provision

Implementation of just transition policies will require proper administrative mechanisms and fiscal provisions at the district-level.

A just transition task force can be created for this. The taskforce should be built on the existing administrative structure rather than creating a whole new parallel structure. The task force should have representatives from various government departments, coal industry, other industries, PRIs, and independent civil society experts.

Concerning funding, the economic package provided by the Centre and state governments will have to be converged at the district-level. Additionally, the District Mineral Foundation (DMF) funds can be of significance for initiating the process of livelihood diversification and improving social infrastructure early on. As discussed earlier, in major coal mining states and districts, the fund is

substantial. Through proper planning and administration, the fund has enormous potential to support just transition. In fact, the Pradhan Mantri Khanij Khestra Kalyan Yojana (PMKKKY) guidelines, which have been aligned to DMFs, specifies the need for creating an endowment fund from DMF budget to support sustainable livelihoods in the mining areas post-mine closure. The PMKKKY guidellines can be further amended to include just transition as an important component of DMF investments.

The framework for just transition, as outlined in this chapter, is indicative. It can be used as a base to develop a robust just transition framework for the country.

This book is only the beginning as it provides a reference point for facilitating a broader discussion on just transition framework and strategies. More in-depth work is required to capture the diversity in coal mining districts and develop various policies, strategies, and investment plans. The book, therefore, does not include a conclusion. It is a prelude to the next course of research and engagement.

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Part II

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iFOREST

International Forum for Environment, Sustainability & Technology (iFOREST), an independent non-profit environmental research organisation, was started by renowned scientists and environmentalists to innovate on policies and practices for tackling the pressing environmental and sustainability challenges of our times. As an institution, we strive to remain locally relevant and globally integrated. Our work on Just Transition is borne out of this mission and endeavour.

"I carry more than a quintal of coal on a bicycle and travel 40 to 50 km with it. It is the last thing I want to do, but what other livelihood option is there?"

—Cyclewallah (coal gatherer and seller), Bhurkunda mine, Patratu block

"We have been working in the Rajrappa coal washery for more than 20 years, but our jobs are still not permanent. We have nothing that gives us the identity of a company worker. If this work stops, no one will take care of us."

—Casual labourer, Rajrappa coal washery, Chitarpur block

"Coal mining directly contributes to the district's revenue in the form of DMF funds. If coal mines close, revenue substitution will not be the biggest challenge. But coal mining as an industry provides livelihoods to many, how they will be absorbed adequately must be considered."

—Sandeep Singh, District Commissioner, Ramgarh, Jharkhand

"There needs to be improvement in the way coal mines are being closed down. We have to make sure that local communities do not face the economic burden of coal mine closure."

—P M Prasad, Chairman-cum-Managing Director, Central Coalfields Limited

"Renewables and coal have to co-exist for some time before renewable can significantly contribute to a larger share of India's energy basket. At some point of time in future, this is bound to happen but till such time coal remains the dominant energy source in the country."

—Pramod Agrawal, Chairman, Coal India

"What has been discussed in this book, if it has meaning for one state in India, it is Jharkhand. If coal ends, then what happens? This book gives us the opportunity to understand what should be the policy with respect to the coal sector."

—Hemant Soren, Chief Minister, Jharkhand