# Mapping the Impact of Coal Mines and their Closure: A Case of Betul

Ruchi Gupta

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# MAPPING THE IMPACT OF COAL MINES AND THEIR CLOSURE

## A CASE OF BETUL

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*Creating Innovative Solutions for a Sustainable Future*

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# ABBREVIATIONS

| | |
|---|---|
| **AITUC** | All India Trade Union Congress |
| **BHEL** | Bharat Heavy Electricals Limited |
| **BMS** | Bharatiya Mazdoor Sangh |
| **BT** | Billion tonne |
| **CAGR** | Compound annual growth rate |
| **CIL** | Coal India Limited |
| **CITU** | Centre of Indian Trade Unions |
| **CLIP** | Contract Labour Information Portal |
| **CMPDI** | Central Mine Planning and Design Institute |
| **CMPF** | Coal Mines Provident Fund |
| **COVID-19** | Coronavirus Disease of 2019 |
| **CPSU** | Central public sector undertaking |
| **CSR** | Corporate social responsibility |
| **DGMS** | Directorate General of Mines Safety |
| **DIC** | District Industries Centre |
| **DMF** | District Mineral Fund |
| **EMS** | Earnings per manshift |
| **GCV** | Gross calorific value |
| **GDP** | Gross domestic product |
| **GST** | Goods and Services Tax |
| **GVA** | Gross value added |
| **HMS** | Hind Mazdoor Sabha |
| **HPC** | High powered committee |
| **INR** | Indian Rupee |
| **INTUC** | Indian National Trade Union Congress |
| **IRR** | Internal rate of return |
| **ITI** | Industrial Training Institute |
| **JBCCI** | Joint Bipartite Committee for the Coal Industry |
| **LMT** | Lakh metric tonne |
| **PM-KUSUM** | Pradhan Mantri Kisan Urja Suraksha evam Utthaan Mahabhiyan |
| **MGNREGA** | Mahatma Gandhi National Rural Employment Guarantee Act |
| **MP** | Madhya Pradesh |
| **MPGATSVA** | Madhya Pradesh Gramin Avsanrachna Tatha Sadak Vikas Adhiniyam (MP Rural and Road Development Act) |
| **MPMKVVCL** | Madhya Pradesh Madhya Kshetra Vidyut Vitaran Company Limited |
| **MPPGCL** | Madhya Pradesh Power Generating Company Limited |
| **MSME** | Micro Small and Medium Enterprises |
| **MSP** | Minimum support price |
| **MT** | Million tonne |
| **MTPA** | Million tonne per annum |
| **MW** | Megawatt |
| **NCDC** | National Coal Development Corporation |
| **NMET** | National Mineral Exploration Trust |
| **NRLM** | National Rural Livelihood Mission |
| **NSA** | Net sown area |

| | |
|---|---|
| **NTFP** | Non-timber forest products |
| **OBC** | Other Backward Classes |
| **OC** | Open cast |
| **PF** | Provident fund |
| **PH** | Phase |
| **PLF** | Plant load factor |
| **PME** | Premedical examination |
| **PSU** | Public sector undertaking |
| **RWS** | Regional workshop |
| **SC** | Scheduled Castes |
| **SECL** | South Eastern Coalfields Limited |
| **ST** | Scheduled Tribes |
| **STEM** | Science, technology, engineering, and mathematics |
| **STPS** | Satpura Thermal Power Station |
| **TERI** | The Energy and Resources Institute |
| **UG** | Underground |
| **UHV** | Useful heat value |
| **VRS** | Voluntary Retirement Scheme |
| **VTC** | Vocational training centre |
| **WCL** | Western Coalfields Limited |

# ABOUT THE **RESEARCH**

This research is a deep dive into Betul, a southern district of Madhya Pradesh where coal mining has a history of a hundred and fifty years. Four mines out of ten closed due to mineral exhaustion, in quick succession. The fourth mine closed in 2013; two more are slated to close by March 2021.

The research has attempted to stitch together various socio-politico-economic linkages that were established around coal, and consequences of its closure. The energy industry (coal mining and thermal power plant) became central to the district. Coal, that once offered prosperity, seemed eternal. That mines will close, was known; but even today there is little preparedness to deal with the change. The closures have had ripple effects on the place. Sarni, the coal town, witnessed de-population, trade and businesses either slowed or moved away. Jobs that were induced by the incomes generated from the energy industry and spent locally, dwindled.

If transition to a low carbon pathway is to take place and for it to be just, it is important to map each of those affected either by mining or by its decline, and their concerns and aspirations. Dialogue with them will be the starting point to any transition. Given the limited geographical coverage, Betul may be considered a local case study. But the results of the study are illustrative of the challenges faced by other mining districts in the country. Most of these challenges have been exacerbated now by the Covid-19 pandemic.

The research reached out to diverse groups of stakeholders to understand their experience of mining and its decline.



**District Administration**

District Magistrate, Superintendent of Police, District Forest Officer (North), District Mining Officer, District Planning Officer, District Industries Officer, Sub Divisional Magistrate (Shahpur), Tahsildar, Chief Municipal Officer (Sarni Nagar Palika)

**South East Central Railway**

Divisional Railway Manager (Nagpur)

**Energy Industry**

Pathakhera Coalfields: Area General Manager, Area Personnel Manager, Area Sales Manager, Area Finance Manager, Area Planning Officer, Chief Medical Officer, Senior Mine Manager

Satpura Thermal Power Station: Chief Engineer

**Workers**

Regular workers, contract workers

**Union**

Laal Jhanda Coal Mines Union (affiliated to CITU), All India Khadaan Mazdoor Sangh (affiliated to AITUC), Koyla Shramik Sabha (affiliated to HMS), Bhartiya Koyala Khadan Mazdoor Sangh (affiliated to BMS), Rashtriya Koyala Khadaan Mazdoor Sangh (affiliated to INTUC)

**Community**

People and their representatives from upstream and downstream villages of Shobhapur, Chattarpur (II), Pandhra, Sillaiya, Sukhadhana, Shaktigarh, Mordongri, Bakud, Belond

Convenor of Udyog Bachao Nagar Bachao Samiti

**Business**

Kalimai Vyaapari Sangh, Kalimai Truck Owners Association, Mining Contractors, Traders and shopkeepers in Pathakhera

# EXECUTIVE **SUMMARY**

Chapter one 'an overview of the energy industry', describes a brief history of Pathakhera mines from 1867 when coal from here was shipped to Bombay to fuel the steamships, to 1963 when these mines operated under National Coal Development Corporation and served as captive to the Satpura Thermal Power Station. In 1973 Western Coalfields Limited (WCL), a subsidiary of Coal India Limited took over the mine. This chapter maps the commissioning of various units of Satpura power plant and the corresponding opening of mines.

Pathakhera held a significant place as captive to the power plant, till it catered to all the units in Phase I. After these units were de commissioned, it catered to a single unit in Phase II. While the power plant meets its coal requirements for Phase II and III from mines under WCL, it procures coal from South Eastern Coalfield Limited for Phase IV.

Pathakhera was appreciated for its geographical proximity and supply of coal through road transport and conveyor belt. When newer mines opened in 1992–2003, Pathakhera recorded its peak production in 2006. Gradually with the decline in coal resource and the closure of four mines, the industry and the region slumped into a phase of decline.

WCL has approved the opening of two new mines at Pathakhera, predominantly to meet the coal demand of the power plant as well as to meet its 75 MT of production target by 2023–24. But the proposed mines await clearance from the Ministry of Environment, Forest and Climate Change. With two more mines (Shobhapur and Sarni) slated to close by March 2021, the coal transporters, traders and workers unions in the district's coal region have demand for new mines.

Chapter two, 'coal's interaction with Betul's economy', shows that the district's economy is intricately linked to its natural resource base. The primary sector constitutes 40% of the district's gross domestic product. The nature of coal's embeddedness in its economy is understood in the period following the mine closure, when there was a fall in the value added by mining in the district's gross domestic product and a simultaneous fall was recorded in all the components of the secondary sector, and that of 'trade, repair, hotels and restaurants' and 'financials' in the tertiary sector.

In the overall per capita income ranking of the State, Betul's ranking fell from 18 in 2011–12 to 36 in 2015–16. The impoverishment of the district is also reflected from the continuous decline in the share of its 'main' workforce, and an increasing share of the 'marginal' workers. The bulk of the 'main' workforce is agricultural labour followed by cultivators.

On analysing the average daily employment in the district, it is evident that the State followed by mining provide for the highest employment opportunity. Pathakhera Coalfield and Satpura Thermal Power Station were the only large industries in the district. The emergence of Sarni town makes it evident that coal has been the driving force in the district's development. Sarni is the only town to have come up after the district headquarters (also called Betul town) till today. In 1991 and in 2001, Sarni's population was higher than Betul town. As coal declined, Sarni also increasingly witnessed depopulation. Sarni's population fell from 95,000 in 2001 to 86,000 in 2011. Most of the retired employees and others chose to move out as they saw no future for themselves or for their children in the place. As a result businesses, trade and commerce declined in general in Sarni.

The energy industry emerged as a strong player in the region has been evident from the skewed distribution of infrastructure at the level of the tahsil (between

Betul tahsil[1] and Ghodadongri tahsil where the industry is located). The concentration is also seen at the level of households where resources are tilted in favour of the urban households in Ghodadongri.

Coal forms the fiscal base of the district's economy as royalty (on coal) alone accounts for 33% of the district's non-tax revenue. In addition to royalty, the district also benefits from receipts under the District Mineral Fund, MPGATSAVA[2], Transit fee levied on coal. The Sarni nagar palika (municipal body) carved to serve the industrial wards and those around it, receive 74% of their revenue from the coalfield and power plant.

Chapter three provides an 'overview of employment in the energy industry'. It describes the change in the recruitment practice over the years in the coalfield and its implications. Earlier there were mass recruitment drives and the region saw an influx of workers to take up job as miners. There were no criteria for educational qualification and anyone who cleared a physical endurance test, was selected. The last such drive was in 1984.



However, new recruitments are restricted to statutory positions and to compensatory positions (employment given to next of kin in case of death of employee while in service, or in case of disability of the employee; to those who lose land under the 'project affected persons'). The region now sees massive retirements every year, both in the coalfield and in the power plant. By 2030, 46% of the coalfield's workforce strength of 2019 is expected to retire.

For any discussion on transition, it is important to understand the workforce composition of the industry- the nature of jobs (whether formal or informal), their social and educational status and their ability to respond to change. The bulk of the workers in both coalfield and power plant are non-executives. Particularly in the coalfield, 93% of its workers are engaged in Group C&D. The social composition of the workforce was also to an extent influenced by caste. A large section of the workers have limited upward mobility in employment and carry the burden of being socially disadvantaged. Sarni, now forms a part of the Scheduled Castes reserved assembly constituency in the district.

The decline in regular workforce is compensated by a new force of informal, contract workers. The region foresees an increase in informal workers so long as the industry continues, and retirements take place. Contracting is not a new phenomenon, but its implications need to be understood. While it addresses the revenue and production target of the industry and brings down the cost; it also brings with it practices that increase inequality and marginalization of the growing number of contract workers. Though the industry insists on fair treatment of contract workers, the compliances rests with the contractor.

The disparity in entitlements and working conditions between the regular and the informal workforce translates to extreme socio-economic inequality in the region. The informal worker gets trapped in a cycle of poverty and this race to the bottom will damage the labour market of the future.

Lately, employment in the industry for the locals have been largely limited to compensatory employment (under project affected persons) or in the informal and temporary jobs. Coal mines are in rural areas where agriculture continues to be the mainstay. With decline in agricultural returns and for lack of better alternatives, the youth take up informal job in the mines or else is left with the option to migrate out. This research does not support opening of new mines or promoting employment in mines. All it has done is to attract the attention of stakeholders to the growing informal workforce in the coal mines.

Chapter four on 'agrarian landscape: understanding the economy beyond coal', looks at some of the key factors in the growing share of agricultural labour. The rural community of farmers and farmer turned miners have been experiencing marginalization. The declining share of large and medium farmers and an increasing share of small and marginal farmers in the region explain largely the growing numbers

1 Each state in India is divided into districts. Each district is further divided into sub-districts kn own differently in different parts in the country (e.g., tahsil, taluka, community development [CD] block, mandal, etc.).

2 Madhya Pradesh Gramin Avsanrachna Tatha Sadak Vikas Adhiniyam (MP Rural and Road Development Act)

seeking work as casual labour in the mines or as agricultural labour. In the district, rural Ghodadongri (where energy industry is located) has the highest percentage of households engaged in manual casual labour (60%) and the least percentage of households in agriculture (28%) across the district.

Shift from food crops to cash crops (e.g. the traditional millets kodo kutki, now replaced by sugarcane and soyabean) has had a direct bearing on the water table in the region. Exacerbated by mining, there is now limited water availability. The district and the industry (through its corporate social responsibility) have been faced with the demand of meeting the needs of irrigation infrastructure of the place.

This section also takes through the impact of the energy industry on the agricultural productivity and practices in the villages in its vicinity. While the villages benefitted from the infrastructure built by the industry, particularly roads, the township provided a ready market for their produce. The upstream community however suffered from fly ash and coal dust that destroyed the produce and the productivity, depleted ground water aquifers, polluted streams, cracks and subsidence on landscapes. Increased competition for water and land, eventually driving the rural agrarian community (who also are the indigenous Gonds), to the margins.

The research has tried to bring out the ramifications of mining and its closure. Besides the environmental and health impact of mining, it severely impacted the lives and livelihood of the indigenous community. Closure of mines brought about a complex situation. De-population of Sarni, its inability to prepare a Master Plan, rise in police interventions (reported crimes), increasing cases of mental health and stress reported amongst employees in the area hospital of the coalfield, formation of forums such as *'udyog bachao nagar bachao'* demanding opening of new mines and setting new units of power plant, are some of the challenges that the region now faces. Moving away from coal does not find a place in the political manifesto of any political party in the region, nor any mention in the local media.

The way forward suggests tailor made approach for the district that focusses on rural incomes and enhancing opportunities that reduces vulnerabilities. The identified local priorities emphasised on strengthening agriculture and on education and skill building. The study suggests convergence of efforts of the state and the public sector undertaking; and Mapping the impact of coal mines and their closure 10 mobilising financial resources, (particularly receipts from coal realised under the DMF, MPGATSVA, CSR and transit fee) to additionally fund works for the affected communities.

# 1 An Overview of the Energy Industry

## 1.1 Locating Pathakhera Coalfield in Betul

The Pathakhera Coalfield comes under the Western Coalfields Limited (WCL), a subsidiary of Coal India Limited (CIL). The WCL is headquartered in Nagpur, Maharashtra, and has three operational areas in Madhya Pradesh (MP)-Pathakhera-Kanhan-Pench. The entire area spreads across the Betul and Chhindwara districts of MP. Pathakhera forms the western-most part of this belt and lies in the Betul district. This coalfield holds a premier position in India for having a considerable share of reserves of thermal grades of non-coking coal.[1] Pathakhera lies in the Satpura Melghat forest, a rich forestland and wildlife corridor. Mines in the region are underground (depending on the depth of feasible coal seams).

### *1.1.1 Brief History*

The centrality that coal occupies in the Pathakhera region can be traced to 1867 when seams of good quality coal of 3 m thickness were explored and coal reserves were estimated at 150 lakh tonnes. The first mine in the region was leased to an Englishman in 1934 and coal was sent to Bombay to fuel the steamships. However, after a period of time, mining was discontinued as seams of sandstone were struck, giving the region its name 'Pathakhera'.[2]

In 1963, the mines were re-opened by the National Coal Development Corporation (NCDC) to serve as captive to the Satpura Thermal Power Plant. After the Coal Mines Nationalisation Act of 1973, Pathakhera was brought under the Western Coalfields Limited (WCL), a subsidiary of Coal India Limited (CIL).

Pathakhera mines developed as captive to the pithead Satpura Thermal Power Station (STPS) of MP Power Generating Company Limited (MPPGCL) at Sarni,[3] is at a distance of 5 km. The STPS was the biggest power project in the state when completed in 1967, with financial aid from US Agency for International Development.

In 1967, five units (Unit I to Unit V) of 62.5 MW each were commissioned at the STPS. The period 1969–1975 saw continuous opening of five mines to meet the requirement of coal-fired electricity generation. These mines are Pathakhera I (opened in 1969), Pathakhera II (1971), Satpura I (1972), Satpura II (1973) and Shobhapur (1975).

From a capacity of 312.5 MW in 1967 (five units of 62.5 MW each) based on imported electrical equipment from USA, the power plant enhanced its capacity subsequently to 1142.5 MW with indigenously made turbo generator set and boilers by Bharat Heavy Electricals Limited (BHEL). Between 1979 and 1984, four additional units (Unit 6,7,8 and 9) at STPS were commissioned, which increased the capacity by 830 MW (200+210*3 units). This also co incides with the period when the country experienced oil shocks ( of 1973–74, 1978–79, 1980–81) and the Fuel Policy Committee identified coal as the primary source of commercial energy.[4]

1 Source: CMPDI. 2015. Report on land use/vegetation cover mapping of Pench-Kanhan-Tawa Valley Coalfield based on satellite data for the year 2014, Ranchi

2 WCL Documentary on Pathakhera

3 CMPDIL, Environment Department. 2011. Executive Summary for Environmental Impact Assessment and Environmental Management Plan for Public Hearing as per EIA Notification, 2006, TAWA, Pathakhera Area, WCL

4 History of Coal India Limited: Factors which led to the Nationalisation of Coal Industry in India. Details available at https://www.coalindia.in/en-us/company/history.aspx

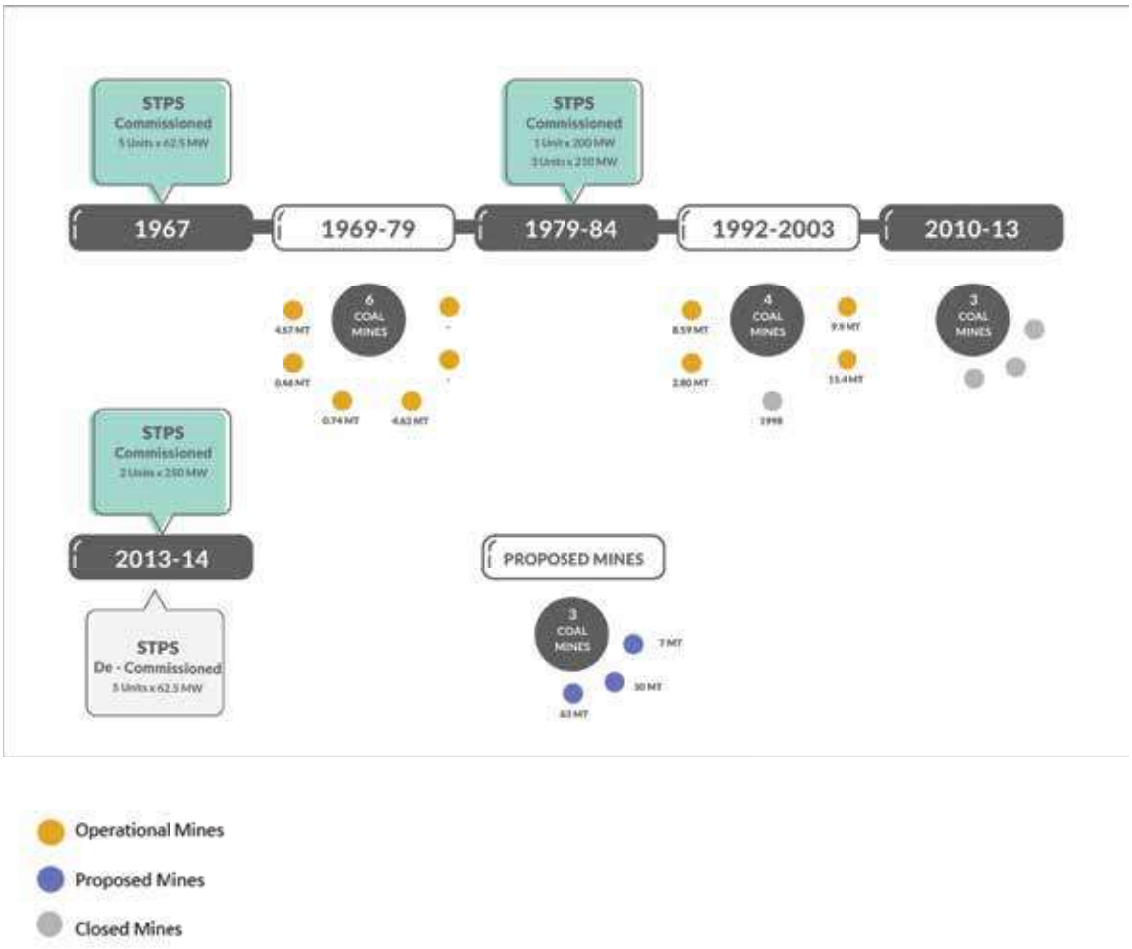



**Figure 1: Chronology of the power plant and mine development**

*Note: Figures outside the mine indicate reserves in the mines as of 2010*



Sarni mines were opened in 1979 and because of the continuous growing demand for coal in the power plant, four more mines began operations, namely, Tawa I (1992), Chatarpur I (1992), Chatarpur II (1992), and Tawa II (2003).

While the first five units of 62.5 MW were decommissioned (had completed their service life and were subsequently dismantled), between 2012 and 2014, two new units–Unit 10 and Unit 11, of 250 MW each, were commissioned in the same period. A pictorial depiction of the details is given in Figure 1. Currently, the total installed generating capacity at STPS is 1330 MW, comprising 1x200 MW, 2x210 MW, and 2x250 MW.

The power evacuation infrastructure for the STPS comprises the following high-voltage AC transmission lines:[5]

| | |
|---|---|
| Power evacuation 400 kv lines | STP: Itarsi/Indore<br>STP: Koradi/Bhilai |
| 220 kv lines | STP: Itarsi (4)<br>STP: Kalmeshwar (1) |

## 1.2 Demand for Coal by Satpura Thermal Power Station

Coal requirements for STPS till recently were met entirely by WCL. Till 2014, the annual allocation of

5 Madhya Pradesh Power Generating Company Limited. Details available at http://www.mppgcl.mp.gov.in/stps-sarni.html

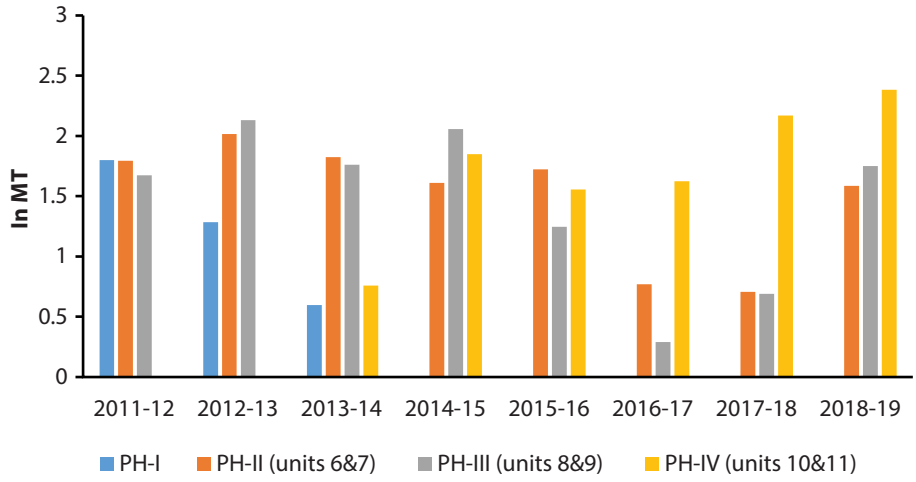



**Figure 2: Phase-wise coal consumption at STPS**

**Source:** Office of the Chief Engineer, STPS

coal from WCL was 6.6 MT for the older units (PH-I, PH-II, PH-III) and 1.9 MT for the new units in PH-IV.

Pathakhera held a significant place as captive to STPS till it catered to all five units of PH-I. According to officials of STPS, since the decommissioning of five units, Pathakhera's coal is now used for Unit 6 of PH-II. For units 7,8 and 9, coal supply is met from WCL's Pench Kanhan, Ballarpur, Wani, Mauri, and Nagpur fields. South Eastern Coalfields Limited (SECL) meets the coal requirement of PH-IV.

Coal consumption by STPS reached its nadir during 2016–17. During this time, all the units at STPS were kept in reserve shutdown. Low demand and power purchase agreement with private producers forced the state government to pay the private players even when the purchased power was not in use. This caused the state-owned thermal units to be kept in reserve shutdown.[6]

Figure 3 summarises the coal quantity purchased and consumed by STPS.

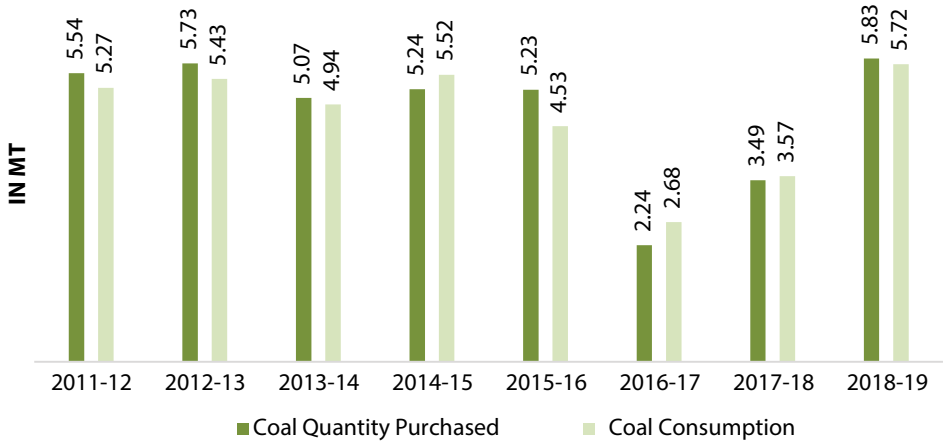



**Figure 3: Coal demand of STPS**

*Source: Office of the Chief Engineer, STPS, Sarni*

6 Details available at https://timesofindia.indiatimes.com/city/bhopal/mp-power-generation-by-state-owned-units-just-40-of-capacity/articleshow/57819318.cms

Officials point that the decision to close the four units 6, 7, 8 and 9 by 2021–22, is in the pipeline and that a non-pit head, super critical plant of 660 MW, by 2026–27 is underway. The STPS had once witnessed a period when each unit of 62.5 MW consumed 5 lakh tonne of coal. Today, technological changes and automation have improved energy efficiency. Now, a single new unit can replace the older ones and stricter emissions reduction norms affect the demand for coal too.

## 1.3 Coal Production and Supply from Pathakhera

### *1.3.1 Supply to STPS*

Pathakhera is the only coalfield that supplies coal through conveyor belt and road transport. The geographical distance plays an important role in determining the price of coal and the reliability of its delivery. WCL coal mines have the advantage of close proximity to STPS as the distances range from 8 km to 458 km, whereas the SECL supply sources are situated between 735 km and 906 km.

Figure 4 shows the trend in coal production in the region. The demand of coal for electricity generation at STPS spiked the production at Pathakhera. The period (1986–87) in which three units of 200 MW and 210 MW were commissioned, also witnessed a fourfold increase in coal production. Pathakhera was appreciated for its coal supply owing to its geographical proximity that considerably reduced transportation costs. Newer mines opened in 1992–2003 and the region recorded its peak production at 3.3 MT. Gradually with the closure of four mines, the industry and the region slumped into a phase of decline.

In 2016–17, the nadir in the region reached when the power plant was put under reserve shutdown and 2.24 MT of coal was procured, consequently Pathakhera's coal supply dropped to 1.4 MT (Figure 5). The annual coal output since this period has been on decline and in 2018–19 reached the lowest in the last three decades (Figure 5).

The supply of Pathakhera coal through conveyor belt and road transport was by far the greatest advantage to STPS. According to officials, road transport ensures timely and an assured supply of coal. Besides the limitation of service reliability, unless there is a demand of 4000 tonne, i.e. demand for a rail rake, the order may run a chance of getting diverted to other plants. Due to the close locational proximity there was negligible additional landed cost of coal.

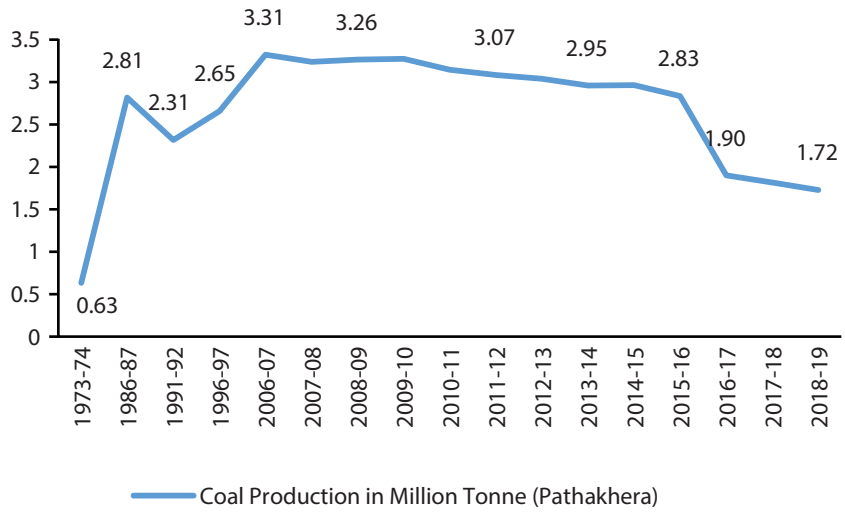



**Figure 4: Coal production from 1973–2019, Pathakhera Coalfield**

*Source: An Overview, 2014–2015, Western Coalfields Limited*

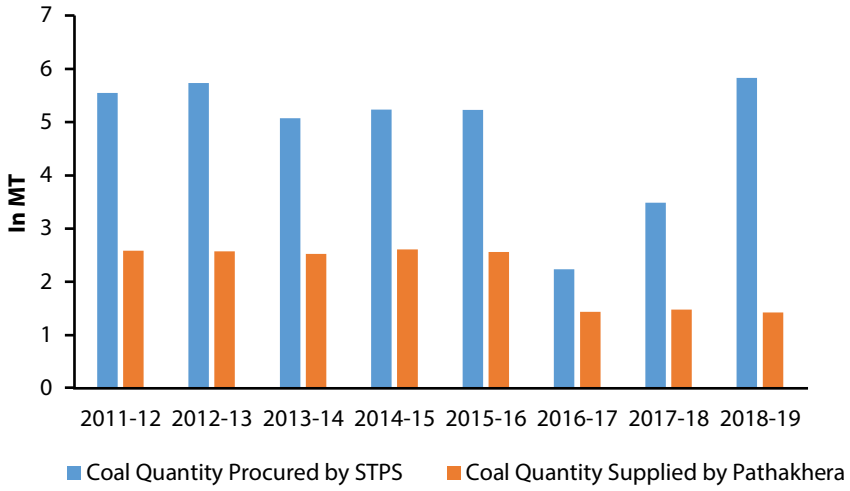



**Figure 5: Coal supply for STPS from Pathakera Coalfield**

*Source: Office of Chief Engineer, STPS, Sarni*

(MPPGCL has its railway siding and a dedicated railway line from Ghodadongri to Sarni for the transportation of coal and other associated infrastructure required for operation of the existing power plant. Railway siding was set up between 1992 and 1995 under the supervision of the Indian Railways. Currently, work of augmenting railway siding at the Ghodadongri and Sarni Yard (at the plant yard of 2 ×250MW) is being undertaken.[7])

Sarni and Shobhapur mines at Pathakhera are directly connected to the power plant by conveyor belt. As reserves in these two mines are near exhaustion and operations will close by March 2021, the supply through conveyor belt will be put to a halt. As evident in Figure 6, the share of transport through conveyor belt began decreasing from 2011–12.

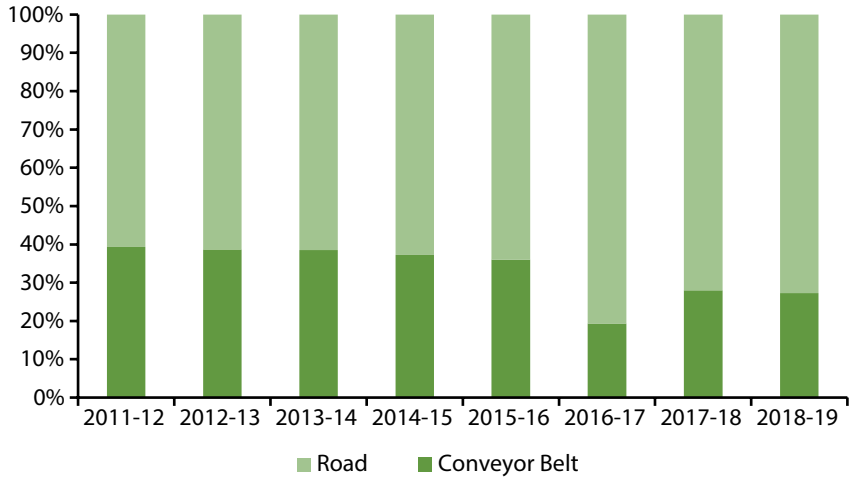



**Figure 6: Transport mode for coal supply to STPS from Pathakhera Coalfield**

*Source: Office of the Area General Manager, Pathakhera Coalfield*

7 Details available at http://www.mppgcl.mp.gov.in/Growth%20Plans/STPS-STAGE-123.pdf

### *1.3.2 Supply to Non-core Sectors*

Besides the supply to the power plant, coal from Pathakhera also finds its market through e-auction (Figure 7). Under the New Coal Distribution Policy of 2007, 10% of CIL's estimated annual production can be offered under e-auction, though this quantity is revised from time to time.[8]

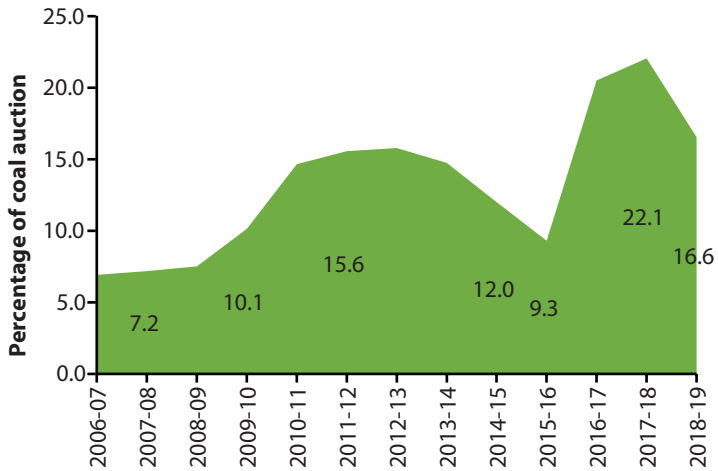



**Figure 7: Percentage of coal auction to total production, Pathakhera Coalfield**

*Source: Office of the Area General Manager, Pathakhera Coalfield*

E-auction helps higher realization as compared to the coal sold to the power plant at a pre-determined price. Coal from e-auction is in demand from various segments of buyers who do not have a steady supply contract of coal with CIL.

Road transportation of coal through trucks to the power plant (command 75% of the total transport share) and to the buyers under e-auction, has come to occupy a central position in the economy of the region.

## 1.4 Mine Closure and Proposal for New Mines

### *1.4.1 WCL's justification for New Mines in Pathakhera*

The years between 2010 and 2013 saw a continual closure of mines–Pathakhera I (closed in 2010), Pathakhera II (2011), and Satpura II (2013). Satpura I mine had already closed in 1998. The reserves from these mines either depleted or the remaining was not feasible to extract. Pathakhera II and Satpura II mines were closed with intact reserves of 0.46 MT and 0.74 MT, respectively. By March 2021, a fifth mine, 'Shobhapur', is slated to close too.

The proposal to open up new mines has been pushed forth predominantly for meeting the coal demand of the Satpura Thermal Power Station (STPS) and to re-deploy the workforce of the closed mines.[9] The annual requirement of coal for STPS is 7.10 MT out of which 2.5 MT is met by Pathakhera. The remaining requirement is met from neighbouring Pench-Kanhan and distant coalfields of Kamptee, Wardha under WCL, and South Eastern Coalfields Limited (SECL).

Moreover, the justification for new mines has also been looked at from the point of meeting the production target of the larger subsidiary, i.e. WCL. CIL targets reaching 1 billion tonne of coal in financial year 2023–24 with WCL's share of 75 MT.[10]

8 Ministry of Coal, Government of India. 2007. New Coal Distribution Policy. Details available at http://www.westerncoal.in/sites/default/files/userfiles/policy181007.pdf

9 CMPDI. 2010. Project report for Tawa III UG mines. Details available at http://forestsclearance.nic.in/writereaddata/FormA/Miningletter/1111101261221B9CZ8Tawa3PR.pdf

10 Details accessed from https://pib.gov.in/PressReleasePage.aspx?PRID=1629862

**Table 1: WCL's projection for coal production**

| Year | Coal (MT) |
|---|---|
| 2021–22 | 65 |
| 2022–23 | 70 |
| 2023–24 | 75 |

*Source: Western Coalfields Limited, Annual Report & Accounts 2019–20*

To meet the planned target of production by WCL as a whole as shown in Table 1, and in particular to increase the coal supply to STPS from Pathakhera, which is presently 33.3%; it became incumbent upon WCL to identify new mines.

Pathakhera now faces threats of sorts in the coal market as not only the despatch to the power plant has declined with STPS fulfilling its requirement for its energy-efficient units from other coalfields in WCL and SECL, but the reserves in its existing mines have also declined. Moreover, it is unable to meet the rising cost of production even with the supply in auction at market prices (the maximum is only 20% of the output) as there is a strong imperative to sell maximum to the power plant at a rate that ensures cheap electricity.

A TERI analysis for this coalfield over a six-year period (2012–18) of the CAGR (compound annual growth rate) of its cost of production and the price of coal, suggests that the CAGR of the cost of production is 14% against the CAGR of the price of coal (price to the power plant) at 6%. This significant difference in CAGR indicates the reduction in profitability of the coalfield over the years.

Three new mines namely, Tawa III, Gandhigram, and Shaktigarh have been proposed for opening in Pathakhera (Table 2). Though WCL has not approved Shaktigarh mines as it is not expected to yield the desired 12% IRR[11] (Internal Rate of Return) and hence

**Table 2: Production details of the proposed new mines**

| ` | Extractable reserves assessed (MT) | Target capacity of the mines (MTPA) | Life of the mine (in years) |
|---|---|---|---|
| Tawa III (Grade D coal, UHV of 4390 k.Cal/kg and GCV of 5400 k.Cal/kg) | 6.8 | 0.48 (normative) to 0.60 (peak) | Construction period of 3 years<br>Production period of 16 years (also the revenue life of mine) |
| Gandhigram (Grade D coal) | 30.67 | 1.2 (normative) to 1.6 (peak) | Construction period of 3 years<br>Production period of 28 years |
| Status of clearance for Tawa III and Gandhigram: Subsidiary-level clearance obtained. Forest Clearance under the Forest Conservation Act, 2000 (as it lies in the Asir Reserve Forest) and Environmental Clearance is pending | | | |

*Source: CMPDI, Project reports for TAWA-III UG mine and Gandhigram UG*

11 CMPDI. 2016. Recast project report for Gandhigram U/G mine available at http://environmentclearance.nic.in/writereaddata/Online/TOR/01_Apr_2017_124644550JUZXPoQFExecutiveSummary.pdf

economically unviable, the Tawa III[12] and Gandhigram mines have been approved by it.

During the period of this study, as on December 2019, the proposed TAWA III and Gandhigram mines were yet to receive forest and environmental clearances, but they have raised sufficient aspirations and concerns in the region.

### *1.4.2 People's Demand for New Mines in Pathakhera*

Demand for newer mines have come from various quarters in the district. The average distance that coal moves through the trucks from the region has increased. The coal transporters and traders have come to occupy a central position in the district's coal region and have a powerful voice.

Besides (further chapters have dwelt deeper into the state of employment in the district) a thousand five hundred direct jobs have been estimated in Gandhigram and Tawa-III mines together. People's employment aspirations are fuelled by the high prospects of direct and indirect opportunities generated in these mines.

During the pandemic-induced lockdown, the power plant operated at its minimum load. TERI's analysis show the average PLF of the plant in April-December 2020 was 36.5% as against its previous average of 40.1% (April–December 2019) and 62% (April–December 2018). Consequently the coalfield experienced a decline in its production. Trade and transport of coal was badly affected as the industries were under shut down. This period also coincided with the seasonal firing period of brick kilns (which depend on coal for firing), giving a huge blow to trade and transport.



12 CMPDI. 2018. Recast project report for Tawa-III U/G mine available at available at http://environmentclearance.nic.in/writereaddata/Online/TOR/05_Nov_2018_12470590oDJKTHUYUAnnexure-PFR-TAWA-IIIUG.pdf

# 2 Coal's Interaction with Betul's Economy

## 2.1 An Overview of the District's Economy

The 2011 Census recorded the population of Betul at 1,575,362 with 80% of its share being predominantly rural; with a Scheduled Tribes composition of 42% and Scheduled Castes composition of 10%. In 2011, 39.8% of the district's total geographical area was under forest.

That the district's economy is intricately linked with its natural resource base is evident from Figure 8. Primary sector (consisting of agriculture, forestry, and mining) constitutes 40% of Betul's economy.

## 2.2 Coal's Role

Mining forms a part of the primary sector in the district's GDP. The gross value added (GVA) by mining in the district is 3.6% in 2011–12 and 2.2% in 2016–17. Between 2010 and 2013, three mines closed down successively. Such is the magnitude of influence it holds on the secondary and tertiary sectors of the district, that a fall in the value added by mining showed a simultaneous fall in the secondary sector (manufacturing, electricity and construction) as well as in tertiary sector (in the 'trade, repair, hotels and restaurants' and the 'financial' components) (Figures 9, 10 and 11). That decline in other sectors may not be due to mining alone, but mining and activities around it, is a significant cause. The subsequent sections have shown, how mining has shaped the district's economy.

Corresponding to the mine closures, the per capita income ranking of Betul in the State fell steeply from 17th rank (out of 46 districts) in 2005 to the 36th (out of 51 districts) in 2015–16 (Figure 12).

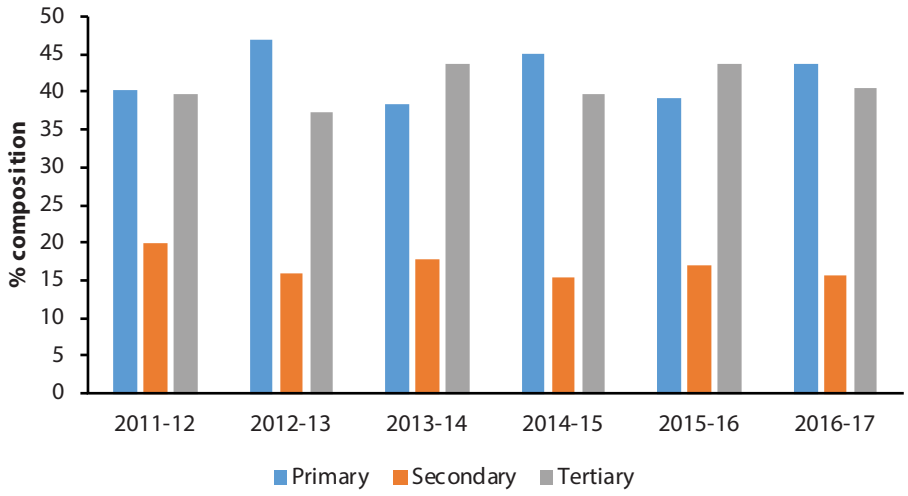



**Figure 8: Sectoral composition of Betul's economy**

*Source: Estimates of District Domestic Product from 2011–12 - 2016–2017, Directorate of Economics & Statistics, Madhya Pradesh (accessed from des.mp.gov.in)*

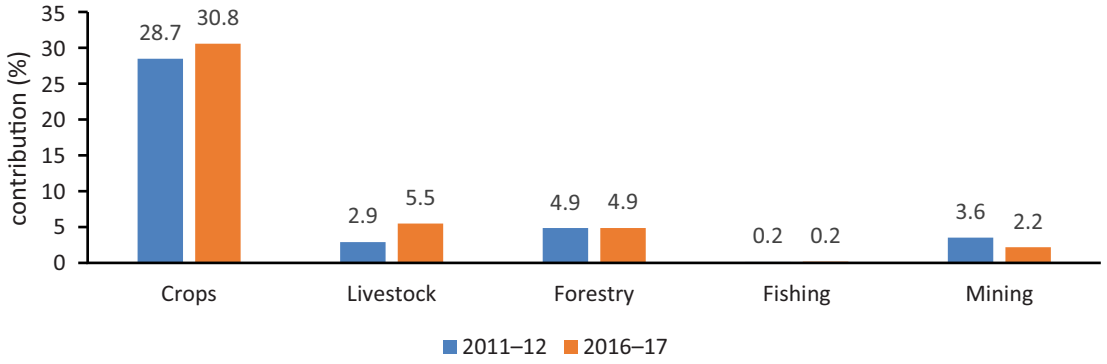



**Figure 9: Gross value added at constant (11–12) prices by primary sector**

*Source: Estimates of District Domestic Product from 2011–12 - 2016–17, Directorate of Economics & Statistics, Madhya Pradesh (accessed from des.mp.gov.in)*

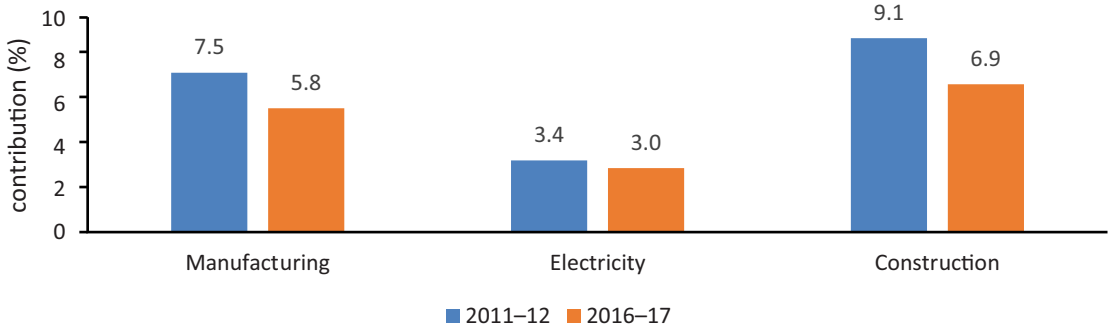



**Figure 10: Gross value added at constant (11–12) prices by secondary sector**

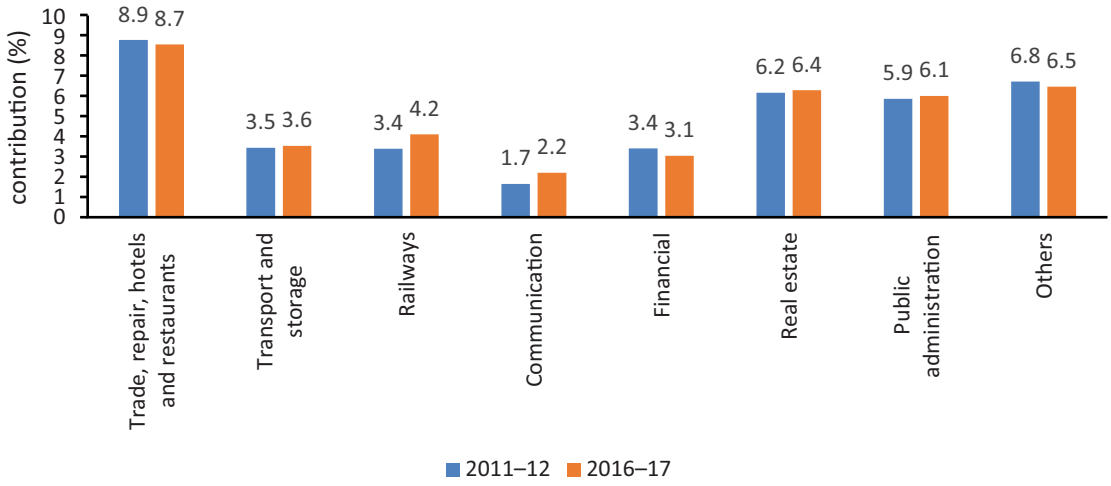



**Figure 11: Gross value added at constant (11–12) prices by tertiary sector**

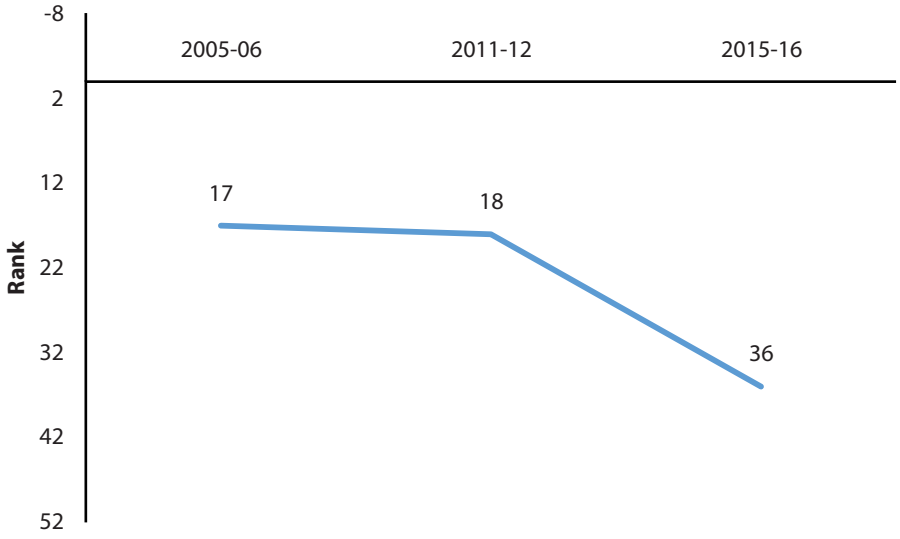



**Figure 12: Betul's rank in the overall district on per capita income**

*Source: Estimates of District Domestic Product 2011–12 - 2016–17, Directorate of Economics & Statistics, Madhya Pradesh accessed from des.mp.gov.in*

## 2.3 Employment Scenario in the District

### *2.3.1 Workforce Composition*

According to the District Planning Office, the work participation rate[1] in the district was 50% in 2011.

Figure 13 shows the main and marginal workforce composition[2] of the district and of the state over last three Census', i.e., 1991, 2001 and 2011. Like the state, the district too follows a declining trend in the percentage share of main workers and on the contrary an increase in the percentage of marginal workers.

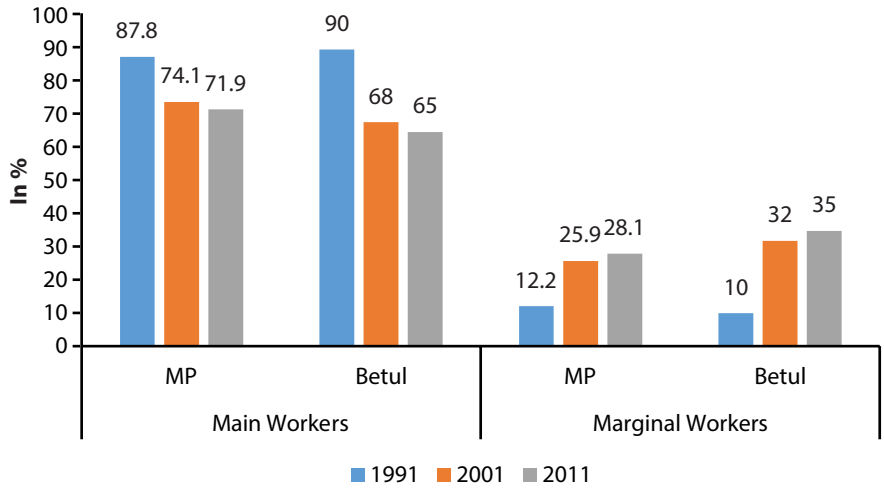



**Figure 13: Changing workforce composition**

*Source: Analytical Report on Primary Census Abstract, Directorate of Census Operations, Madhya Pradesh (accessed from censusmp.nic.in)*

1 Work participation rate is the percentage of workers (main + marginal) to the total population

2 Main worker is a person who has worked for major part of the reference period (six months or more during the last one year preceding the date of enumeration) in any economically productive activity. A marginal worker is one who has worked for three months or less but less than six months of the reference period (the last one year preceding the date of enumeration) in any economically productive activity.

The increasing marginalisation of the workforce, from 10% in 1991 to 35% in 2011, reflects the kinds of stress being built into the district's economy and its increased impoverishment.

### 2.3.2 The 'Main' Workers

Even within the main workforce (in the 2011 Census) more than 75% are in agriculture. Agricultural labour forms the bulk of the main workers at 45.5%. This proportion of agricultural labour and cultivators has seen a significant change, whereby, in the 2001 Census the cultivators constituted 41.8% and agricultural labour was 37.7% of the main workforce (Figure 14).

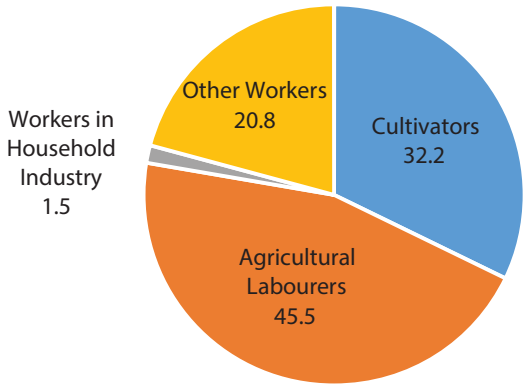



**Figure 14: Composition of the main workforce**

*Source: Analytical Report on Primary Census Abstract, Directorate of Census Operations, Madhya Pradesh (accessed from censusmp.nic.in)*

### 2.3.3 Average Daily Employment in the District

The sector-wise registered units (establishments) and the average daily employment provided by these units have been shown in Figures 15 and 16.

The State/public administration provides for the highest average daily employment in the district. Banking follows closely, as it also has the highest number of registered units (these include primary credit societies). Mining shows a single registered unit, which is the Pathakhera Coalfield with an average daily employment of 9000. Electricity (which would include generation, transmission, and distribution utility/ies), water supply and gas together provided 3854 daily employment on an average.

Coal mining and electricity generation, together referred to as energy industry in the district, is the only large-scale industry.

## 2.4 Manufacturing in the District

(Tahsil[3]-level data have been obtained from the office of the District Planning Officer, Betul to analyse coal's contribution to the district's overall growth. The period for which the available data has been assessed coincides with the time when the mining industry had entered a phase of decline. It must be noted that only available and adequate data have been analysed for this study.)

### 2.4.1 Major Commodities

Manufacturing on a large scale is completely absent. There are no major exportable products from the district.[4]

The District Census of 1989–90[5] shows that coal was a major exportable product from the district. Other commodities were agro and forest based, chief among them being jaggery chironji (spice seed), and groundnut.

In 2009[6], while coal continued to remain the principal commodity, new agro processed products like soyabean oil and flour came to occupy an important place. The state is the largest producer of soyabean in India, accounting for 50% of the country's production. The production of chironji seeds, once an important non timber forest produce (NTFP) declined from the region.



3 Each state in India is divided into districts. Each district is further divided into sub-districts known differently in different parts in the country (e.g., tahsil, taluka, community development [CD] block, mandal, etc.). Details available at https://censusindia.gov.in/Census_And_you/Administrative_division.aspx

Betul has 8 tahsils namely, Bhainsdehi, Athner, Betul, Chicholi, Ghodadongri, Shahpur, Multai, Amla. Source: Directorate of Census Operations, Madhya Pradesh, 2011

4 Ministry of MSME, Government of India. Brief Industrial Profile of Betul District, Madhya Pradesh

5 District Census. 1990. Statement VI, Industry and Banking Industry Profile of Betul

6 District Census. 2009. Statement VI, Industry and Banking Industry Profile of Betul

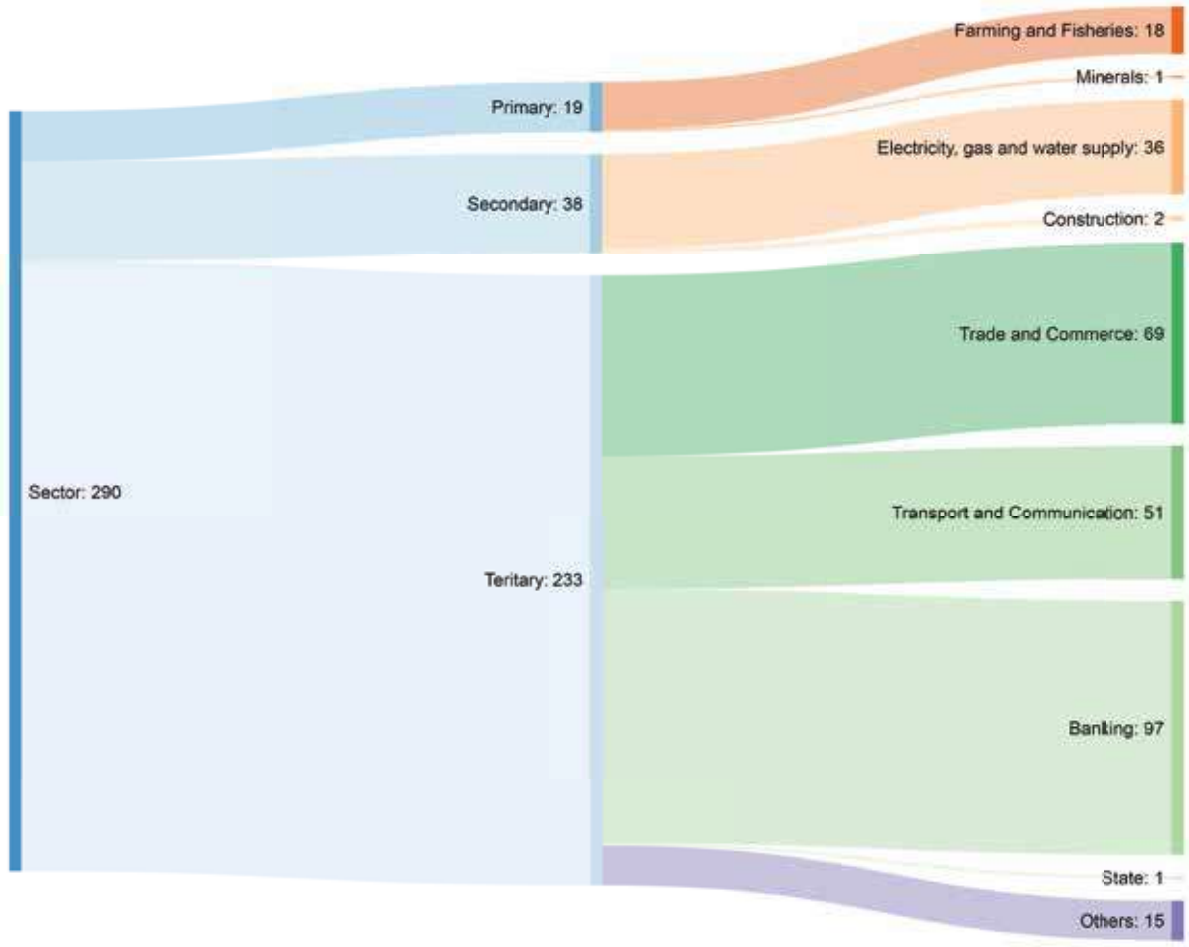



**Figure 15: Sector-wise units registered, 2011–12**

## *2.4.2 Micro, Small, and Medium Enterprises*

The district is dotted with micro, small, and artisanal units. Small enterprises have traditionally occupied an important place in the rural non-agricultural sector. Figure 17 shows the kinds of enterprises registered under MSME, their investments and the subsequent figure 18 shows the employment in these enterprises.

Despite the district being largely agricultural, agro-based registered enterprises are only a handful. The readymade garments, and the repairing and services are the key areas which have relatively more numbers employed.

**Distribution of enterprises in the district**

The MSME distribution across the district is quite uneven. Betul tahsil, which also is the district headquarters commands a major share of MSMEs.

Figure 19 shows that Ghodadongri tahsil, in which the energy industry is located, has not encouraged the development of MSMEs. The nature of the enterprises largely were limited to retail apparel, repairing and servicing units, wooden based furniture units, resulting primarily from the induced demand from the industry employees.

The nature of the industry is such that there are no backward linkages. The only forward linkage in the supply chain of coal is in transportation and trade.

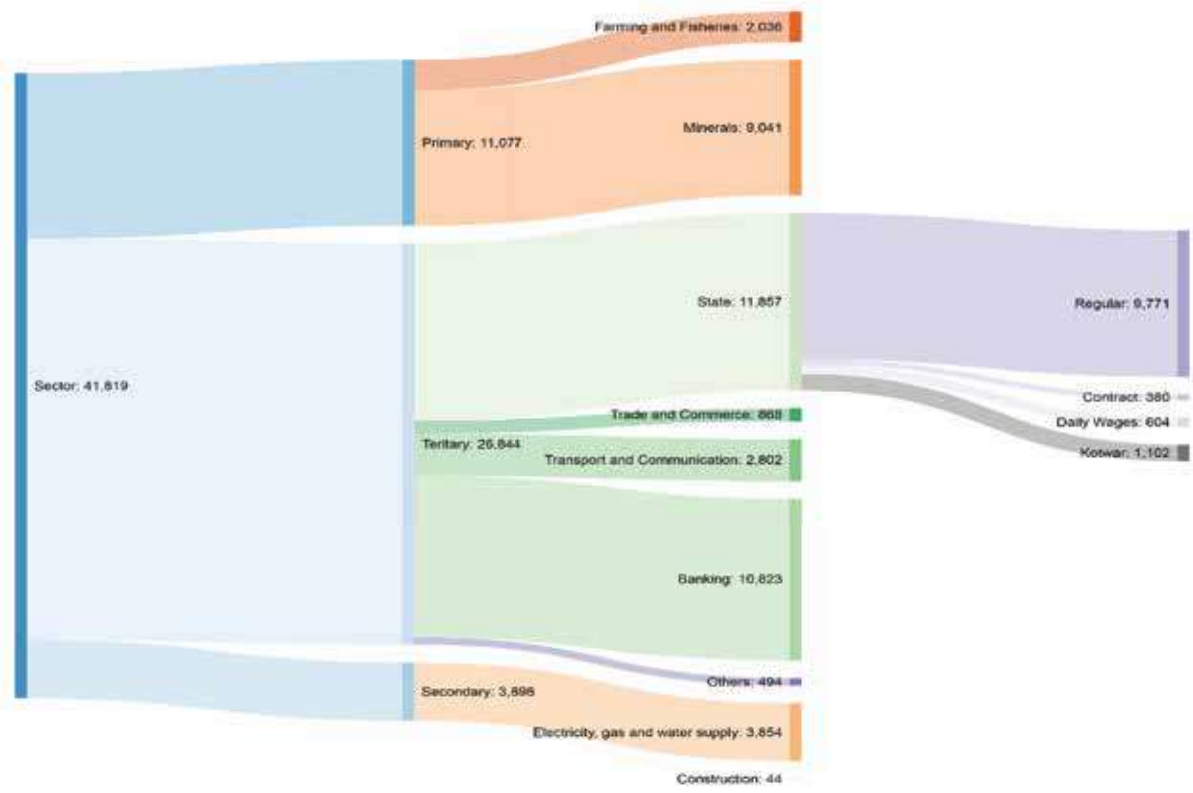



**Figure 16: Sector-wise average daily employment, 2011–12**

*Source: Office of the District Planning Officer, Betul*

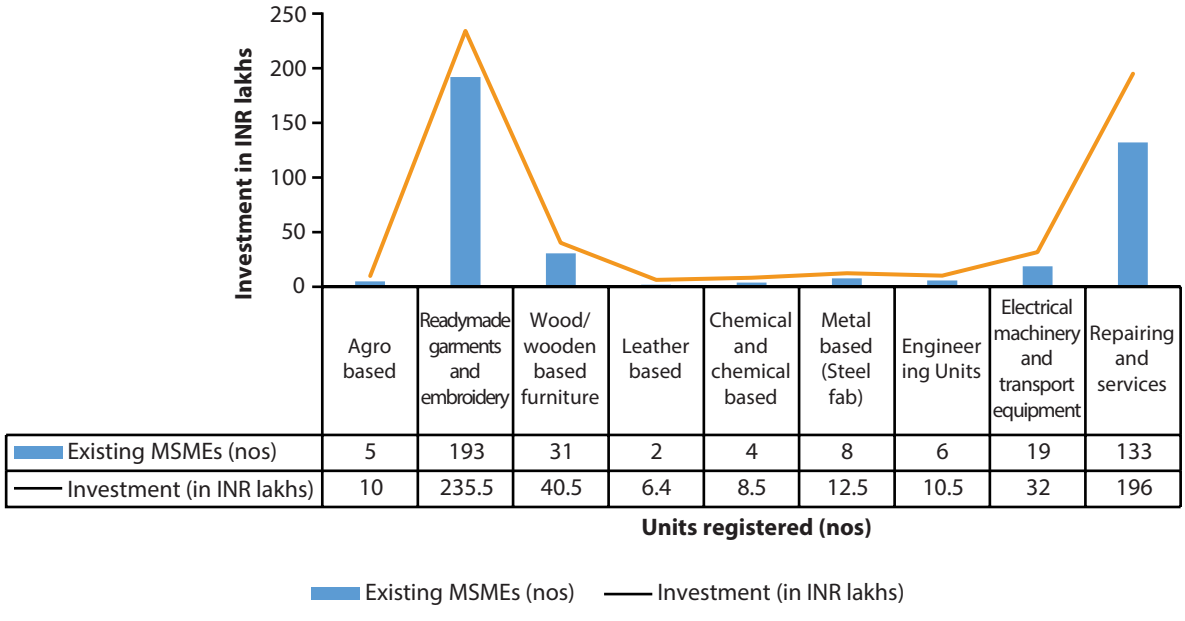



**Figure 17: Nature and size of MSME establishments**

*Source: Brief Industrial Profile of Betul District, MSME Development Institute, Ministry of MSME, GoI*

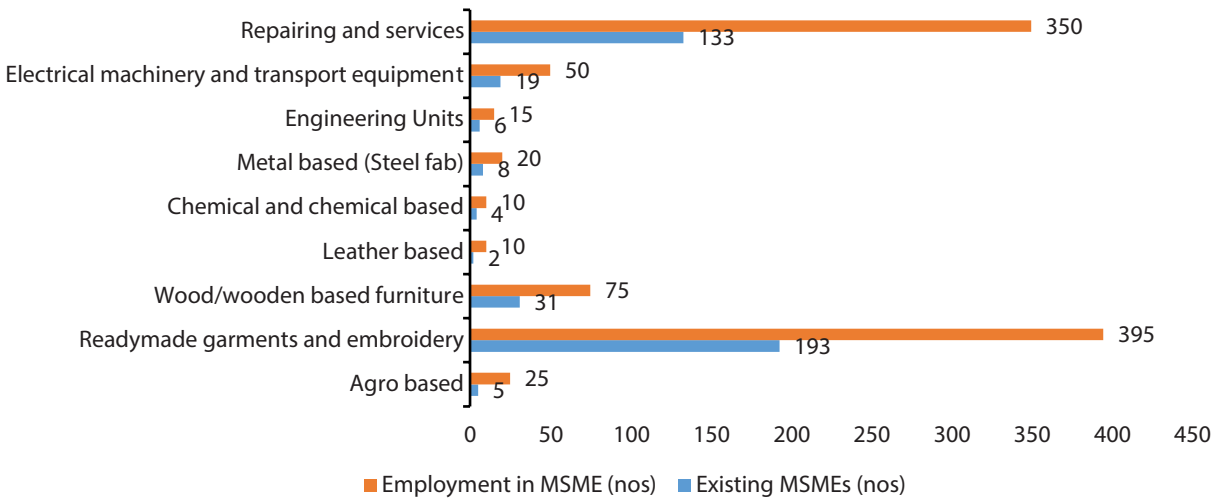



**Figure 18: Employment across various MSMEs**

*Source: Brief Industrial Profile of Betul District, MSME Development Institute, Ministry of MSME, GoI*

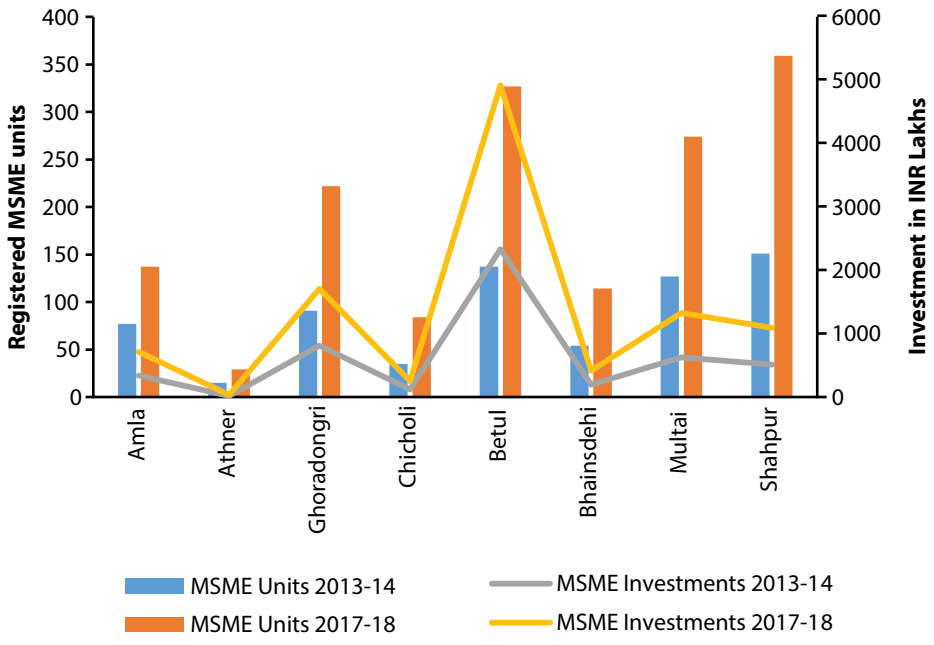



**Figure 19: Tahsil-wise distribution of MSMEs**

*Source: Office of the District Planning Officer, Betul*

From the kinds of work contracts rolled out in the region[7], it seems only the labour contract is given locally. Other high value contracts go outside the region. Moreover, the regional workshop of the industry caters to its service and maintenance needs.

The infrastructure beyond the industry area is weak. Further, it is difficult for the local enterprise to match with the industry's wage. The presence of

7 Contract-related information for the coalfields obtained from Contract Labour Payment Management Portal of Coal India Limited. Details available at https://clip.cmpdi.co.in/Forms/publicViewWO.php

the industry affects the wages locally. As a flour-mill owner in Mordongri village shares, he gets workers from Jharkhand to work seasonally in his mill. The local youth either seeks work in the industry (even if on a contract basis, as the industry pays a little more than the prevailing minimum wage) or migrates out in search of work.

Over the last 5 years, shop owners and small businesses have experienced disruptions in the market. Factors that have disrupted are- a) since the closure of three mines in 2013, no new mines have come up, bringing a slump in the economic activity in and around mining, b) there is a rapid de population of the place as the retired employee choose not to settle owing to the general decline in the place and c) increasing number of contractual workers as against the regular employees. The payment to the contract worker is extremely low as compared to the direct/ regular worker, hence the low purchasing power has resulted in reduced demand for goods and services in the local economy.

A few experiences of the local community are shared as Boxes 1, 2 and 3..

**Box 1: Coal mining from 2000-20: Viewpoint of a garment seller**

In 2000, Mr Chowdhary established his garment shop in Pathakhera market. That time, there were six other shops operating in the area. With the decline in the industry, his was the only shop that remained while others packed up. Once bustling with customers queueing outside shops, the market now wears a deserted look, recalls Chowdhary. The transition was stark. Since 2010, retired employees started moving out and shops began to either close or relocate to Betul town. As contract workers started to fill in, the purchasing power in the area lowered too.

From a strength of 13 employees in 2005, Chowdhary was forced to reduce them to six. From a peak turnover of INR 5.5 in 2010, he could barely realize INR 2 crore in 2019.



**Box 2: Diversification : Pawar's survival strategy**

In the Pathakhera market, Mr Pawar has various businesses. He runs a wholesale grocery store as well as owns trucks for coal transportation. He shares, he has been able to survive the decline in the local economy only because of his diverse businesses. Smaller retailers have packed up, says Pawar.

From once an owner of twenty-five trucks to only eight now, he points out that the quantity of coal through auctions from Pathakhera Coalfield, has declined considerably, affecting the sales of coal through road transport. He earlier supplied coal to two industries in the district using coal boilers- a yarn/fabric mill and a soya oil mill. Due to non availability of coal from Pathakhera, the yarn mill is now procuring coal from Nagpur and the soya mill has closed (it was based in the district due to availability of cheaper coal locally).

*'By 2022, when the workers of the 1982 batch of coal miners retire, this place will see its worst'*, remarks Pawar.

**Box 3: Vanishing coal : a tea seller's woe**

Aslam Khan's humble tea and sweetmeat shop in the Shobhapur market, wears a deserted look on a Monday afternoon. 'There was a time, when this shop was teeming with people, especially workers in between the shifts. I had to employ 3 workers to cater to the footfalls. But since the last seven years, hundreds have retired and have migrated out. My business, just like other businesses here, has shrunk. My son pursued a diploma from ITI in the hope of finding a job in the energy industry, but now he is looking out for work. We never imagined; coal will ever go!'

## 2.5 Coal's Influence on the Development Pattern

**Brief on the district**

Development in the district has not been homogenous. There are huge inter-tahsil as well as rural and urban disparities in services and developmental activities. Growth has largely been limited to the tahsil towns of Betul and Sarni. Performance on some of the growth indicators and service provision of Betul tahsil is largely attributable to it being the administrative hub of the district. For Sarni (in Ghodadongri tahsil), coal is at the foundation of its economy. Against some indicators, Ghodadongri holds a lion share (mostly the urban Ghodadongri), and for the rest, it is second only to Betul tahsil.

It also brings us to understand the relation between the district administration/state and the public sector undertaking (PSU). Where the PSU took responsibility, although limited (limiting itself to investments in building infrastructures related to mining and in its township, or through Corporate Social Responsibility in a pre-defined radius), it did influence the district's injection of resources in the place. Some of the indicators discussed in subsequent sections, show that rural Ghodadongri (the tahsil where the energy industry is located) has the lowest achievements across the district.

The total population of the district is 1,575,362 and the urban population occupies a share of 19.62% (Census 2011)[8]. The district has 1399 villages and 10 towns.

1. Statutory Towns and their population
    a. Municipal Towns – Betul (103,330), Sarni (86,141), Amla (30,215), and Multai (29,976)
    b. Nagar Panchayats – Bhainsdehi (11,961), Athner (11,915), Betul-Bazar (10,630), Chicholi (9282)
2 Census Towns and their population – Ghodadongri Ryt (9745), Dhodramohar Alias Bhoura (5956)

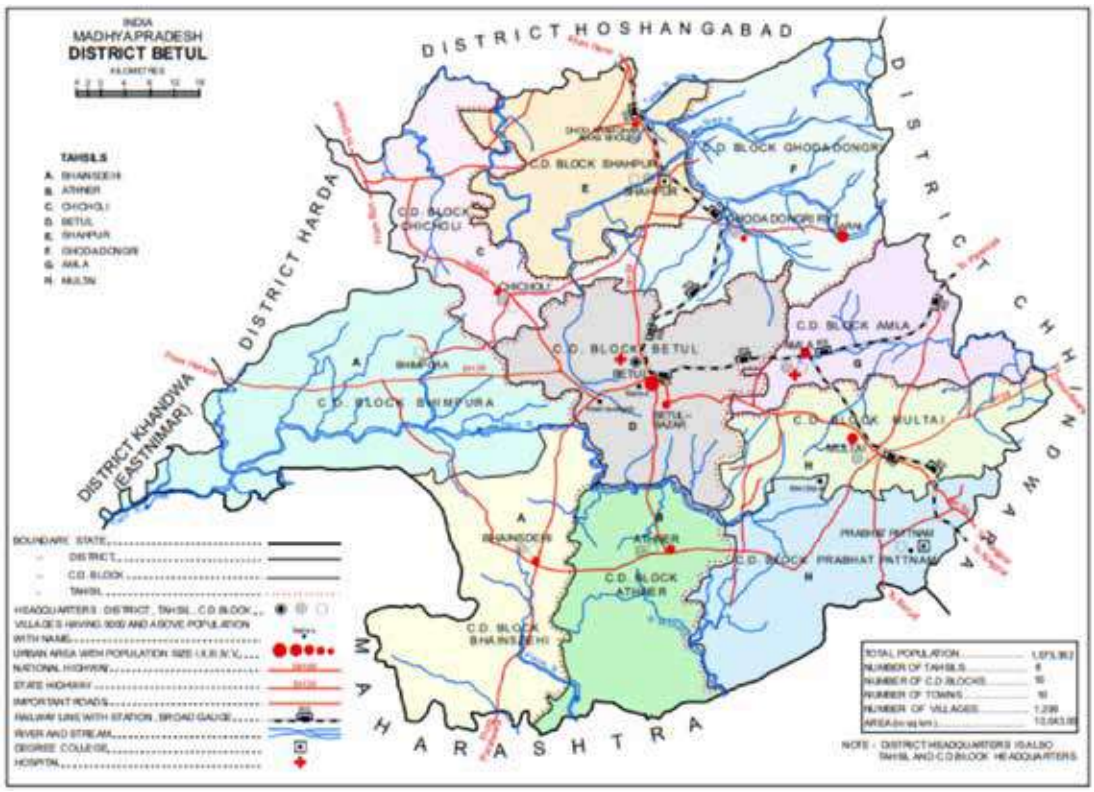



**Figure 20: Administrative map of Betul**

8 Part XII B, District Census Handbook, 2011 Betul

Shahpur, which was identified as a Census Town in the 2001 Census, failed to satisfy the demographic and economic criteria and was hence de-classified in the 2011 Census. The Betul municipal town houses the office of the District Collector and consequently headquarters all the functions of land revenue, law and order, and development of the district. The Sarni municipal town is where the energy industry is located. Amla is prominent because of the Indian Air Force base. Multai gained popularity because it is an important pilgrimage centre from where River Tapti originates.

The following section compares the coal tahsil with the others in the district to bring out the influence that coal and power plant combined have in the region.

## *2.5.1 Comparison of Coal Tahsil with Other Tahsils*

### 2.5.1(a) Coal and Urbanization

After the energy industry was set up and strengthened in Sarni, people gradually started to migrate to the place in search of employment and to take up ancillary and support services to the industry workers. Urban areas usually come up around the mines. The Sarni Municipal Council was set up on 8 December 1978, under Section 341 of MP Municipalities Act, 1961 to cater to the settlements that grew in the periphery of the industry.

Figure 21 shows the growth of the two key towns in the district – Betul and Sarni.

Betul town witnessed a 55% increase in its population between 1961 and 1971, the period when the industry was being set up. At the time Sarni town was being carved out, the two towns had similar population. It was only by 1991, when there were massive recruitments in the energy industry, particularly in mining, that Sarni witnessed an 81% jump in its population while Betul town saw a 38% increase (Figure 21). The last census saw Sarni's population reduce by almost 10%, largely owing to the decline in the industry and the retired employees moving out.

### 2.5.1(b) Coal and Infrastructural Development

The energy industry emerged as a strong player in the region, particularly in the immediate town and tahsil it was located. Mining activities require a certain set of physical infrastructure (roads and communications), hence, a cluster of economic activities developed around mining. Sarni, bustling with economic activities, attracted businesses, investments, and infrastructure. Such was the level of infrastructural development in the region that for the local residents, the infrastructure provided by the



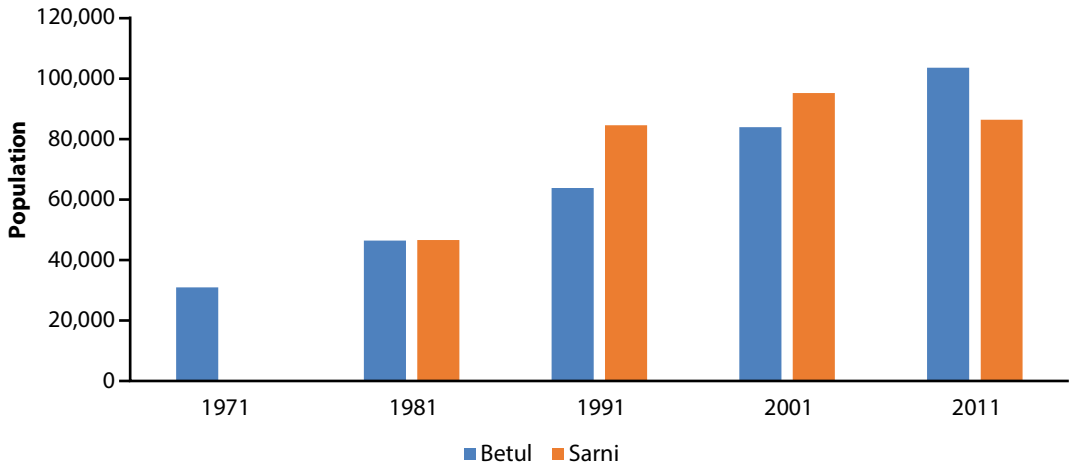



**Figure 21: Growth of key towns in the district**

*Source: District Census Handbook, Betul (accessed from https://censusindia.gov.in/2011census/dchb/MPTables.html)*

PSU was far more important than that provided by the state.

The following sections discuss the availability of infrastructure in the region, including transport, banking, and civic amenities. The distribution of most of these assets is skewed in the mining tahsil of Ghodadongri.

**Coal and transport infrastructure**

*Road*

Ghodadongri shows a relatively higher density of both metalled and unmetalled road in the district, developed because of the energy industry (Figure 22).

*Railways*

Betul falls under the jurisdiction of the Nagpur division of the Central Railways. According to the railway officials, there are three main railway stations in the district namely, Betul, Ghodadongri, and Amla. The Ghodadongri railway station was set up prior to 1925 (exact year is not available). It was primarily to transport coal to Bombay to fuel the steam ships. In 2019, this station handles 1008 passengers per day on an average, with earnings at INR 1.27 lakh (per day). As per the office of the Divisional Railway Manager, Nagpur, a growth of 8–10% in traffic and earnings is estimated from this railway station, every year.

**Coal and civic infrastructure**

*Piped sewerage*

While the overall district has only 1.8% households with piped sewer connectivity, amongst the tahsils, Ghodadongri accounts for the largest share (although rural and urban differ greatly at 1.2% and 14.8%, respectively), followed by Betul tahsil (Figure 23).

*Septic tanks*

Septic tanks are more common across the district. Betul tahsil has the highest percentage of households with septic tanks, followed by Ghodadongri (Figure 24).

*Drainage connectivity for waste water outlet*

According to 2011 Census, 70.37% of households in the district are without any type of drainage connectivity. Of the remaining 30% with access to drainage, 26.48% use open drainage and only 3.15% use closed drainage. The urban Ghodadongri fares better than Betul in terms of the households with access to drainage. The rural-urban disparity is so stark, that across district, it is rural Ghodadongri that has the maximum households without drainage (Figure 25) .



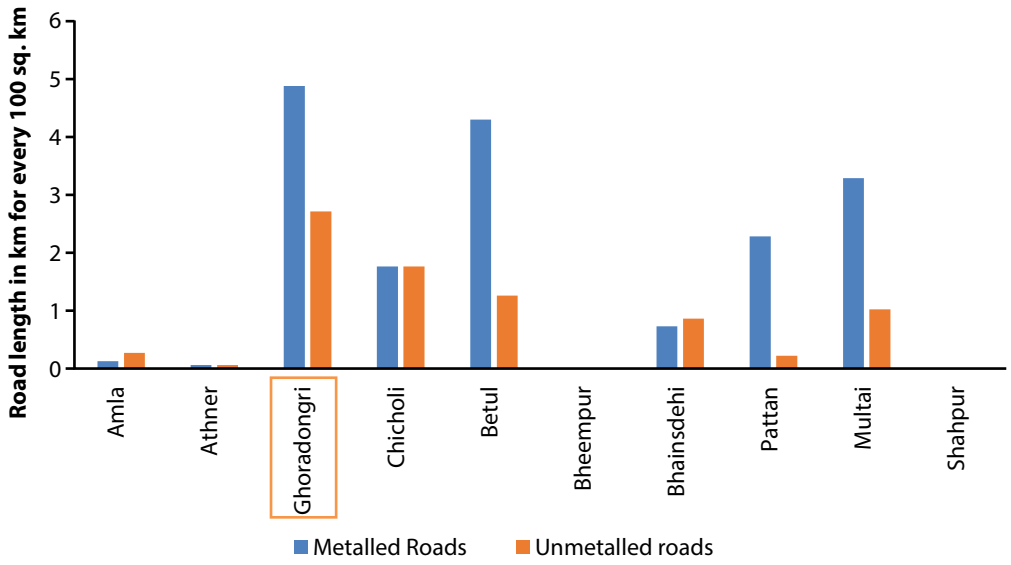



**Figure 22: Tahsil-wise road density, 2012–13**

*Source: Office of the District Planning Officer, Betul*


| | Bhainsdehi | Athner | Betul | Chicholi | Ghodadongri | Shahpur | Multai | Amla | District |
|---|---|---|---|---|---|---|---|---|---|
| Urban | 0.8 | 0.23 | 2.81 | 0.57 | 14.88 | 0.08 | 0.78 | 7.29 | 6.65 |
| Rural | 0.47 | 0.38 | 1.08 | 0.63 | 1.22 | 0.4 | 0.54 | 0.33 | 0.63 |

**Figure 23: Tahsil-wise households with piped sewerage**

*Source: Census of India 2011, District Census Handbook, Betul*


| | Bhainsdehi | Athner | Betul | Chicholi | Ghodadongri | Shahpur | Multai | Amla | District |
|---|---|---|---|---|---|---|---|---|---|
| Urban | 52.59 | 46.12 | 74.31 | 69.36 | 41.65 | 41.59 | 67.31 | 67.29 | 59.67 |
| Rural | 3.66 | 6.14 | 13.06 | 4.46 | 9.59 | 8.82 | 7.42 | 6.79 | 7.34 |

Rural Urban

**Figure 24:Tahsil-wise households with septic tanks**

*Source: Census of India 2011, District Census Handbook, Betul*



*Drinking water supply*

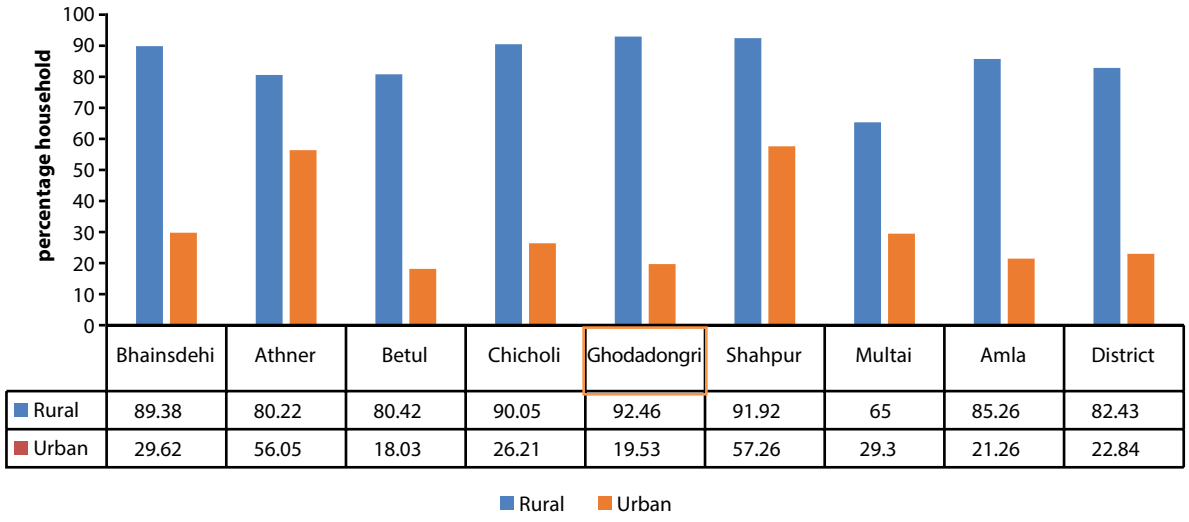
The 2011 Census shows that the percentage of households accessing tap water from treated sources is highest in urban Ghodadongri (with rural only at 2.4%), followed by Betul, which is at 18.2% (rural at 6.9% and urban at 34.2%). Rural areas continue to lag behind in the district (Figure 26).

The stark differences between rural and urban households in the mining tahsil, in accessing services such as sewerage and drinking water, show that economic growth and consequent infrastructure development remain confined to the urban agglomeration leaving behind the rural neighbourhood.

### 2.5.1(c) Coal and Banking Services

The urban area of Ghodadongri has six nationalised banks[9], ranking second to Betul. Ghodadongri has

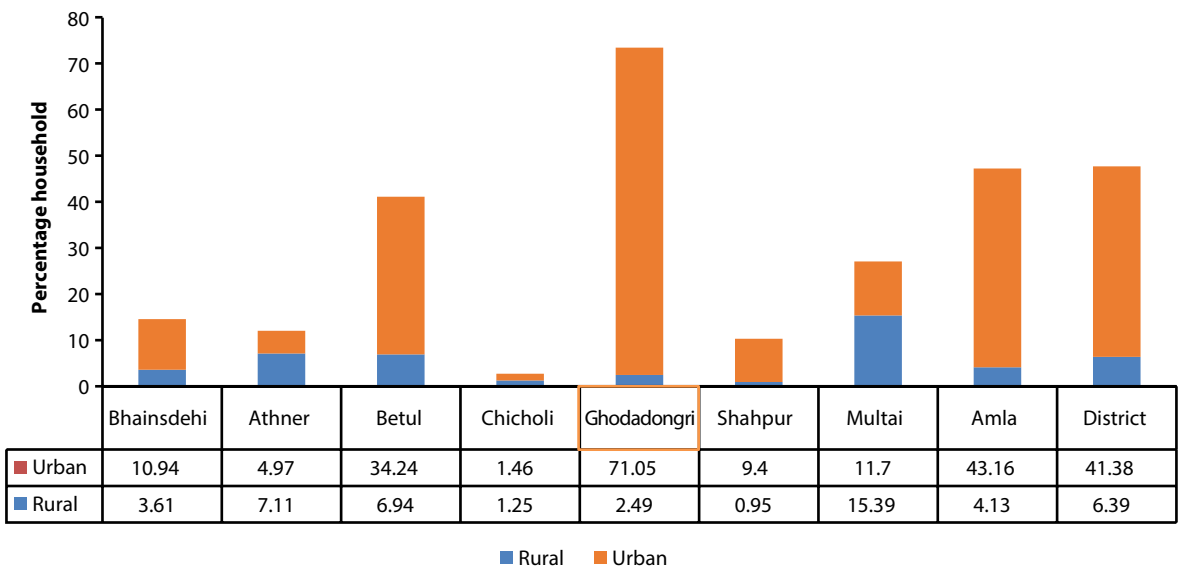
9 District Census. 2009. Statement VI, Banking and Industry. Details available at https://censusindia.gov.in/2011census/dchb/MPTables.html




| | Bhainsdehi | Athner | Betul | Chicholi | Ghodadongri | Shahpur | Multai | Amla | District |
|---|---|---|---|---|---|---|---|---|---|
| Rural | 89.38 | 80.22 | 80.42 | 90.05 | 92.46 | 91.92 | 65 | 85.26 | 82.43 |
| Urban | 29.62 | 56.05 | 18.03 | 26.21 | 19.53 | 57.26 | 29.3 | 21.26 | 22.84 |

**Figure 25:Tahsil-wise households without any kind of drainage facility**

*Source: Census of India 2011, District Census Handbook, Betul*




| | Bhainsdehi | Athner | Betul | Chicholi | Ghodadongri | Shahpur | Multai | Amla | District |
|---|---|---|---|---|---|---|---|---|---|
| Urban | 10.94 | 4.97 | 34.24 | 1.46 | 71.05 | 9.4 | 11.7 | 43.16 | 41.38 |
| Rural | 3.61 | 7.11 | 6.94 | 1.25 | 2.49 | 0.95 | 15.39 | 4.13 | 6.39 |

**Figure 26: Tahsil-wise households with treated tap water**

*Source: Census of India 2011, District Census Handbook, Betul*

the highest percentage of households availing bank services at 74.7%. The share for Betul tahsil stands at 63.2% (Figure 27).

### *2.5.2 Coal and Electricity Consumption*

While the average growth in electricity consumption in Betul is positive, there was an unusual dip in the share of industry sector in electricity consumption. The industrial share which was by far the highest amongst the various sectors of consumption till 2008–09, fell by 97% the following year. Aside the auxiliary power consumption by STPS, this period also saw the construction of newer units of STPS which explained the high share of the industry. The officials of MPMKVVCL (Madhya Pradesh Madya Ksetra Vidyut Vitran Company Limited) say that the

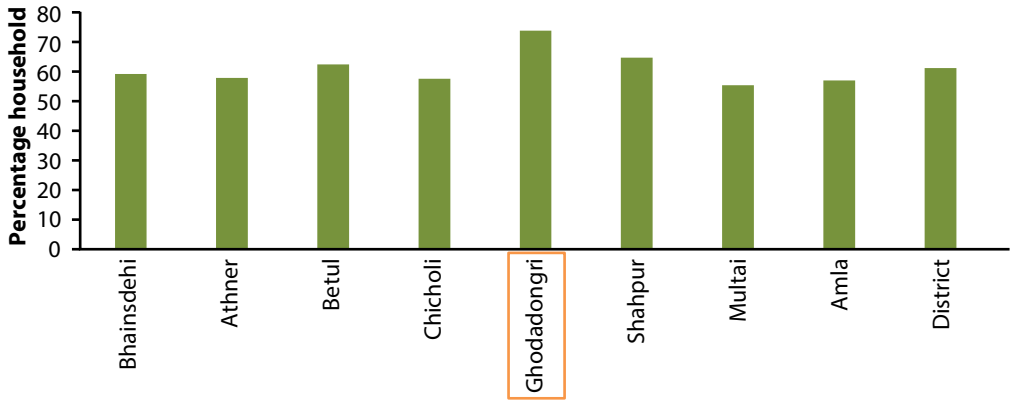



**Figure 27: Tahsil-wise percentage of households availing banking services**

*Source: Census of India 2011, District Census Handbook, Betul*

dip was primarily on account of the five units of STPS that were de-commissioned. These were replaced by more energy-efficient units. Further, only two units of the plants have been functional since 2015 (Figure 28).

### *2.5.3 Transport, Trade around Coal*

The only forward linkage that mining in the region offers is in transport and trade of coal. This section looks at the supply chain from transporting mined coal to the power plant and subsequent transport of flyash to the ash pond/dyke or to industries (cement, brick kilns). It also understands the nature of trade that emerged around coal.

When the mines started in the 1960s, along with the workers came the traders too. Merchants started their trade from and supplied coal to as far as Gujarat. Businesses related to civil works and maintenance boomed in the region. Housing, infrastructure (including schools, hospital, banks, roads amongst others) needs, particularly those catering to the township attracted businesses.

*Transportation of coal*

Transport of coal occupies a central position in the economy of the region, commanding 75% of the total coal transport share to STPS. Conveyor belt carries the rest. Truck owners and coal transporters found



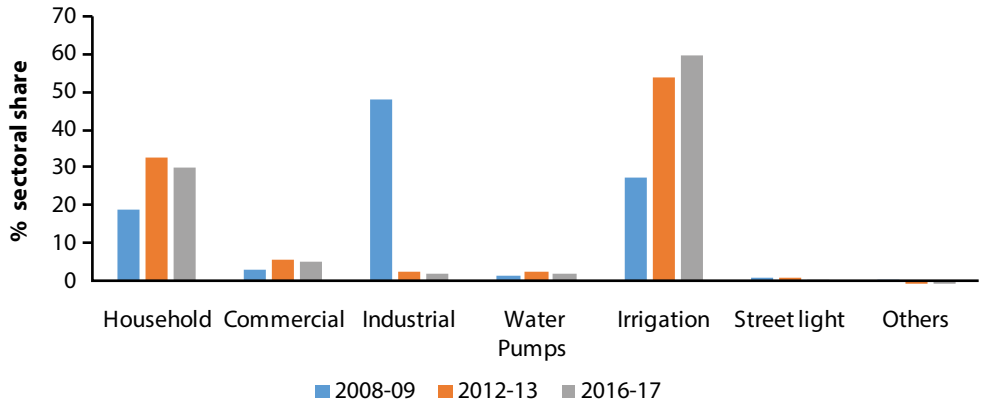



**Figure 28: Sector-wise electricity consumption in the district**

*Source: Office of the District Planning Officer, Betul*

immense opportunity in this region. The President[10] of Kalimai Truck Owners Association in Pathakhera remarks, '*In the earlier days, the production from the Pathakhera-I (PK-1) mine alone required a hundred trucks a day to transport the produce.*'

Coal transportation brings with it its own set of ancillaries. The Area Sales Manager, Pathakhera Coalfield, shares that 75% of the businesses in the area are around transport and 10–15% cater to coal trading. Coal is being regularly sold through e-auctions and traders from major cities such as Bhopal, Indore, and Nagpur participate in the online coal auctioning. They appoint their authorized agents in Pathakhera to collect coal on their behalf.

As the quantity of coal under e-auction increases (according to officials, given that Pathakhera is UG mine with higher cost of production, they can put up higher quantities of coal in auctioning for better revenue realization) along with the distance to which it is transported, so does the economy of the region. On an average, transportation and trading charges per tonne of coal is INR 2000. This includes coal handling (loading, sorting, tarpaulin cover, and others).

The Association members shared that 2000–12 was a glorious period for business. After 2012, there has been a downfall in business as coal production was not enough to meet the requirements of the power sector, let alone cater to the non-core sectors (industries using coal boilers). Part demand of coal was also met by importing coal. Businesses which were around civil works, used coal as an input/raw material, or those which traded only in coal, either closed their operations or eventually moved out. The coal transporters in the region are a powerful voice and this economy has carved out its own space. They have been demanding not only the opening of new mines but also setting up of more units of power plant and a cement industry (given the availability of flyash) in the area.

Although there is no exact number on the traders and transporters of coal in Pathakhera, their associations, the Kalimai Truck Owner Association and Kalimai Vyapari (Traders) Sangh, estimate that 350 trucks ply in the area and about 6000 people are engaged in the value chain across coal transportation and coal trading in the region.

*Transportation of fly ash*

Besides coal transportation from WCL, STPS floats tender for its fly ash transportation (Picture 2), based on the tentative production plan of WCL. Dry fly ash transportation from the power plant for industrial, civil construction, and other works assumes significance in the overall economic scenario. While the older units do not have dry fly ash collection systems, the newer ones have silos to collect the same. The



**Picture 1: Fly ash dumpers waiting at the STPS**

10 Jaswinder Singh

**Picture 2: Coal trucks dot the road between Sarni and Pathakhera**

bottom ash generated is deposited through slurry in the ash pond, spread over an area of 614 ha. Separate tenders are invited for collection of cenosphere.[11]

*Commercial activity around fly ash*

The Ministry of Environment, Forest and Climate Change (MoEFCC) has issued notifications mandating the utilization of fly ash for cement for construction activities within a radius of 300 km from the power plant. Fly ash generated in the power plant is supplied free of cost to brick kilns and for other construction activities. Fly ash generation from the older units is

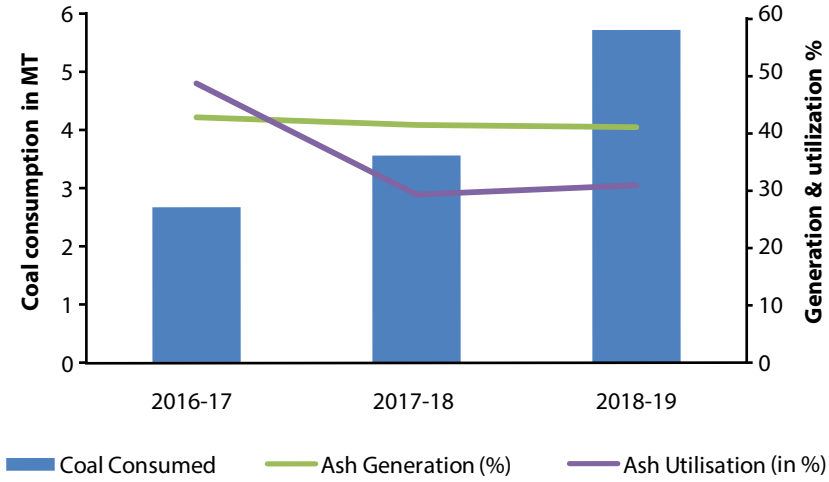



**Figure 29: Generation and utilisation of fly ash, STPS**

*Source: Office of the Chief Engineer, STPS, Sarni*

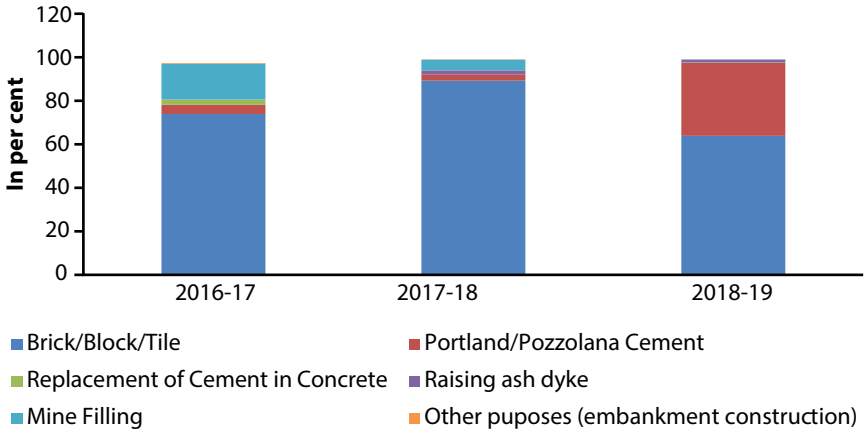



**Figure 30: Fly ash consumption for various purposes, STPS**

*Source: Office of the Chief Engineer, STPS, Sarni*

11 A microscopic ball of silica-aluminium, found on ash ponds and used in improving the quality of manufactured products. Used as filler-lubricants in oil drilling operations, paints, filler industries.

approximately 3600 MT per day and from the new units is 2200 MT per day.[12] Figures 29 and 30 show the fly ash utilization rate at STPS and those sectors where fly ash generated has been consumed.

## 2.6 Coal and its Proceeds

Proceeds from coal is an important revenue source for the district and local bodies. Officials of the district administration and municipal body shared that most of the programmes and schemes implemented are financed from the coal proceeds. In 2016-17 when the coal production declined, receipts from the coalfield shrunk by 20–25%. Figure 31 shows the composition of coal proceeds of Pathakhera Coalfield.

The MPGATSVA and the Transit fee are unique to the state. Brought about in 2005, the Madhya Pradesh Grameen Avsanrachna evam Vikas Adhiniyam or (MP Rural and Road Development Act) tax is levied for rural infrastructure and road development with special emphasis on backward and mining area. The high composition of this tax in 2010–11 is due to payment of earlier dues. Transit fee, levied since 2000, is the transport fee paid to the Forest office at the district level for transporting coal through the forest area.

District Mineral Fund (DMF): A Centre for Excellence for Mining Affected Area, with the objective to develop a *District Prospective Plan* and identifying the needs of the mining affected families has been set up in the district in 2020.

The fund is also proposed to meet some of irrigation and culvert infrastructure needs of the district besides health and education.

### *2.6.1 Revenue Source for District and Local Munical Body*

Royalty from coal is an important revenue source for the district. From the available data of 2012–13, royalty from coal accounted for 33% of the district's non-tax revenue (Figure 32).



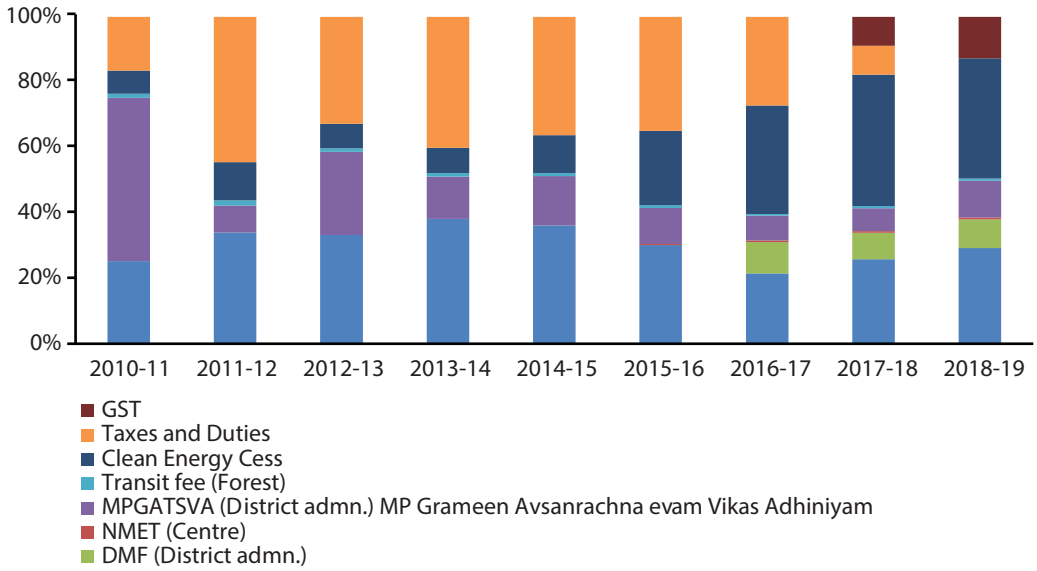



**Figure 31: Composition of coal proceeds from Pathakhera Coalfield**

*Source: Office of the Area General Manager, Pathakhera Coalfield*

12 Sourced from an EOI document for free supply of fly ash from Satpura Thermal Power Station, Sarni, Specification No 08-004/P&W/Fly ash/EOI

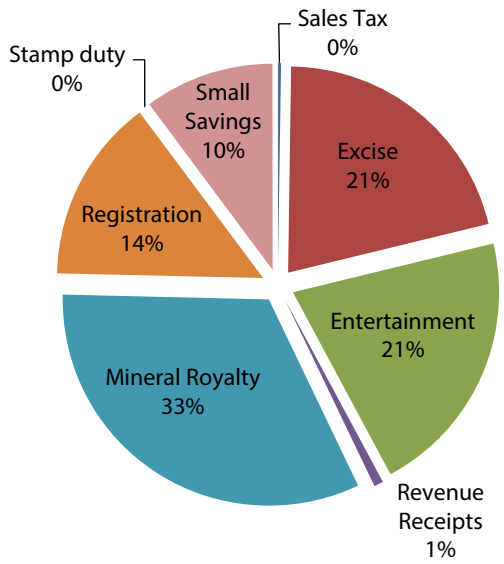



**Figure 32: Share of royalty in the non-tax revenue of the district, 2012–13**

*Source: Office of District Planning Officer, Betul*

The Sarni Nagar Palika realizes a major chunk of its own revenue from the property tax from Pathakhera Coalfield and Satpura Thermal Power Station. Unlike the property tax levied on non-industrial wards, where full realization is difficult, the property tax from these two industries are realized in full each year.

About 74% of the local body's revenue comes from the energy industry (Figure 33). It was because of this assured revenue, that Sarni was once counted as a well-performing local body.

Sarni claims an important place in the district's overall economy. From figures on annual incomes of municipal bodies and nagar panchayats, it is evident that after the Betul municipal body, it is Sarni that occupies the next important place and together, these two bodies have seen a substantial growth in their respective incomes over the years (Figures 34 and 35). The remaining two, Amla and Multai, have seen reduced incomes, particularly Amla, which witnessed a steep fall in three years (2011–14). The annual incomes of the rest of the nagar panchayats are less than INR 3 crore. The major share of their incomes comes from the grants they receive from the state government for developmental works and schemes and the remainder is earned from taxes on markets, water, and other utility services (as discussed in the preceding section being fairly limited).

According to the Chief Municipal Officer of Nagar Palika Sarni, the formation of the Municipal Council of Sarni comprising the notified areas of Sarni, Satpura Thermal Power Station, Pathakhera and others was



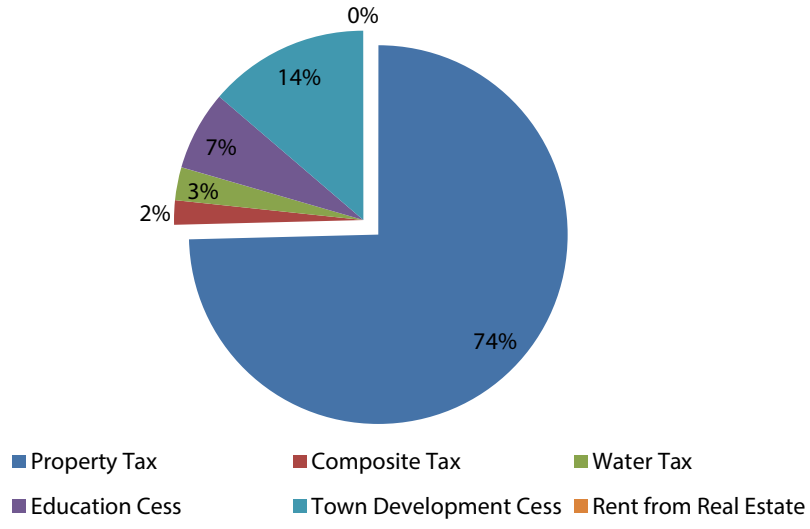



**Figure 33: Share of property tax from energy industry, Sarni Municipal Council, 2018–19**

*Source: Office of the Chief Municipal Officer, Sarni Municipal Council, Sarni*

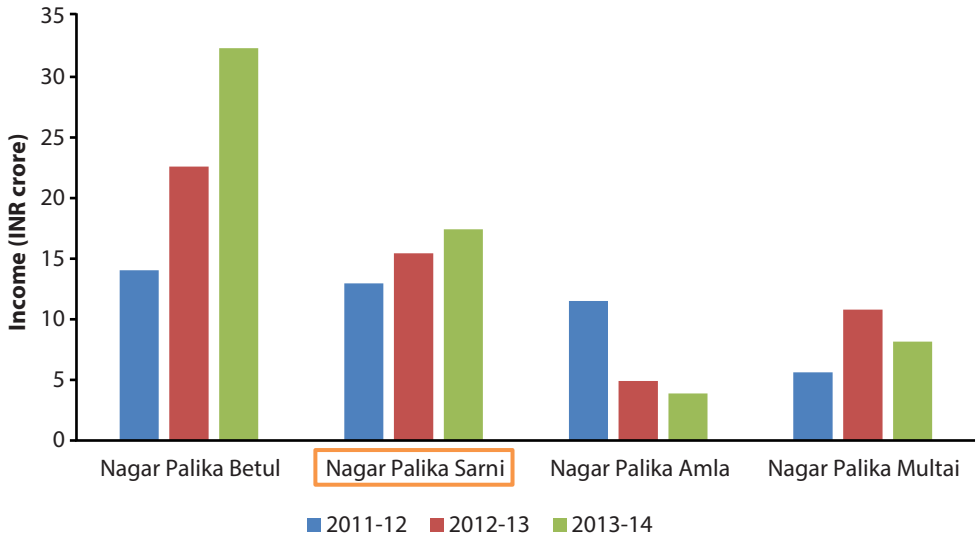



**Figure 34: Annual income of the municipal bodies in the district**

*Source: Office of the District Planning Officer, Betul*

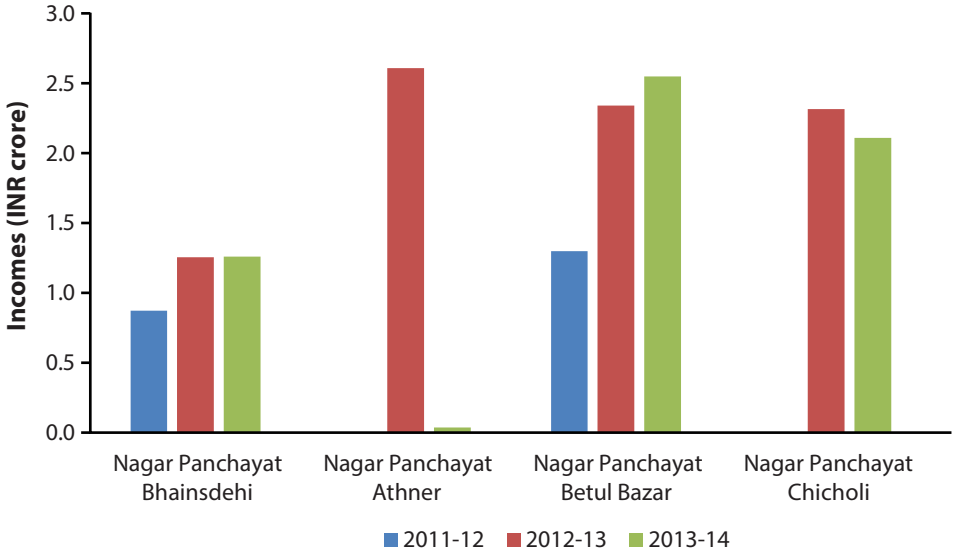



**Figure 35: Annual incomes of nagar panchayats in the district**

*Source: Office of the District Planning Officer, Betul*

a political decision. The economic returns/impact of the energy industry was such that it induced the state to set up a local body. 'There was a demand from the place that this area being a gram panchayat should be named a nagar panchayat,' remarked the Chief Municipal Officer.

The municipal finance of Sarni is directly corelated to the growth of the energy industry. There has been a gradual decline in the property tax that is demanded from the two industries. As employees are retiring and leaving the place, old quarters built by the industries are being pulled down, thereby leading to a fall in the demand for property tax.

The property tax was revised in 2018 following the last revision in 1995 (primarily to compensate the local bodies for the elimination of taxes like the entry tax on coal, due to imposition of GST). The fall in the demand for property tax from the energy industry was particularly from Pathakhera Coalfield (Figure 36).

### *2.6.2 Corporate Social Responsibility Expenditure*

To exercise its responsibility in the area it operates, the coalfield engages with the community through its corporate social responsibility (CSR). Usually, it covers villages within an 8-km radius and adopts some to make them 'model' villages. Spending is largely on infrastructure building, particularly for schools including construction of toilets, water supply in school toilets, community halls, ensuring drinking water provisions, building, and tarring of village roads among others. It also undertakes skill training, awareness camps on health and sanitation, and sport activities. Though there is not a fixed expenditure amount, the infrastructure provided by the coalfield, especially roads and handpumps are far more consequential to the communities than that provided by the state.

Some of the key activities undertaken in the last three years are given in Table 3.

**Table 3: Key activities under CSR, 2016–19**

| Healthcare | Infrastructure development | Skill development |
|---|---|---|
| Sanitation awareness campaign | Construction of toilets in schools and water supply under Swachh Vidyalaya Abhiyaan | Electrical/ mechanical/ pipe fitter |
| Provision of compost pits | Road construction | Welder |
| Health awareness camps | Road tarring | Auto mechanic |
| | Handpump installation | Nursing assistant |
| | | Coal sampling |
| | | Underground (UG) mine work |

However, a Senior Officer shared, 'There are many overlaps in operations and initiation of developmental works with the administration and the local municipality. For most times, the burden of developmental work falls on the coalfield and on STPS. Despite having taken care of the infrastructural development, there is no recognition of our contribution.'

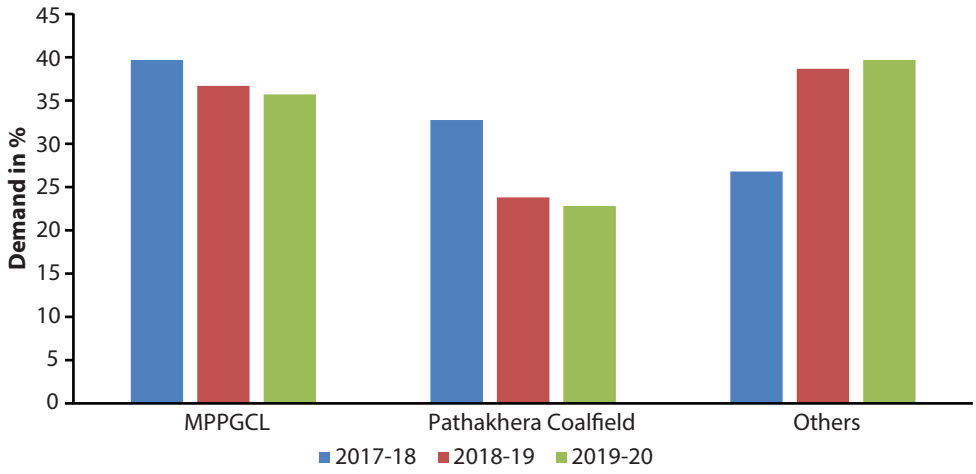



**Figure 36: Property tax demand, Sarni Nagar Palika**

*Source: Office of the Chief Municipal Officer, Sarni Municipal Council, Betul*

### *2.6.3 Worker Compensation*

As discussed in the beginning of this chapter, about 23% of the district's average daily employment goes in mining and 9% is in electricity, gas, and water supply categories. The Pathakhera Coalfield provides both direct and indirect employment. However, the direct employment rate has been declining over the years. From a regular workforce strength of 8600 in 2008–09, the number reduced to 5000 within a decade. The net decline of the regular workforce was a natural outcome of retirements often exceeding new intakes.

*Salaries and pension*

Direct jobs in the coal industry are high paying formal jobs. Additionally, owing to the underground (UG) nature of work, miners get an additional allowance. Since the year 2010, labour incomes through the coalfield have seen a 115% increase. A Joint Bipartite Committee for the Coal Industry (JBCCI) of Coal India and Central Trade Unions periodically revise wages for coal workers. With the IX and X National Coal Wage Agreements, the years 2012 and 2018 saw a steep hike in the labour incomes, resulting in the economy realizing close to INR 700 crore of labour income in 2018.

*Contract economy*

Over the years, the contract workers' economy or the informal economy has gained momentum. It is gauged from the fact that the value of contracts given out locally has trebled between 2009 and 2019. The period when the three mines closed (2010–13), the contract value rolled out also witnessed a dip.

Contracting of work in the coalfield is done for three major purposes, including mining, official transportation (vehicle supply for the industry's officials), and civil and construction work. Recently, an increasing trend of outsourcing work to private contractors for mining gained significance in the coal economy. Though a detailed break-up for each contract is not available, reliable sources shared that contract work for mining, particularly for labour supply and official transportation, is managed by local contractors. High-value contracts go outside the region, thereby implying a significant portion of the revenue flowing out.

Besides taxes and salaries, the coalfield spends on the school and medical services for its employees. A conservative estimate of the financial resources injected by the coalfield in the region's economy is approximately INR 900 crore.

## 2.7 Impact of the Incomes from Mining on Final Demand for Goods and Services

The energy industry has a more significant and marked economic impact on its urban than its rural vicinity. The formal jobs that it generated, created a whole new class of workers. It is, in fact, this public sector employees that spurred a whole set of induced jobs and demand for goods and services.

The 2011 Census figures show the status of household ownership of assets in Ghodadongri, and this is clear that this tahsil performs relatively better than the rest. Some of the following indicators are taken to suggest the differential:

1. Ownership of two-wheelers – bicycles and motorized vehicles (Figure 37)
2. Ownership of mobile phones (Figure 38)
3. Ownership of laptops/computers (without Internet) (Figure 39)

To sum up, within the district, the urban households of Ghodadongri tahsil are economically better off as evident from their ownership of assets. The Census 2011 covered the ownership of the assets, as given in the subsequent table. The graph shown in Figure 40 represents the status of the tahsil-wise households, which have no ownership of any of the mentioned assets.

| | | |
|---|---|---|
| Radio/ transistor | Television | Computer/ laptop with Internet |
| Computer/ laptop without Internet | Landline telephone | Mobile telephone |
| Bicycle | Motorized two-wheelers | Car/jeep/van |

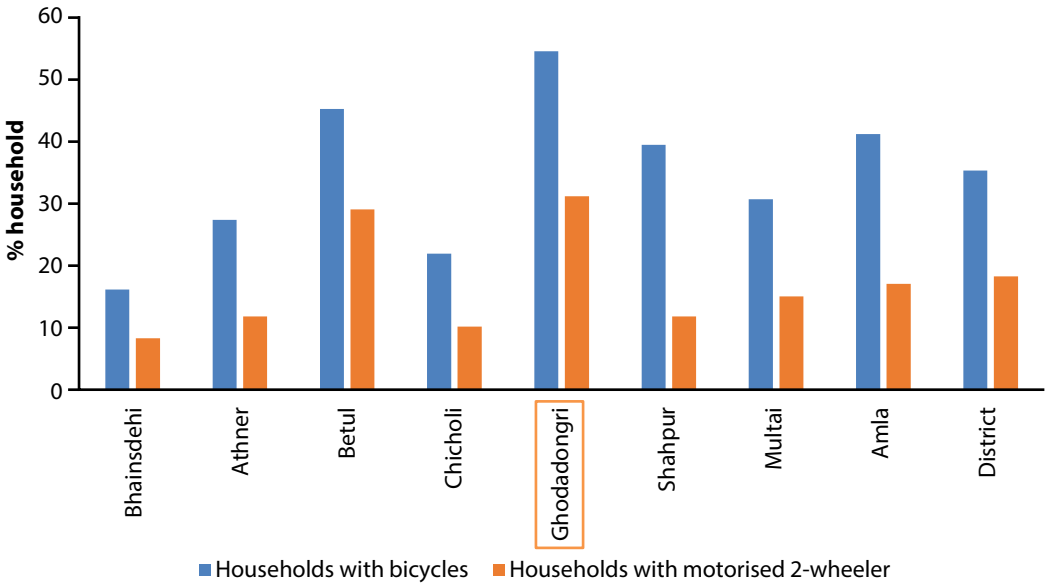
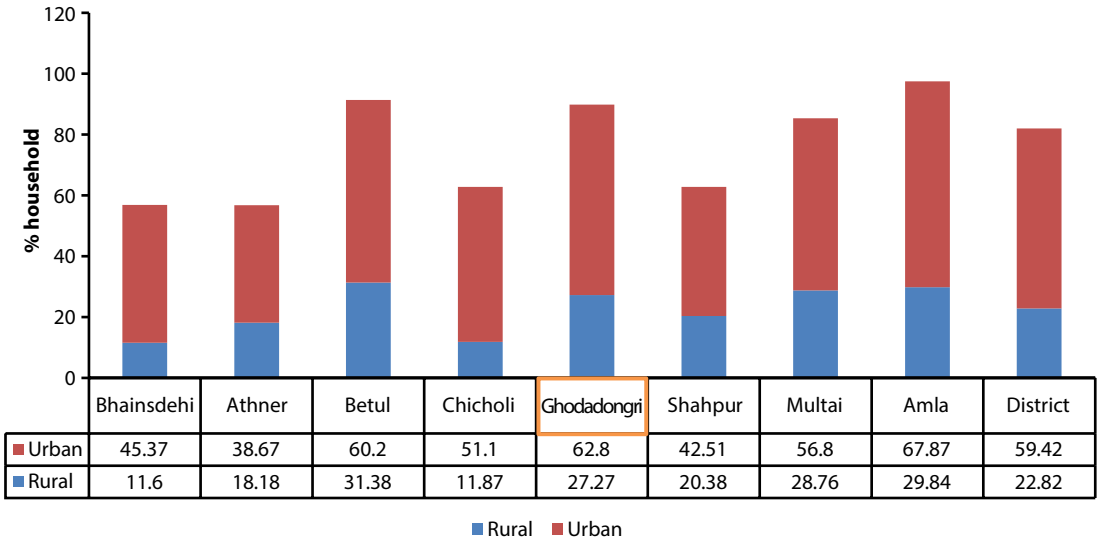



**Figure 37: Tahsil-wise household ownership of two wheelers**

*Source: District Census Handbook, Betul*

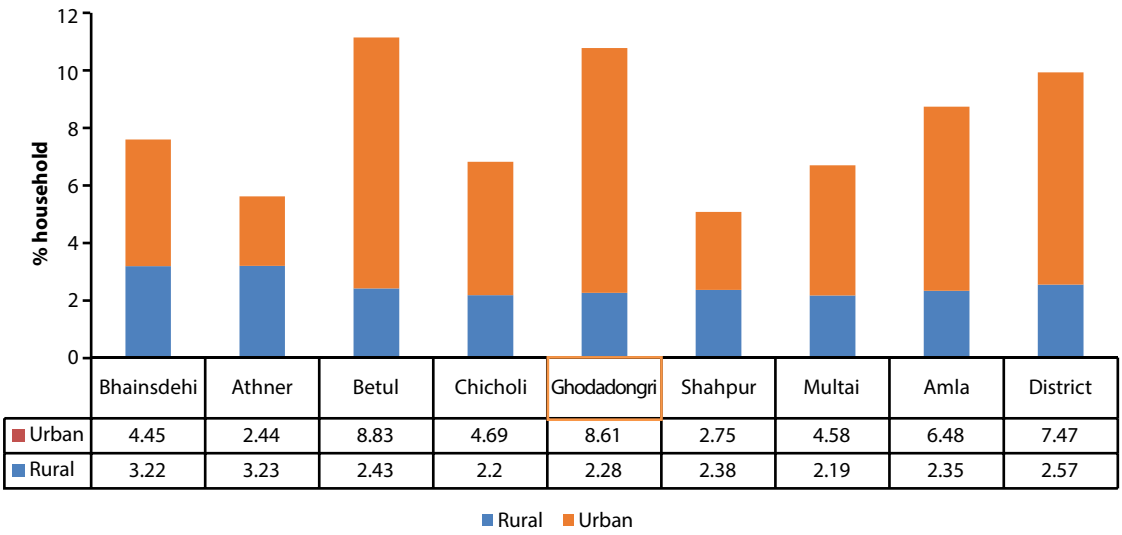





| | Bhainsdehi | Athner | Betul | Chicholi | Ghodadongri | Shahpur | Multai | Amla | District |
|---|---|---|---|---|---|---|---|---|---|
| Urban | 45.37 | 38.67 | 60.2 | 51.1 | 62.8 | 42.51 | 56.8 | 67.87 | 59.42 |
| Rural | 11.6 | 18.18 | 31.38 | 11.87 | 27.27 | 20.38 | 28.76 | 29.84 | 22.82 |

**Figure 38: Tahsil-wise households with mobile phones**

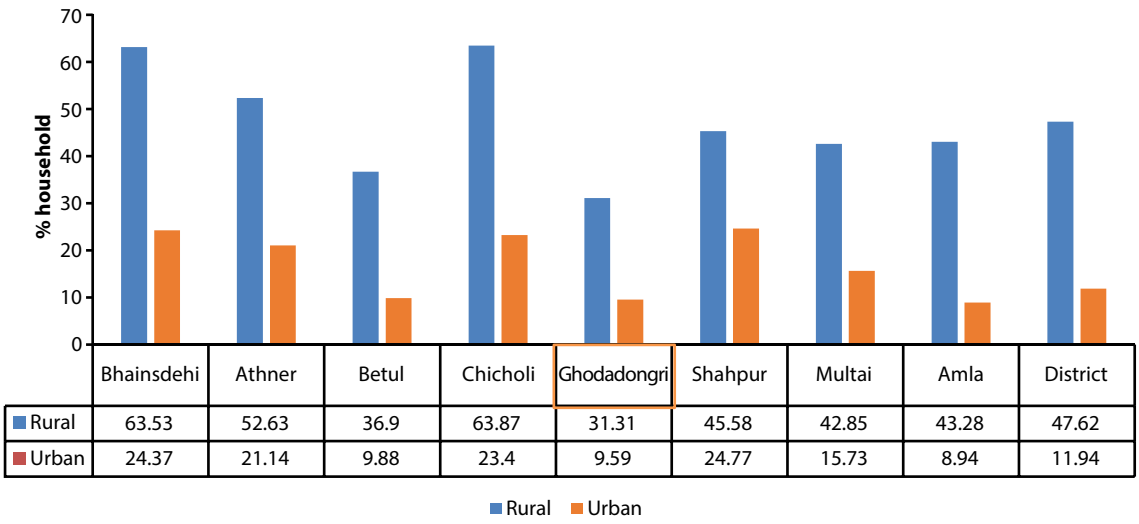
*Source: District Census Handbook, Betul*




| | Bhainsdehi | Athner | Betul | Chicholi | Ghodadongri | Shahpur | Multai | Amla | District |
|---|---|---|---|---|---|---|---|---|---|
| Urban | 4.45 | 2.44 | 8.83 | 4.69 | 8.61 | 2.75 | 4.58 | 6.48 | 7.47 |
| Rural | 3.22 | 3.23 | 2.43 | 2.2 | 2.28 | 2.38 | 2.19 | 2.35 | 2.57 |

**Figure 39: Tahsil-wise households with laptop/computer**

*Source: District Census Handbook, Betul*




| | Bhainsdehi | Athner | Betul | Chicholi | Ghodadongri | Shahpur | Multai | Amla | District |
|---|---|---|---|---|---|---|---|---|---|
| Rural | 63.53 | 52.63 | 36.9 | 63.87 | 31.31 | 45.58 | 42.85 | 43.28 | 47.62 |
| Urban | 24.37 | 21.14 | 9.88 | 23.4 | 9.59 | 24.77 | 15.73 | 8.94 | 11.94 |

**Figure 40: Tahsil-wise households without assets**

*Source: District Census Handbook, Betul*



## 2.8 Coal's Influence on the Workforce Composition and Income Distribution in the Region

While the coal mines and power plant saw an influx of workers, the rest of the district suffered out-migration and exodus. The employment benefits of mining were restricted to the tahsil level and particularly to Sarni. Not only did inequalities between tahsils exacerbated but even within the tahsil, the rural and urban gap widened.

This section covers the inter-tahsil and inter-municipalities variations in employment opportunities

and assesses the income characteristics of the district while attempting to understand the role coal plays in either ameliorating or worsening the living conditions.

### Workforce characteristics at tahsil level

The percentage of main workers outside of agriculture is the highest in Ghodadongri (45.8%) followed by Betul (37.3%), where the energy industry and public administration have absorbed (Figure 41).

### Income source of the urban and the rural

Of the urban households that receive income, 20% in Sarni get monthly incomes, followed by 17% households in Betul and 16% in Amla municipalities (Figure 42).

Whereas, Figure 43 shows a high share of rural households in Ghodadongri, about 60% of them depend on manual casual labour for incomes. Work casualization has gained a footing in the energy industry and opened gates for increased casual labour.

The relatively low percentage of (rural Ghodadongri) households in agriculture at 28% as compared to other tahsils in the district, indicates that agriculture may have suffered due to mining activities.

### Rural employment and income

Figure 44 points out that less than 7% of the rural household in Ghodadongri have any kind of salaried jobs. The energy industry has given less than 1% jobs in its rural vicinity.



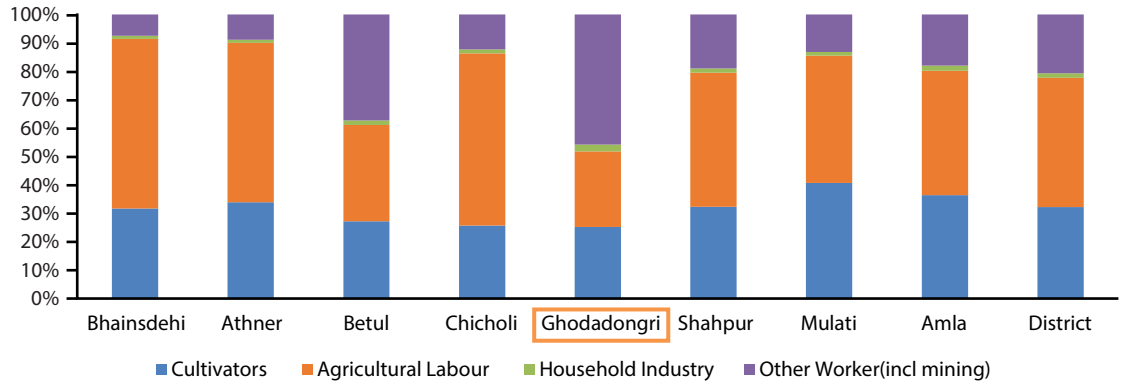



**Figure 41: Tahsil-wise composition of 'main' workers**

*Source: District Census Handbook, Betul*

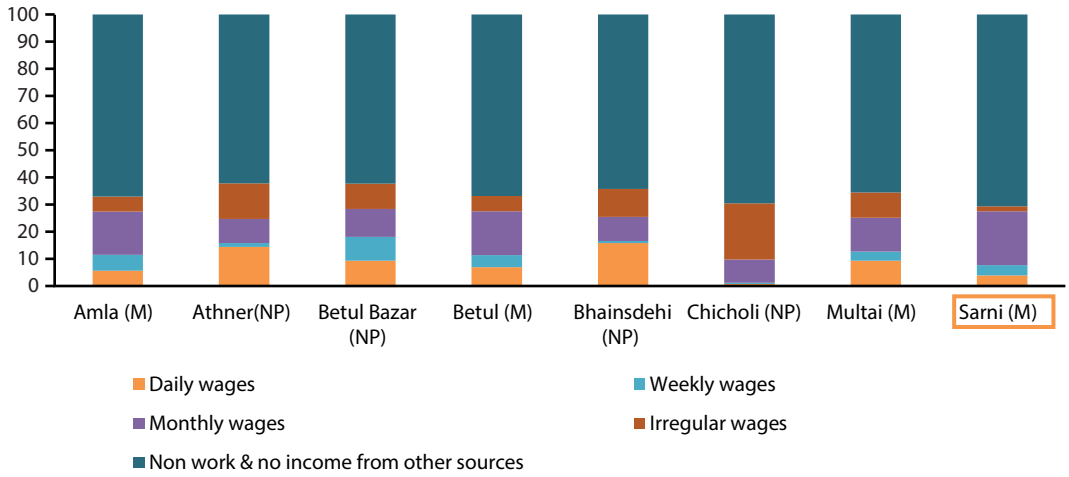



**Figure 42: Modes of income, urban households**

*Source: Socio-Economic and Caste Census, 2011, Ministry of Rural Development*

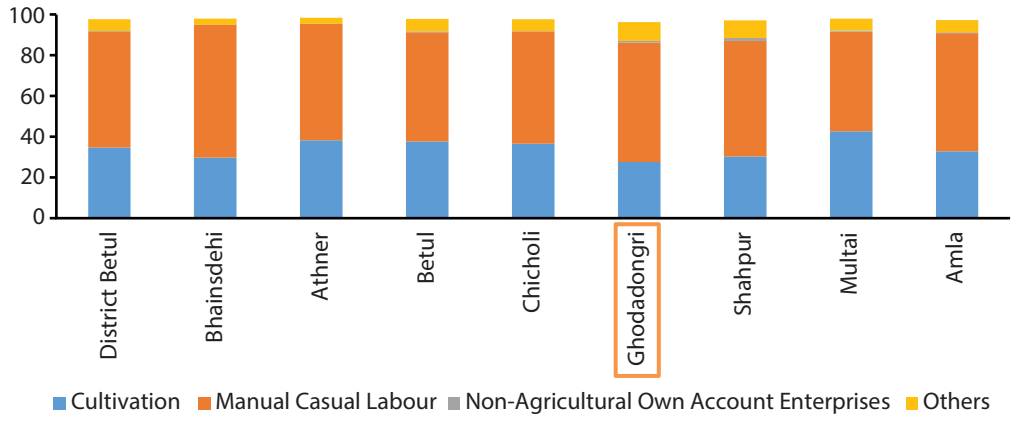



**Figure 43: Modes of income, rural households**

*Source: Socio-Economic and Caste Census, 2011, Ministry of Rural Development*

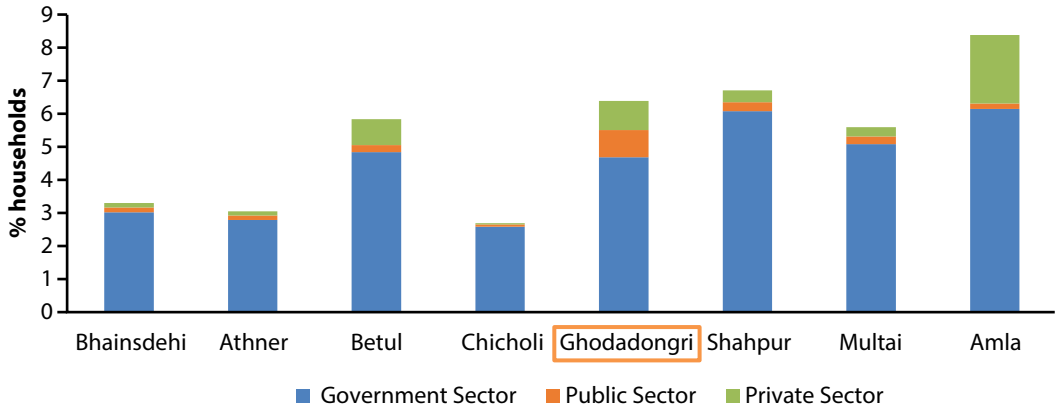



**Figure 44:** Salaried job distribution, rural households

*Source: Socio-Economic and Caste Census, 2011, Ministry of Rural Development*

Figure 45 indicates 90% of the rural households in the district have the highest-earning member earn less than INR 5000 a month. Rural Ghodadongri too has 90% households in the same category.

## 2.9 Discussion

That the energy industry has been the foundation of economic development in the district has been established through this chapter. From prompting the setting up of a whole new governance body, the Sarni Municipality, to building physical infrastructure such as railways, roads, and public utility services, and providing the impetus to businesses and markets to function amongst others, coal continues to be at the centre of Betul's economy.

But the revenue generated from this industry in the form of tax receipts has been shrinking. As more mines are slated to close due to exhaustion of reserves, further declines are expected.

The tilt of resources and infrastructure in favour of the energy industry has been such that enterprises and businesses outside of mining could not exist. The MSME distribution has also been around retail and repair. The local area could only meet the demand for labour, and increasingly casual labour.

Despite the presence of the industry, Betul continues to be impoverished with extreme poverty and inequalities, as evident in the tahsil-wise variations of several economic indicators. Agriculture alone

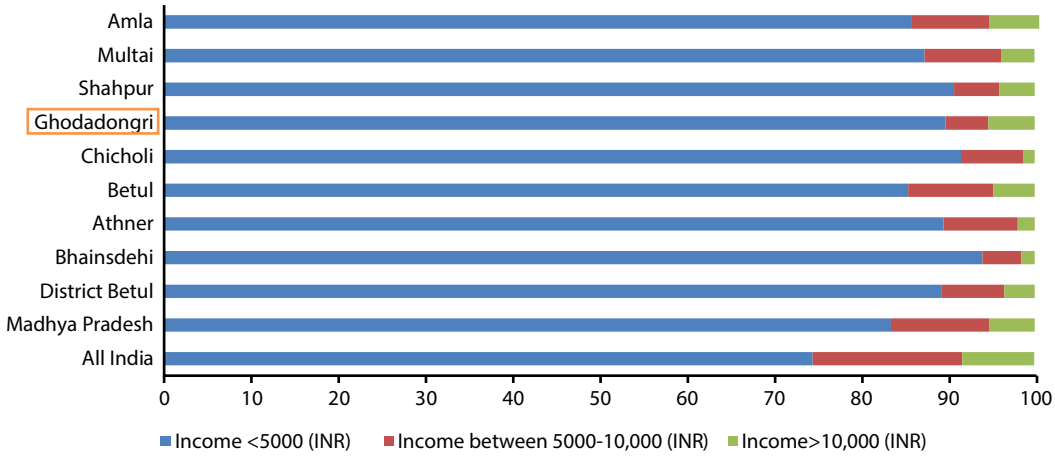



**Figure 45: Monthly income of the highest eaning household member (rural)**

*Source: Socio-Economic and Caste Census, 2011, Ministry of Rural Development*

accounts for 40% of its GDP and absorbs 78% of the 'main' workforce, with an overwhelming share of agricultural labourers. The district's rank in the State on the overall per capita income has seen a sharp fall, particularly after mine closure. About 90% of the rural households have reported less than INR 5000 as the monthly income of the highest wage earner. Employment generation in the industry for the locals has largely been restricted to informal and temporary jobs, some of which boomed during construction of new units of power plant. The district needs jobs, infrastructure (both physical and social), and opportunities to address the glaring inequalities within the working communities.

This chapter has helped develop a nuanced understanding of why some tahsils within the district and particularly areas in vicinity of the energy industry continue to experience poverty even today. Coal proceeds from DMF, MPGATSVA, CSR have immense potential to plug in the gaps.

# 3 Overview of **Employment in the Energy Industry**

## 3.1 Coal Mining

*'We are second only to the defence personnel in the country, as we risk our lives everyday in the dark underground to give light to the world. Our fellow workers who have died in tragic events while at work or those who died of occupational diseases are no less than martyrs'*, as per an office bearer[1] of Bhartiya Koyla Khadan Mazdoor Sangh (BMS affiliated), Pathakhera.

### *3.1.1 Brief Background of the Coal Mine Employment in Pathakhera*

In the early 1960s, when commercial mining operations were resumed in the region, the areas was thickly forested and the transport infrastructure was inadequate. Locals, mostly the indigenous tribes, the Korkus and Gonds, were unwilling to work in the mines primarily for two reasons: they were cultivating their land and agriculture was then rewarding. And, daily commutation to the mines was difficult as connectivity and transportation infrastructure was poor and the fear of wild animals was high.

**Influx of workers in the region**

To meet the workforce requirement, workers from the now Jharkhand–Bihar–Uttar Pradesh belt were brought and offered to settle here. In the 1960s , the first Wage Board for the coal mines was set up that looked into wage fixation, fair and periodic revision of wages, safeguarding workers interest amongst others, and mining started to gain ground. With periodic revision in wages, there came a time when the wages paid to a coal miner were substantially




**Picture 3: Called the Shaheed Stambh (Martyrs Memorial), in memory of those workers who died in an accident in Satpura 1 mine in 1986**

1 Vijinder Singh, General Secretary, BMS

higher than that of agricultural labour, and mining became an attractive industry.

**Recruitment practice**

Officials and union members shared that, to work as a miner, there were no prerequisite educational or technical qualification needed till the last recruitment drive of 1984. Applicants had to undertake a test of physical endurance by lifting a wheel, locally called a *chakka*. Those who could lift the wheel were recruited.

**Picture 4: Ruins of the historic chakka/wheel, Shobhapur Mine**



### *3.1.2 Impact of Mass Recruitment of the Early Years on Mass Retirements Today*

Around the 1970s, the setting up of an Employment Exchange became a necessity as a result of large influx of workers from outside. Nominations for recruitment in the mines were sent by the Exchange. Recruitment drives for coal workers in the region were either held on the first day of July or on the first day of January. Hence, the cut-off date for the minimum age eligibility would be set for a day prior, i.e. June 30th or December 31st. A significant number of the job seekers in the mine at that time did not have the necessary documentary evidence of their birth. However, they got their certificates made locally and such were the dynamics operating that the date of birth registered corresponded to the cut-off dates, i.e. either June 30th or December 31st.

This explains the recent trend of the high number retirements from the coalfield as a large number of people hired in the mid-1970s have reached or are now reaching their retirement age, more so in June and December. The last recruitment drive for the regular mining workforce in the region was held in 1984.

Figures 46 and 47 show the retirement trend at the coalfield and the current age profile of its regular workforce. December 2019, has seen 686 retirements (13% of the workforce in 2019). This is the highest number retired in any single year so far. By 2030, the coalfield would have seen retirement of 46% of the current workforce retire.

(Section 2 on coal's interaction with Betul's economy, had shown the impact that the declining regular

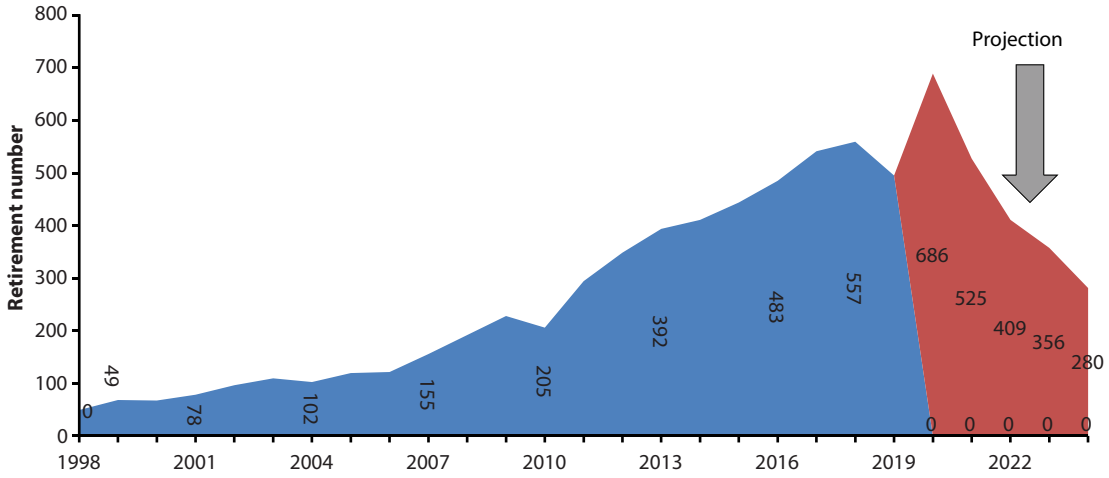



**Figure 46: Retirement trend at Pathakhera Coalfield**

*Source: Office of the Area General Manager, Pathakhera Coalfield*

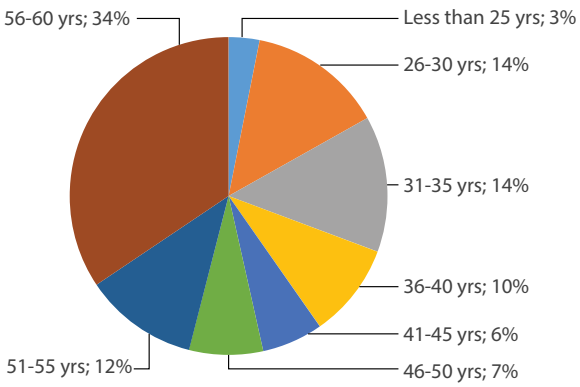



**Figure 47: Age profile of the Pathakhera Coalfield workforce, December 2019**

*Source: Office of the Area General Manager, Pathakhera Coalfield, WCL*

workforce had on the local economy. It is significant to bring this discussion here to emphasise the need and urgency for planning for the region).

## *3.1.3 Drivers to the Shift in Recruitment*

This section looks at some of the drivers to the shifts in recruitment in the coalfield, from recruiting in mass numbers to recruiting only for statutory positions.

### 3.1.3 (a) National Shift from Underground to Opencast Production

The year 1984 saw the last mass recruitment drive in Pathakhera. This coincides with the period in the coal mining history when opencast production began superseding the underground mines. Until then, as mining is a labour-intensive industry, the demand for coal could not have been met without introducing machines and technology. The impact of mechanization and technological advances on mining was such that in 1976 while the share of opencast in the total produce of the country was 27%, it steeply rose to 41% in 1981 and to 56% by 1986. The change in production brought about by mechanization is evident from Figure 48, showing the production trend over 40 years whereby the proportion of underground coal production (referenced from Director General of Mines Safety, hence 'below ground' terminology retained) to the total production has been steadily declining as against the increase from opencast. The decline in underground mine workers also begin to set in between the late 1980s and early 1990s.



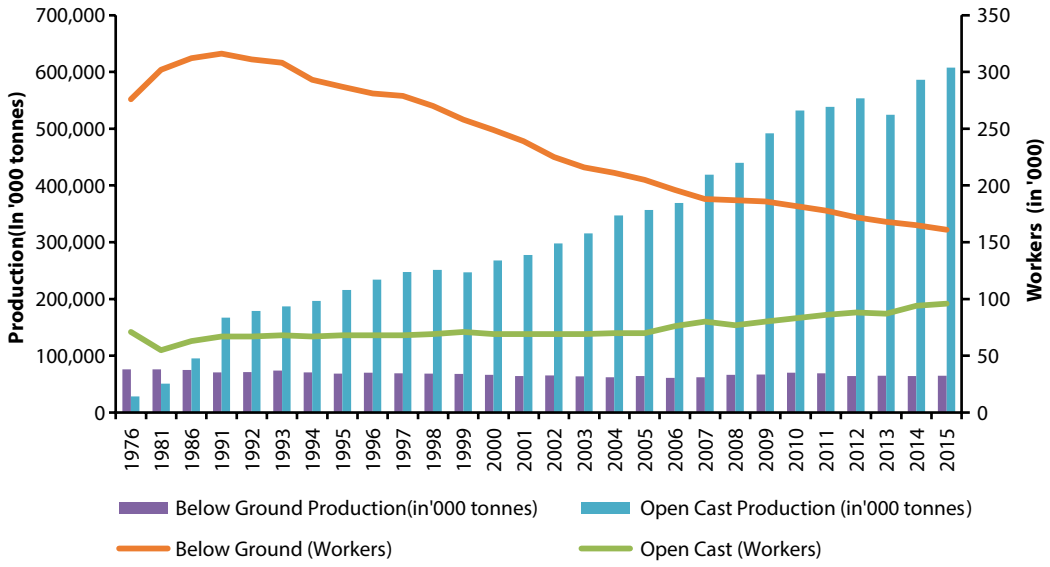



**Figure 48: All India trend of coal production and average daily employment in underground and opencast mining**

*Source: TERI analysis based on Statement 1.1 Trend in Average Daily Employment and Statement 1.6 Trend in Output of Coal from Director General of Mines Safety, Ministry of Labour and Employment, Government of India (DGMS figure covers the coal mines in India coming under the purview of the Mines Act, 1952)*

### 3.1.3 (b) High Production Cost of Underground Mining

Production cost of underground mining was high given the constraints to mechanizations and the high factor cost of wages vis a vis the price of coal. R. Lall in the Report of Central Wage Board[2] for the Coal Mining Industry (Ministry of Labour, Employment and Rehabilitation; Government of India, 1963) identified the following reasons why the potential of mechanization could not be completely realised in underground mines.

- Cost of machineries, including the cost of depreciation, could not be recovered from the rates of production of coal. The quality of Indian coal was lower and the size of the colliery smaller as compared to that of the West where the machines were manufactured. The machineries manufactured were suited to the geographic conditions of the country of manufacture.
- Imported machineries threw open challenges of sorts. These included difficulty in availability of spare parts to increased costs of repairs and maintenance coupled with increasing depreciation.

Besides the limitation to mechanization in underground mines, the report also highlighted the limited capacity of the industry to bear the rise in factor of production primarily due to the price structure of coal. The wage structure was guided by the following considerations:

- Special features of the industry (difficult conditions of work as the industry is largely dictated by natural forces)
- Place and needs of the industry in the economy.
- Prevailing wages in the neighbouring localities (to retain the workers in the industry)
- Safety and health concerns of the workers
- Need to maintain industrial peace and harmony

**The Shift in Pathakhera Coalfield**

From the data made available, Figure 49 shows the recruitment pattern over the last five-year period in the coalfield. Recruitment is now restricted to



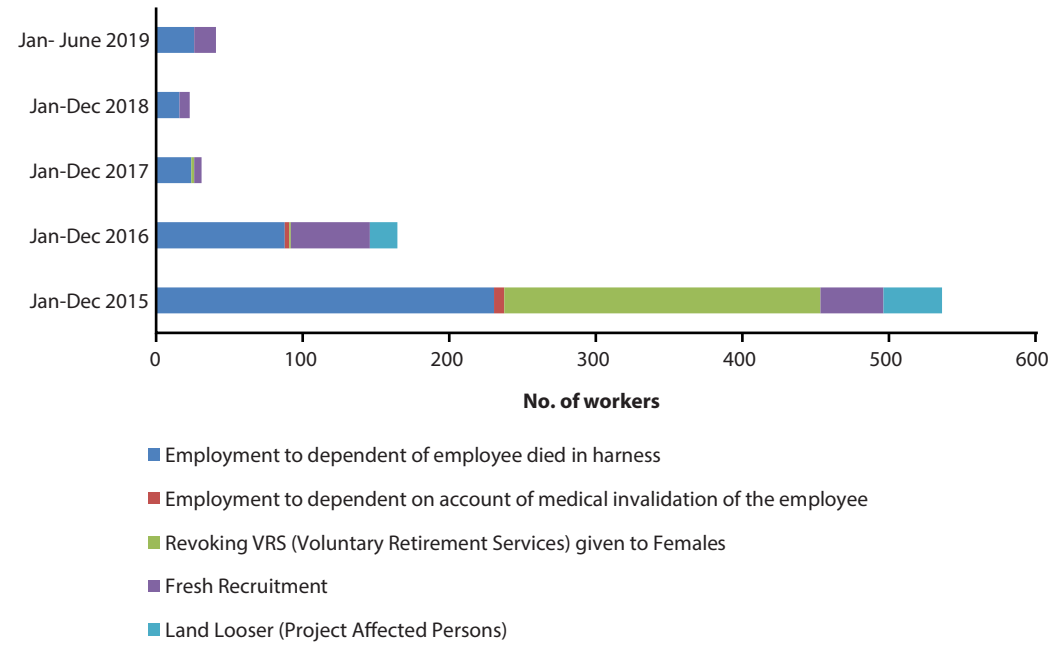



**Figure 49: Recruitment of miners under various categories, 2015–19**

*Source: Office of the Area General Manager, Pathakhera Coalfields, WCL*

2 Ministry of Labour, Employment and Rehabilitation, Government of India, 1963

those given jobs on compassionate grounds, or on statutory positions that requires educational and technical pre-qualifications.

The high number of recruitment on compassionate grounds (employment to dependent of employee who died in harness) in the year 2015 is due to the filling of previous years' backlog. It is also important to note that until February 2019, women were not allowed to work in the underground mines (section 46 of the Mines Act had restricted women from working in underground mines). The VRS revoking for women refers to those women employed in regional workshop and area office.

### *3.1.4 The Declining Regular Workforce*

Figure 50 shows the decline in the regular workforce (also referred to as the 'direct' workforce) in the area from 11,195 workers in 1992 to less than 4500 in 2019. As older mines were exhausted and closed, workers were relocated to newer ones.

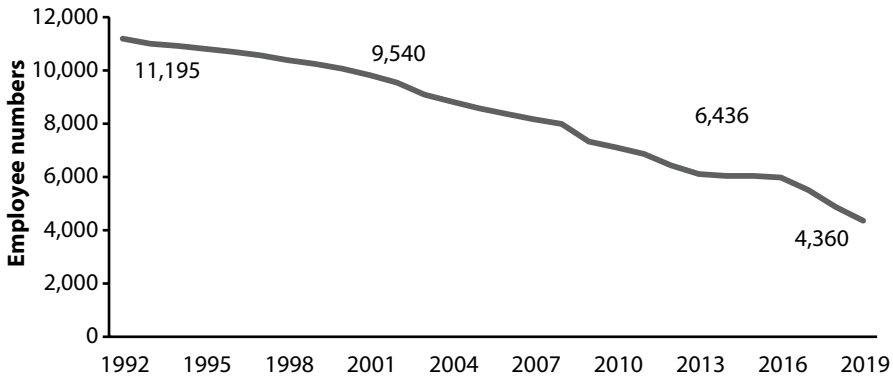



**Figure 50: Declining workforce in the coalfield, 1992–19**

*Source: Office of the Area General Manager, Pathakhera Coalfields, WCL*

A senior official of Pathakhera Coalfield remarked, '*with no new mines opening up the employment situation is getting grim. This place has given the nation doctors, engineers and bureaucrats. Miners have a very distinct affinity with the place and with their jobs. There are examples of three generations working in the mines in the region. Beside a high paying job, they are entitled to good housing, continuous supply of electricity, water and sanitation services and their family accesses good quality education and health infrastructure supported by the PSU.*'

## 3.2 Employment in Satpura Thermal Power Station

The Chief Engineer of STPS shared that, commissioning of automated units, improved energy efficiency and emission reduction norms, will reduce demand for coal in the region, thereby eliminating some of the job roles, especially those that required handling coal. The decommissioned five units of 62.5 MW capacity each, required 5 lakh tonne of coal each year, but a single new unit has now replaced 5 older units bringing down the coal demand. He further shared that four units (units 6, 7, 8 and 9) will be decommissioned by 2021–22. These four units have approximately 1200 regular employees and 2000 contract workers.

**Picture 5: Miners await the man riding system, Shobhapur Mine**

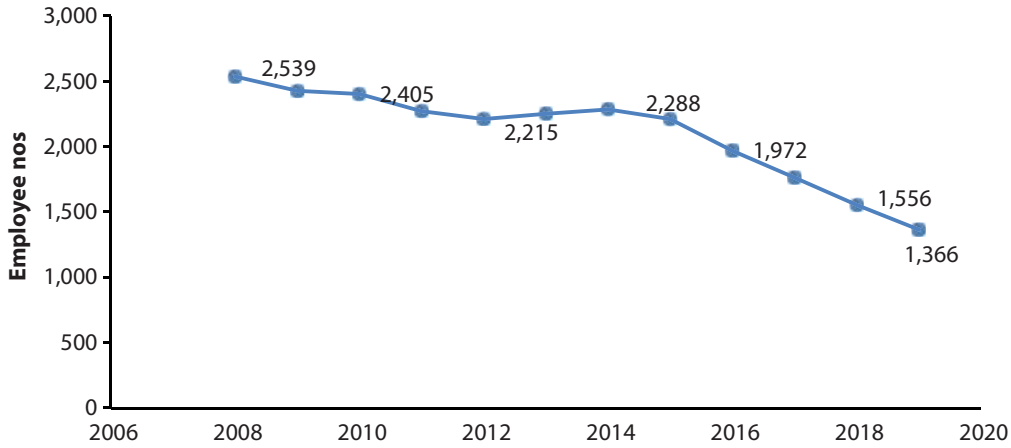



**Figure 51: Declining workforce at STPS**

*Source: Office of the Chief Engineer, STPS*



Figure 51 shows the regular workforce decline by almost 50% in the last decade. Like in Pathakhera coalfield, the workforce at STPS declined due to natural retirement and no new recruitment to the regular workforce (Figure 52). In the years 2013 and 2014, there was a transfer of employees to Singhaji Power Plant at Khandwa.

## 3.3 The Social Composition of the Workforce

For any discussion on transition, be it a low carbon or an Industry 4.0 transition, the existing composition of the industry is important to understand. It brings to fore issues such as who the workers are (their social and educational status, formal or informal workers), the nature of jobs they are engaged in, their ability or inability to transit to the new amongst others.

Figure 53 summarises that about 20% of the workforce in STPS and 7% workforce in the coalfield form the high and mid- management whereas the bulk of workers in both mining and power plant are in the C and D/ III and IV category or the non-executive group.

The energy industry provided formal employment and associated social benefits even if the jobs required low skills (though fraught with risks too). The affirmative action policy in providing reservations in government jobs to the socio-economically weaker sections has had its own implications. Caste

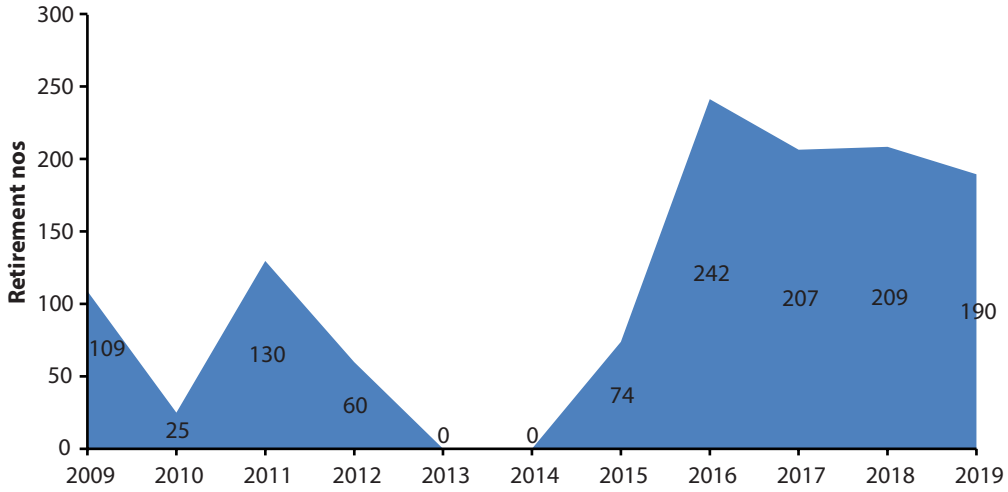



**Figure 52: Retirement at STPS, 2009–19**

*Source: Office of the Chief Engineer, STPS*

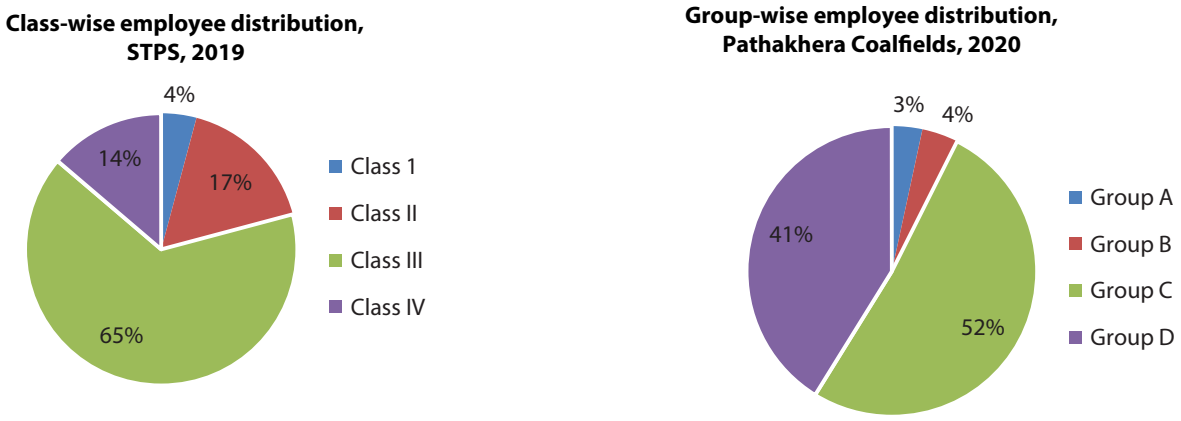



**Figure 53: Employee distribution across various grades in the energy industry**

*Source: TERI analysis based on data obtained from Pathakhera Coalfield and Satpura Thermal Power Station*

identities have a strong influence on the social composition of the industrial workforce.[3]

A brief discussion of these categories are as-

- Scheduled Castes (SCs)- identified on the basis of their historic connection with untouchability.
- Scheduled Tribes (STs)- distinguished by their tribal culture and physical isolation
- Other Backward Classes (OBCs)- a heterogeneous category varying from state to state comprised for the most part of castes low in the traditional social hierarchy, but higher than SCs[4].

Sarni municipal body has 36 wards, of which the coalfield occupies 22 and the power plant occupies 13, leaving only 1 ward outside the industry. The social demography of the place, with high concentration of SCs in some of the wards, indicates the social composition of the industry (Figure 54).

3 Lahiri-Dutt, Kuntala, 2006. Kamins Building the Empire: Class, Caste, and Gender Interface in Indian Collieries. 10.1007/978-1-349-73399-6_5. Details available at https://www.researchgate.net/publication/314669387_Kamins_Building_the_Empire_Class_Caste_and_Gender_Interface_in_Indian_Collieries/citation/download

4 The description for each of the social group has been taken from Galanter, Marc.1979.Compensatory Discrimination in Political Representation: APreliminary Assessment of India's Thirty-Year Experience with Reserved Seats in Legislatures. *Economic and Political Weekly*, Feb, Vol 14, No 7/8

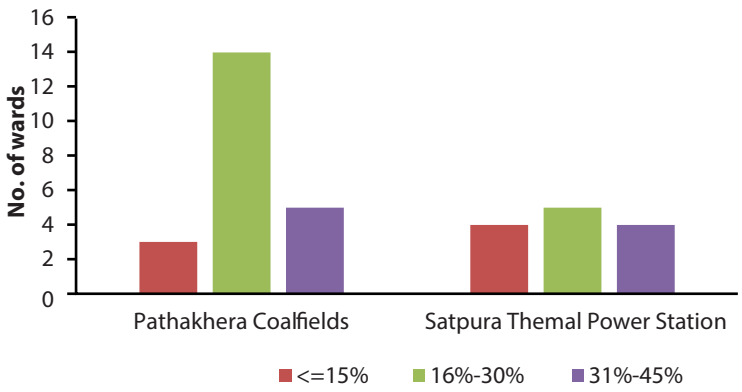



**Figure 54: Scheduled castes composition across the industry wards**

*Source: TERI analysis based on data obtained from office of the Municipal Commissioner, Sarni Municipal Council*

## 3.4 The Reservation Policy and Its Implication

(Based on the available data, this section looks at employment reservations in mining alone)

Employment reservation in government and public sectors is an affirmative action by the State to enable the socially excluded gain access to formal employment. Coal India Limited (CIL) follows the Central Government's reservation quota for Groups A and B and the State Government's reservation quota for Groups C and D[5]. Table 4 and Figure 55 summarises the percentage seats reserved for each of the three social categories.



and B. Reserved seats in Groups A and B (by written test) for SCs is 15%, STs is 7.5% and for OBCs is 27%. The required mandate has not been met. In Group A the filled-in seats were: SCs (10%), STs(3.6%), OBCs (10.9%) and Group B it is SCs (11.1%), STs (6.5%), OBCs (13.9%) .

Group C and D account for 90% of the overall regular employment and the majority of SCs, STs, and OBCs employees are in these groups. The subsidiaries of CIL follow the reservation mandate of the state they operate in. It is pertinent to mention that even nationally, the category of safai karamchari/sweeper is predominantly held by the SCs at 97%.

**Table 4: Directives for reservation in recruitment and promotion**

| | SCs | STs | OBCs |
|---|---|---|---|
| Reservation at the Centre for direct recruitment by written competitive test in Groups A and B | 15% | 7.5% | 27% |
| Reservation at the Centre for direct recruitment without written competitive test in Groups A and B | 16.7% | 7.5% | Rest limited to 50 |
| Reservation in the State for Groups C and D | 16% | 20% | 14% |

*Source: Annual Report 2013-14, Ministry of Coal accessed from https://coal.nic.in/content/annual-report-2013-14*

**At the CIL level**

CIL at the national level has not been able to fill the seats as per the mandated reservations in Groups A

A Parliamentary Committee on the Welfare of Scheduled Castes and Scheduled Tribes presented its second report on Ministry of Coal in September 2020. In its subsection B (ix), part II of Chapter 1, it mentions 'that the shortfall in promotion in different grades, if any, is caused due to non-availability of

5 Ministry of Coal. 2013-14, Annual Report

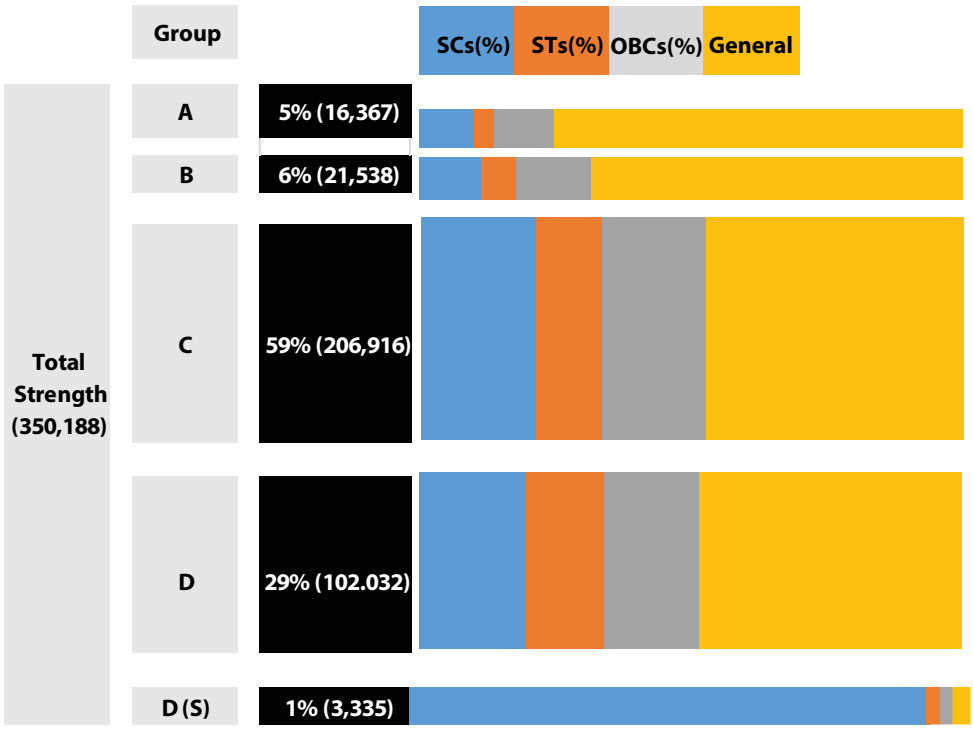



**Figure 55: SCs, STs and OBCs representation in Coal India Limited, 2013–14**

*Source: TERI analysis based on Annual Report 2013-14, Ministry of Coal details available at https://coal.nic.in/content/annual-report-2013-14*



sufficient number of SC/ST candidates in the zone of consideration in feeder cadre/below grade'.

**At Pathakhera Coalfield**

At the regional level, there is an encouraging representation of SCs and OBCs in Groups A and B. With reservation in place, a sizeable section of SCs and OBCs were able to utilize the opportunity of formal industrial employment and confer advantages on their children. The next generation then pursued technical and higher education and could meet their aspirations. However, the participation of STs has been quite low.

With a reservation mandate for SCs, STs, and OBCs in Groups C and D at 16%, 20% and 14% in the state, the OBCs have an overwhelming participation in the coalfield under these two groups (Table 5).

Ghodadongri tahsil largely constituted of STs, the STs have been the Project Affected Persons and offered jobs in Groups C and D.

**Table 5: Representation of SCs, STs, and OBCs in Pathakhera Coalfield, 2020**

| Group | Total employees | SCs (%) | STs (%) | OBCs (%) |
|---|---|---|---|---|
| A | 151 | 17.22 | 3.31 | 19.21 |
| B | 179 | 15.08 | 4.47 | 26.26 |
| C | 2295 | 13.25 | 7.49 | 30.54 |
| D (excluding sweeper) | 1804 | 9.76 | 7.15 | 25.06 |
| D (sweeper) | 32 | 100 | 0 | 0 |
| Total | 4461 | 12.67 | 7.04 | 27.55 |

*Source: Office of the Area General Manager, Pathakhera Coalfields*

Similar to the trends shown at the national level, Pathakhera Coalfield also shows that the jobs at the bottom most, i.e., of the sweepers, are filled in only by dalits (scheduled castes), suggesting thereby the continued embeddedness of the caste system.

There is no coincidence that some of those intergenerational workers in coal mining also belong to these social groups as their fathers and forefathers have worked in Groups C and D. The bulk of new entrants through the 'employment to dependents of employees who died in harness', also reflects the risks and hazards that workers are exposed to, despite the occupational health and safety measures taken by the Coalfield.

Transition framework needs to factor in the bulk of the workers at the lower levels who are engaged in manual work with limited upward mobility in employment and carry the burden of being socially disadvantaged.

## 3.5 The Industry Defined Socio-political Milieu

**A reserved scheduled castes constituency**

Pathakhera and Sarni fall under the Amla[6] Constituency, a scheduled castes reserved assembly constituency after the delimitation exercise of 2008 by the Election Commission (Table 6). It will continue to remain so until the next review due in 2031. A reserved constituency implies that the candidate who contests from here must also belong to the specified group. The nature of this constituency has important political bearing. The concerns of the politician and demand from the constituency is around promoting coal and thermal power generation and jobs around them.

**Table 6: Assembly constituencies in Betul**

| Constituency | Type |
|---|---|
| Amla | Scheduled Caste |
| Betul | General |
| Bhainsdehi | Scheduled Tribe |
| Ghodadongri | Scheduled Tribe |
| Multai | General |

*Source: Website of the Chief Electoral Officer, Madhya Pradesh, Details available at https://ceomadhyapradesh.nic.in/ASSEMBLYELECTION.aspx*

6 Details available at https://ceomadhyapradesh.nic.in/BLO_Detail_2019.aspx

Figure 56 shows the town-wise percentage of SCs in the district, with Sarni holding the highest percentage at 25% (total SCs population of 21,532), followed by Amla at 23.5% (total SCs population of 7116). Concentration in Sarni can clearly be attributed to the nature of the industry.

## 3.6 Emergence of Informality

The energy industry is witnessing a net decline of the regular workforce. Some of the reasons as cited above are closing of mines, no new mines opening, power plant meeting its coal requirement from outside regions, and commissioning of energy-efficient power houses amongst others.

The number of contract workers in the power plant in 2019 stood at 1479, surpassing the total regular employees at 1366. Similarly, outsourcing work to private contractors for mining has gained significance in the coal economy. This analysis of increase in informal/contract workers has been arrived from the data available on the daily average employment[7] in coal mines from the Office of the District Planning Officer. This understanding has also been complemented by the various interactions with workers, contractors, and officials of the coalfield.

With the closure of Pathakhera I, Pathakhera II and Satpura II mines, the average daily employment in the mines came down between 2010 and 2013, but it gained momentum after 2013. This period of momentum can be explained by the sharp increase of contract workers in mines despite a high number of regular workers (retirement of 500 workers) retiring in that year (Figure 57).

Interactions with contractors reveal that theirs is a new force in the region and their numbers will increase so long as the industry continues, and retirements take place. This is substantiated by a comment from a senior official, 'despite retirements, the total number

7 The Directorate General of Mines Safety specifies that the average daily employment covers all persons employed in mines under the Mines Act, 1952 whether employed permanently or on temporary basis, direct or through contractors, and includes clerical and supervisory staff. Senior Supervisory Officials such as Agents, Managers, Under Managers, Engineers, Doctors are excluded in calculating figures for average daily employment.

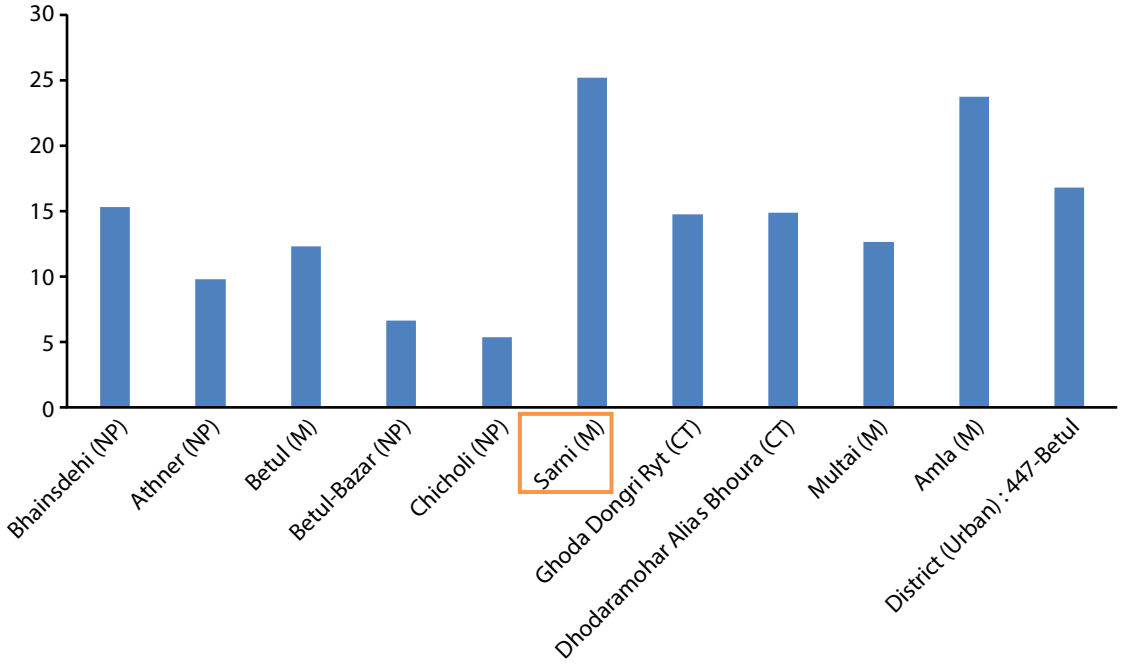
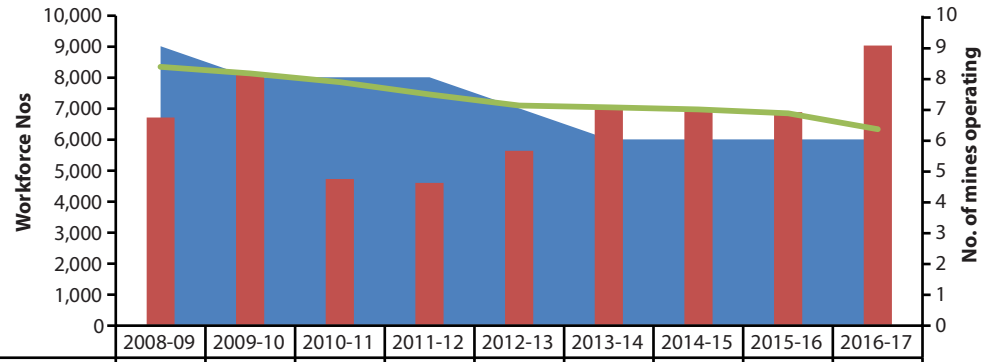



**Figure 56: Distribution of Scheduled Castes across urban towns, Betul**

*Source: Part -A, District Census Handbook, 2011 Betul*




| | 2008-09 | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 | 2014-15 | 2015-16 | 2016-17 |
|---|---|---|---|---|---|---|---|---|---|
| No. of Mines | 9 | 8 | 8 | 8 | 7 | 6 | 6 | 6 | 6 |
| Daily Average Workers | 6700 | 8119 | 4723 | 4603 | 5628 | 7037 | 6968 | 6877 | 9025 |
| Workforce | 8340 | 8119 | 7841 | 7448 | 7087 | 7037 | 6968 | 6836 | 6323 |

**Figure 57: Trend of average daily employment in mines and regular workforce, Pathakhera Coalfield**

*Source: TERI analysis, based on information from Office of District Planning Officer and the Office of the Area General Manager, Pathakhera Coalfield*

of workers in the region has not reduced but has only changed forms. Contract workers have filled in thereby damaging the employment scenario.'

Small contracts are bagged by local contractors. A local contractor is one who shares good rapport with the community, has easy entry into the community, and understands the socio-economic dynamics and distress of the place. With increasing volume of contract arrangements, this business has become intensely competitive. A contractor takes up any kind of work, be it civil or mining, so long as there is work all year round.

Contracting is not a new phenomenon, but its implications need to be understood. While it addressed the economic challenge of bringing down the cost and meet the industry's revenue and production target, it also brought with it practices that increased differentiation, inequality, and marginalization of the growing number of contract workers. Unions have said that it is the more difficult jobs in the mines that get contracted out.

**Drivers to the shift in labour relations**

Officials of the Coalfield have put forth the argument that the periodic rise in wages of the workers (attributed to the National Coal Wage Agreements, signed every 5 years since 1974) has not been proportionate to the rise in coal price. A Joint Bipartite Committee[8] for the Coal Industry (JBCCI) of Coal India and Central Trade Unions periodically revise wages for coal workers. The years 2012 and 2018 saw a significant hike in labour incomes because of the IX and X National Coal Wage Agreements.

Even when productivity increased,[9] the production cost did not render it profitable to arrest the dip in profits owing to higher earnings per manshift. As it was not formulated by Coal India Limited, workers were neither laid off nor was voluntary retirement designed for them. As a member *Bharatiya Koyala Khadan Mazdoor Sangh* (affiliate of the Central Trade Union *Bharatiya Mazdoor Sangh*) remarked, 'the philosophy behind setting of Public Sector Undertakings (PSUs) was to establish a social base and create economic infrastructure for the country, they were not guided by profit making, hence laying off workers or making them redundant was not a step towards cost control.'

Adjustments in labour relations were sought and contract work solved more than one concern of meeting productivity, production and profits of the industry, besides meeting the gap caused due to retirements. As the production targets were met, there was not a need for the PSU to incur cost of permanent employees, except in the case of statutory positions. According to some in the Pathakhera Coalfield, contracting out work is also is a solution to absenteeism and an aging workforce. The average actual absenteeism of the two mines (Tawa UG and Tawa II UG mine) is 35%.[10]

## 3.7 Formal Provisions for the Informal Workers and their Governance

A High-Power Committee (HPC) recommends wages[11] for the contract workers in coal mining and a Joint Committee of Coal India approves it. The last revision, as part of the X Wage Agreement in 2018, laid down, as given in Table 7, for the contract workers besides the provisions of provident fund and underground allowance:

**Table 7: Wages of contract workers under Xth Wage Agreement**

| Category of worker (Contract) | Basic rate of wages (in INR) per day w.e.f. 04.09.2018 |
|---|---|
| Unskilled | 787 |
| Semi-skilled/ Unskilled supervisor | 817 |
| Skilled | 847 |
| Highly skilled | 877 |

*Source: Office Memorandum dated 29/08/2018, No. Fo202/1/2017 Coord, Ministry of Coal, Govt of India*

The industry insists on fair treatment of the contract workers. While awarding the work contract, the

8 For more details on wage and entitlements refer to Memorandum of Agreement, National Coal Wage Agreement, Joint Bipartite Committee for the Coal Industry at https://www.coalindia.in/DesktopModules/DocumentList/documents/NCWA_-_V.pdf

9 It was only in 2003 that the Output per Man Shift (OMS at the level of the country reached 1, in underground mines. In 2009–10, coal production from under ground mines was 43.55 million tonne and that from open cast was 90% of the total production at 388.01 million tonne. The OMS in 2009–10 in under ground was 0.78 and in open cast was 9.51. Subsidiary wise, SECL recorded the highest OMS in open cast mines at 1.33, WCL at 1.12, and CCL the lowest at 0.35. In open cast, the highest OMS was recorded in SECL and MCL at 18.89 and WCL being the lowest at 4.12.

10 Project Report for Tawa III UG Mine, May 2010 of CMPDI

11 Contract workers in mining activities are paid wages as per recommendations of High Power Committee. The wages paid is the midway between the minimum wage notified by the Central Government as per Minimum Wages Act of 1948, for workers employed in scheduled employment in non-coal mines and the wages payable to the lowest category of permanent workers, i.e. Category 1 of NCWA –Ix (Basic + DA+ Spl Duty Allowance + Attendance Bonus) as on 1November 2012 and is more than the minimum wages notified by Central Government as per Minimum wage Act of 1948. Source: Office Memorandum dated 29/08/2018, No. Fo202/1/2017 Coord, Govt of India, Ministry of Coal

Coalfield specifies (i) workers' wages will be based on the declared HPC wage, (ii) wage payment will be made through CLIP (Contract Labour Information Portal) into the workers' bank account, and (iii) provident fund will be deposited with the CMPF (Coal Mines Provident Fund). The compliances of the above contract clauses rest with the contractor. Contractors/subcontractors have direct control over the worker. Stakeholders (including unions, officials of the coalfields, workers both formal and informal) unanimously shared that the contractor takes back the payment in cash from the worker, leaving them with a daily wage ranging between INR 280and 350 for each day of work. Penalization becomes difficult as the papers and records are ostensibly in place.

Interaction with contract workers suggests that workers were in the know of the deductions being made for their provident fund, but neither do they have details of their provident fund account nor know where the deducted money gets deposited. Unions voiced that this will be one of the biggest challenges before Pathakhera, with both formal and informal workers. Although the Coalfield deducts provident fund amount from the contractor and submits the deduction details to CMPF, the contractor does not provide the deposit details. In the absence of the details of contributory deposit, the CMPF may not be able to pay, as it mandates details of both deductions and deposits.

For every periodic revision of wage of the contract worker by the HPC, the value of contracts is also upwardly revised. But the benefits of any such increase are not shared with the worker, as it gets absorbed by the contractors themselves. The only time a contractor bears a loss, as shared, is when input costs escalate during the term of a short duration contract or when penalty is imposed by the subsidiary on non-completion of the work as per the agreed timelines or not meeting the stipulated rate of progress. The pressure to meet the target output on time ultimately falls on the contract worker. They are given daily targets to achieve in the 8-hour shift and paid on a piece-rate basis (a daily average per worker is obtained from the total daily output and wages paid accordingly).

### *3.7.1 Disparity in Entitlements and Working Conditions*

**Inequality in earnings**

Contract workers expressed that even though they work twice as much as a regular worker to achieve the set daily target, there exists huge disparity between their earning and that of the regular workers. The actual daily wage that an informal worker receives is one-third of that of even the lowest category of employee who is paid INR 1130.54 per day (based on the last revised wage in 2018). As the piece rate wage guides the payment of contractor worker, it exacerbates the gap in earnings. A worker exemplified the difference in productivity by citing, 'three permanent workers drill 5 holes a day whereas three contract labour will drill 30 holes a day.'

**Disparity in safety provisions**

Safety equipment are provided by the industry to its regular workers, whereas the responsibility for providing the same to contract workers is delegated to the contractor. However, the informal worker is expected to carry his own shoes and helmet to work. Cap light is provided to them and on some occasions a reflector jacket (usually when there are visitors).

**Non-stability/non-security of job**

There is no provision for upward mobility of a contract worker from an unskilled to semi-skilled or skilled category. They continue in the unskilled category, get poorly paid regardless of the number of years they have worked in the mines. This becomes evident from the number of times a contract worker would have undergone refresher training at the Vocational Training Centre (VTC) of the Coalfield. A preliminary requirement to work in underground mines even on contract is to undergo training at the VTC and refresher course every 5 years. Instances of contract workers having undergone 4 refresher trainings continuing to work in the unskilled category are not uncommon. These workers, however, do not get regularized and oscillate between being hired as unskilled worker or being unemployed.

**Non-payment of stipend/wages during training**

Provisions mandate that the contractors pay stipend to the workers during their training at the VTC. The 50-days

training duration is offered free of cost by the VTC, with 20 days of course work at VTC and 28 days of work with regular workers in the mines. However, the workers have shared that the stipend is almost never paid.

A medical test conducted by the pre-medical examination (PME) team is mandated for every worker once in 5 years for those below 40 years of age and once in 3 years for those above. It is primarily the contractor's responsibility, but the costs are borne by the workers. This practice violates the statutory provision that requires the contractor to bear the cost of PME.

**Denial to representation**

Contract workers fear joining a union and do not participate in any meeting organized by the unions at the workplace. Given the lack of alternate employment opportunities, they fear any kind of dissent. During strikes, they are asked not to report to work and subsequently not paid either.

### *3.7.2 Missing Social Context of Decent Work for the Contract Worker*

A regular employee has provision for children's education in the school jointly run by the Coalfield and Power Plant. The hospital run by the Coalfield is accessible only to the employees and their dependents. The contract worker has no such entitlement.

An office bearer of the Koyla Shramik Sabha remarked that with the meagre wages, the contract worker is barely able to meet the basic needs of his family, let alone the educational need of his children. In the case of his death at work, there is only a provision for monetary compensation but no job for his dependents, unlike for the regular worker. Indebtedness amongst people has started to take roots pushing them to extreme poverty. The experience of mine workers over the years in the place reflects the various transitions that have occurred in the economy.

### *3.7.3 Implications of Informality on the Economy*

Underground regular workers are one of the highest paid workers in coal mining, with high incomes and social security. Their purchasing power fuels the local economy, generating demand, giving rise to a varied nature of induced services and enterprises. Replacing regular jobs with contract jobs gave way to problems of unemployment and under employment. As the local market shrunk with fall in demand, employment generated locally diminished as they were earlier a result of the spinoff of the purchasing power of the regular employees.

More workers are entering the contract workforce because of lack of alternatives and halting of regular recruitment in mining. It implies that more workers are entering into vulnerable jobs, which are insecure and unsafe, with limited or almost no upward mobility in skills and limited access to legal remedy.

As a senior official mention, the time is not far when the contractor workers will turn rebellious. For the same work while a regular worker gets paid INR 3000, a contract worker is paid INR 300. Since they are not organized now, tensions borne out of discrimination get diffused. Trade unions are trying to bring this issue of contract workers into their fold.

## 3.8 The Labour Market Around Coal

Coal mines are in rural areas, where agriculture continues to be the mainstay. Wages in the mines were always higher, even if marginally so, than that paid in agriculture or any other employment programme run by the government. Returns from agriculture are marginal and extreme weather instances, like the extended rains of 2018 which destroyed the entire maize crops, are more frequent. Arable land has shrunk, and land holdings are fragmented.

Workers in the coal mines are both first-generational workers and those with a history of mining in the family. The first-generational workers have been offered jobs as part of the relief and rehabilitation package of the industry, whereas those in contractual work prefer working in mines in their native area rather than migrating elsewhere. The second-generation workers express that they had never thought of any alternative employment nor had acquired alternative skills to find decent employment in cities. Some of them, children of former regular workers, took to contract work, in the hope that newer mines will open in the future and they will become regularized workers.

**The new entrants**

More youth are joining the VTC run by the industry to be trained to work in underground mines, with a hope that opportunities for regular employment will be created when new mines open. Figure 58 shows the social composition of those undergoing a first-time training and refresher course at VTC.

The percentage increase in the scheduled tribe is striking. However, after having lost opportunities in farm and forest- based livelihoods taking up contract work is the only recourse for them.

The VTC rolled out courses on welding, machine repairing, stitching, amongst others but as the officials mention, the economic decline in the region has shrunk opportunities for trained students in both jobs and entrepreneurial development.

**Education**

The industry had set up schools primarily for the children of its regular employees. Despite this, it has had little impact on the illiteracy rates in Sarni, which is at 21.61% (Figure 59), among the highest in the district. Asymmetry in illiteracy is seen not only across urban areas but also in rural, wherein Ghodadongri

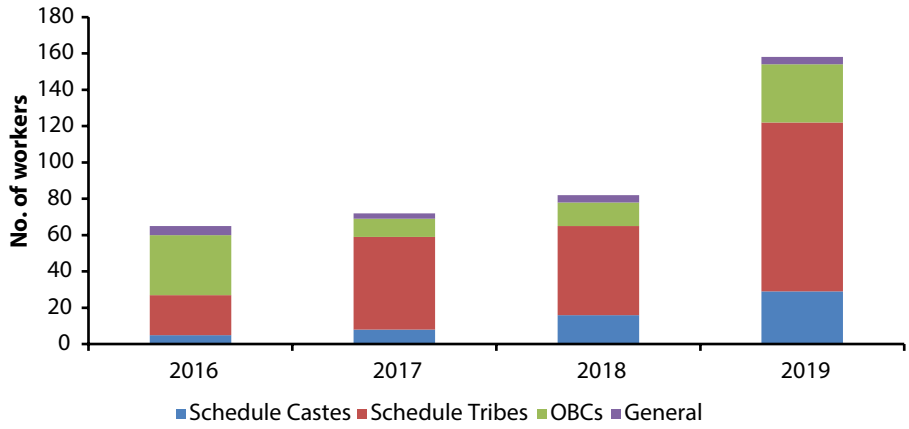



**Figure 58: Social composition of workers undergoing training at VTC, Pathakhera**

*Source: Office of the Area Genaral Manager, Pathakhera Coalfield*

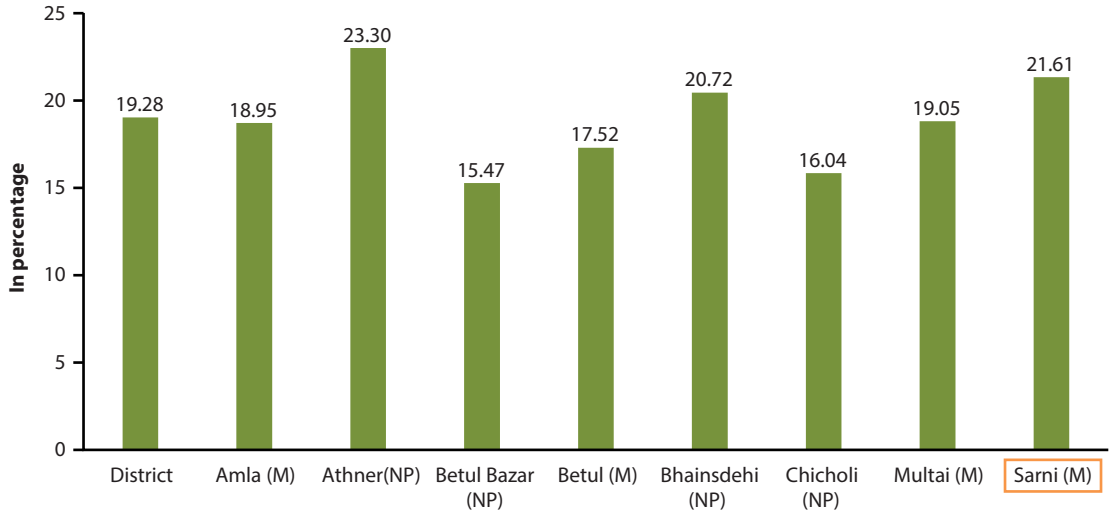



**Figure 59: Urban illiteracy rate, Betul**

*Source: Socio Economic and Caste Census 2011, Ministry of Rural Development*

is also one of the poor performers (Figure 60). The nature of mining is such that it has a workforce base with low literacy levels.

Even amongst the literates, there is a declining percentage in completion of higher education levels. This indicates the barriers to enter the labour market for decent and productive employment. The entry level for vocational training for most of the skilled jobs is usually set at secondary levels. Figure 61 shows less than 10% of the literates are able to complete secondary levels in the rural.

**Co-existence of formal, informal employment, and out migration**

The region has experienced extreme socio-economic inequality. While in the past there was an influx of workers to seek work in the mines (those who came

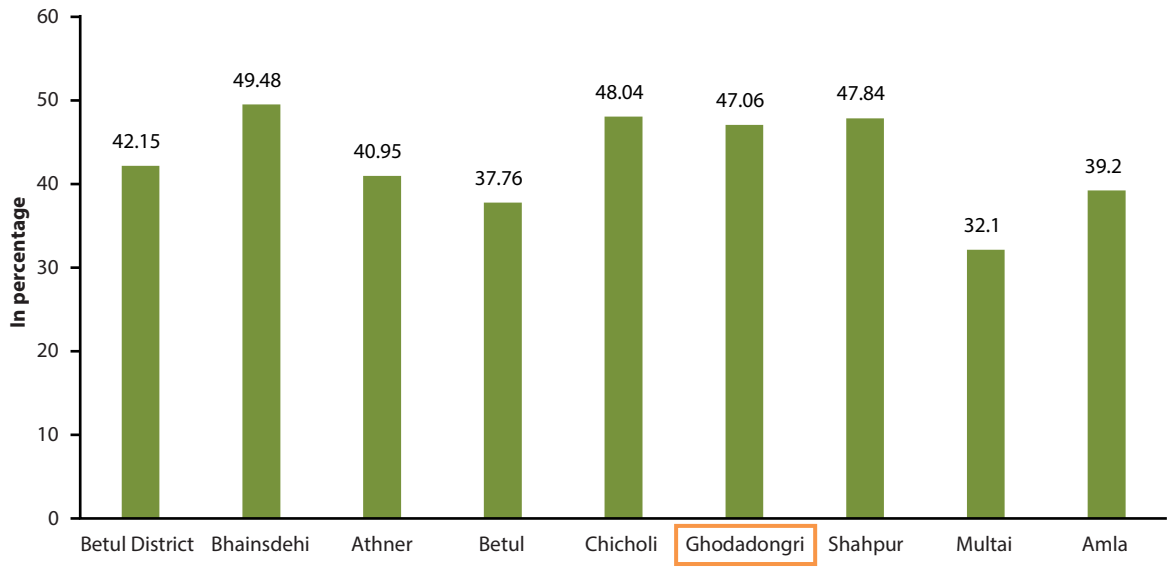



**Figure 60: Rural illiteracy rate, Betul**

*Source: Socio Economic and Caste Census 2011, Ministry of Rural Development*

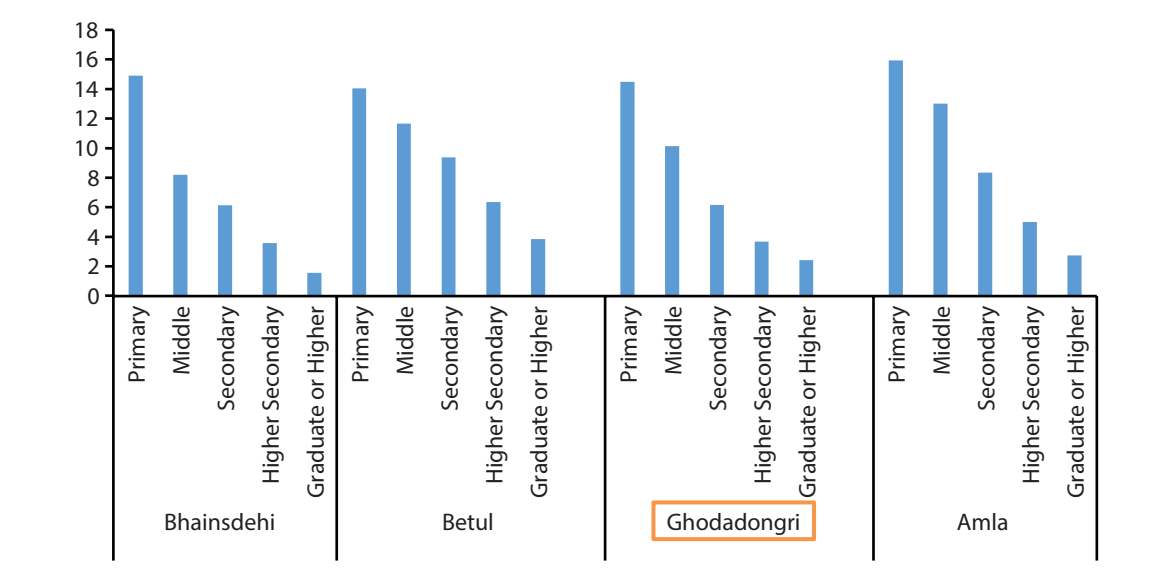



**Figure 61: Education level (rural) across tahsils, Betul**

*Source: Socio Economic and Caste Census 2011, Ministry of Rural Development*

from UP, Bihar during mass recruitment drives), at present there has been a continuous outflux of workers in search of livelihood. The shift in industry has impacted the labour market of the place.

For the public sector employees, formal employment guarantees wages and benefits, occupational safety, paid leave, social protection (including health and education for family), and protection from exploitation. Regular employees have exclusive access to schools and hospitals that have been setup by the industry.

The biggest challenge in the region is the overall enforcement of labour standards with the informal workers. Exclusion from decent wage results in limited access to health care, education, and basic services. These workers and their families get trapped in a continued cycle of poverty.

For lack of better alternative, the region faces the brunt of distressed out migration. They migrate to seek better employment opportunities, better access to education, medical, and other services.

## 3.9 Hearing First-hand from the Youth, the Front runners of Transition

We attempted at understanding the experience of local youth in the present labour market, in a meeting facilitated by Pathakhera Coalfields. Some of the constraints they face include lack of alternate employment opportunities, depressed wages, general decline in trade in the region, limited financial support mechanism for developing entrepreneurship, lack of medical amenities, constraints in mobility due to sick and aging family members amongst others. An aspirational labour market for them is one where there are jobs that match their skills, where technical skills are promoted, small enterprises are encouraged, and information gaps on education and employment opportunities are addressed. The following are a few snippets of the discussions with the youth.

## 3.10 Rising Undercurrents and the Political Demand for More Mines

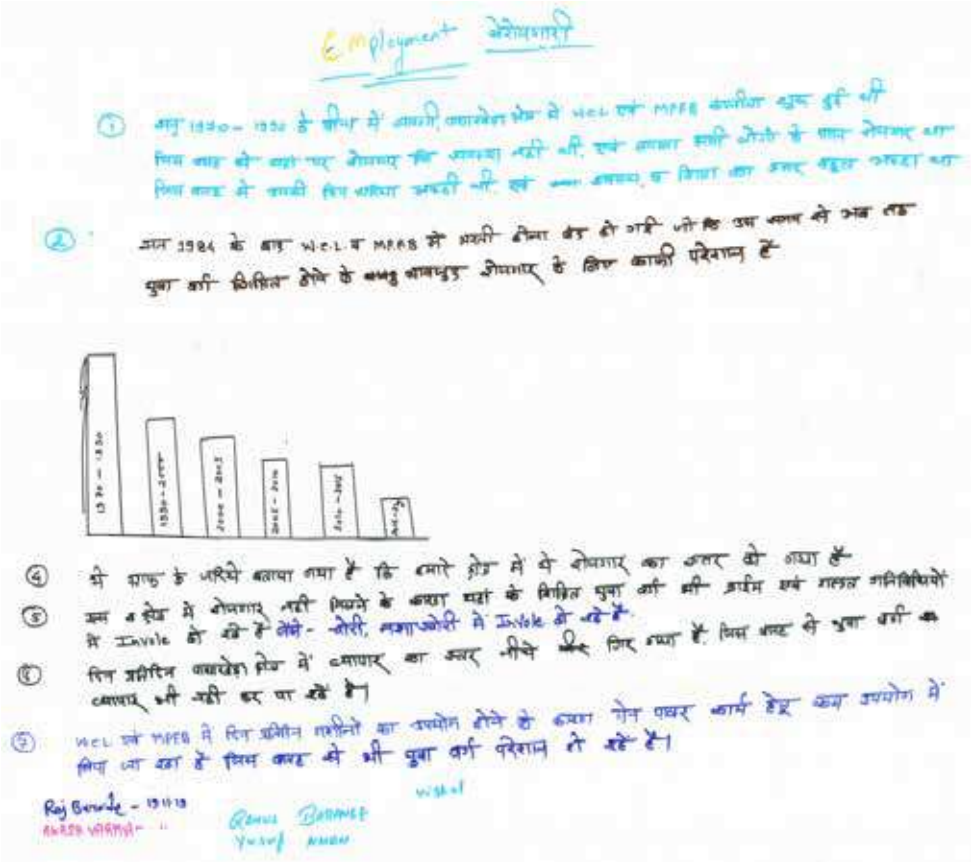
Though it was informed that the mines in Pathakhera will be closed, the area witnessed disruptions. Trade Unions insist there are still mineable reserves of coal in the closed mines and the decision to close should be re-considered. Discussions around moving away from coal is remote. However, aspirations are raised on newer mines: TAWA III and Gandhigram. These have received their statutory clearance from WCL, but their Forest and Environmental clearances are still awaited. These mines have estimated their manpower requirement at 1500.

**Strong resistance and protests**

Over the last four years, Sarni has witnessed an




**Picture 6: Youth in discussion**



Employment बेरोजगारी

① सन् 1980 – 1990 के दौरान में आसपास क्षेत्रवेड़ा क्षेत्र में WCL एवं MPEB कंपनीज शुरू हुई थी जिस वजह से यहां पर रोजगार की समस्या नहीं थी, एवं आसपास कोयले के साथ रोजगार था जिस वजह से यहां पर कोई समस्या नहीं थी एवं अच्छा व्यवसाय व शिक्षा का स्तर बहुत अच्छा था

② सन 1984 के बाद WCL व MPEB में भर्ती होना बंद हो गई जो कि उस समय से अब तक युवा वर्ग बेरोजगार होने के कारण बहुत रोजगार के लिए काफी परेशान हैं



④ ये ग्राफ के जरिये बताया गया है कि हमारे क्षेत्र में से रोजगार का स्तर कौ गया है

⑤ इस क्षेत्र में रोजगार नहीं मिलने के कारण यहां के शिक्षित युवा वर्ग भी अपराध एवं गलत गतिविधियों में Involve हो रहे हैं जैसे - चोरी, लूटपाट में Involve हो रहे हैं

⑥ जिन प्रतिशत वाकवेड़ा क्षेत्र में व्यापार का स्तर नीचे गिर गया है जिस वजह से युवा वर्ग का व्यापार भी नहीं कर पा रहे हैं।

⑦ WCL एवं MPEB में जिन प्रतिशत मशीनों का उपयोग होने के कारण गोल पत्थर कार्य हेतु कम उपयोग में लिया जा रहा है जिस वजह से भी युवा वर्ग परेशान हो रहे हैं।

Raj Gawde - 13113
Rahul Barange
Yusuf Khan

① उच्च शिक्षा अभाव और तकनीकि शिक्षा का अभाव।
② शिक्षा अनुसार रोजगार का अभाव।
③ रोजगार के उपयुक्त। साधन उपलब्ध नहीं है।
④ उद्योगों का स्थापित नहीं होना।
⑤ स्थानिय क्षेत्र में स्थापित उद्योग का अभाव।
⑥ स्थानिय क्षेत्र में विविधता का अभाव।
⑦ स्थानिय लोगों का पलायन रोजगार आभाव के कारण।
⑧ कम्पनी के प्रबंधन व्यापार में कमी।
⑨ प्रशिक्षित रोजगार के साधन उपलब्ध नहीं होना।
⑩ रोजगार में उचित वेतन मान न मिलना।
⑪ बेरोजगारी के कारण में आपराधिक गतिविधि बढ़ना।
⑫ उद्योगों का विकसित न होना।
⑬ त्रुटिपूर्ण शिक्षा प्रणाली।
⑭ कुशिर उद्योग तथा लघु उद्योग अभाव।
⑮ रोजगार उन्मुखीकरण का प्रचार न होना।

:- सुझाव :-
① स्थानिय उद्योगों का विस्तार।
② नये उद्योगों का स्थापितिकरण।
③ स्थानिय शिक्षण एवं उद्योगों के तालिय तालमेल से रोजगार की मात्रा उनके शिक्षा के अनुसार।
④ स्थानिय संस्थानिक संचालनों द्वारा शिक्षा और रोजगार के लिए जागरूकता फैलाना।
⑤ लघु एवं कुशिर उद्योगों के लिए सहयोग।
⑥ व्यक्तिगत रूप और आर्थिक रोजगार व्यक्तियों अपना चाहिए।
⑦ ग्रामीण/शहरी योजनाओं का संचालन।
⑧ स्वरोजगार की संभावना उपलब्ध होनी चाहिए।
⑨ सरकार से सिलिंडर उपयोग मिलने चाहिए।
⑩ तकनीकि शिक्षा को बढ़ावा देना एवं नये तकनीकि शिक्षा संस्थान

दिनांक 13/11/2019 चाकवेड़ा

① समीर [illegible] (RAMESH MANIKAR PAL)
② अनिता निशपुरे
③ अमित उइके
④ विनय चव्हान
⑤ विजय परिहार
⑥ सुनिता पवनकर
⑦ विनोद किसरे
⑧ लोकेश लोहान
⑨ अनिल सोनी



**Picture 7: Discussion Snippets**

increase in protests and sit-in dharnas by forums such as Udyog Bachao Nagar Bachao (Save Industry Save City) Sangharsh Samiti who represent the interests of the traders and transporters in the area and raise voice for addressing the twin problems of unemployment and outmigration by opening new mines. Besides the demand for new mines, the forum has also demanded new units of power plant (of 600 MW), employment opportunities in power generation, and Sarni to be declared as a separate tahsil. As businesses and trade are concentrated in Sarni, the forum opines that the office of the tahsildar should be near Sarni residents. On multiple occasions they have put up demands that local transporters of coal be given preference over those from the outside district. During the pandemic, they strongly resisted the setting of the annual Rajasthan Trade Fair in Sarni.

**Increase in incidences of crimes**

As pointed by officials of the energy industry, administration, unions amongst others, much of this is attributed to mine closures. Theft of cables and pipes from abandoned mines, theft in residential quarters of the industry and from fly ash dykes, theft of diesel from trucks in waiting have been reported to be the most common. Figure 62 shows the cases of police interventions in Sarni subdivision over a 18-year period.

Besides the increase in the cases of police interventions, youth and some officials mentioned the increase in substance abuse and alcoholism because of mounting unemployment.

**Reported increase in referral cases of mental health**

Union representatives and medical team in the coalfield have also pointed to reported cases of stress and anxiety amongst employees and their family. The decline in the township, outmigration of retired employees, loss of social cohesion, and the general lack of employment opportunities are some of the triggers pointed out by the stakeholders. As there are not enough doctors at the area hospital, most of the cases are referred to major cities such as Nagpur or Bhopal (Figure 63).

**Decrease in property rates of revenue land**

With the boom in the energy industry in the area, the property value in Bagdona (the non-industrial municipal ward) and in neighbouring villages rose.



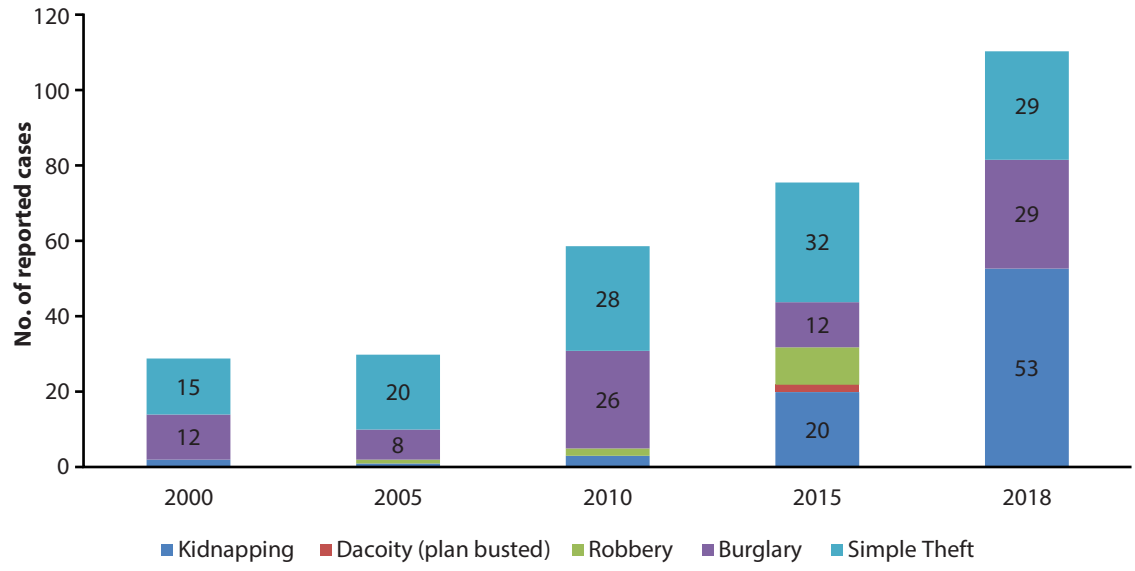



**Figure 62: Reported crime (select) in Sarni subdivision, 2008–18**

*Source: Office of the Superintendent of Police, Betul*

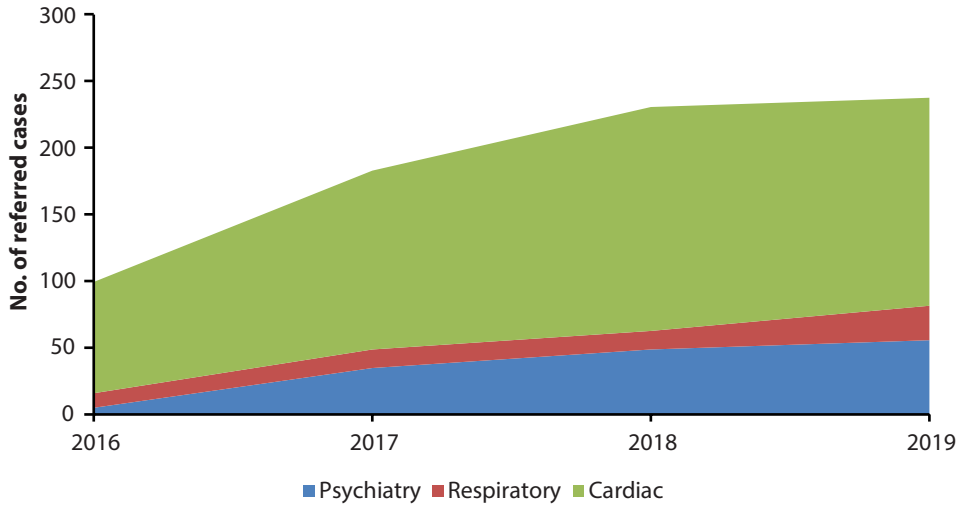



**Figure 63: Referral cases from area hospital, Pathakhera Coalfield**

*Source: Office of the Area Medical Officer, Area Hospital, Patahkhera Coalfield*

Along with trade and commerce, the business of real estate flourished as there was a demand of houses from retired employees. With the closure of mines, Sarni witnessed population decline (10% between 2001 and 2011 Census) as retired employees chose to migrate out due to the slackening economic activities. The Tahsildar, Ghodadongri shared that from a rate of INR 500–600 per square feet in 2010, the property value has come down to INR 300 per square feet today. In Pandra, a downstream village, locals mentioned the loss of potential income as earlier employees had bought land from them to settle down.

Doubly burdened by poverty and the pandemic, the political pressure to open new mines is such that no political party/candidate would risk displeasing this constituency.

## 3.11 Discussion

This report does not support opening of new mines or promoting employment in mines. All it has attempted is to highlight that the workforce in coal mines is highly fragmented. The growing informal workforce has not attracted attention of the stakeholders.

A likely scenario is that soon, the proposed Gandhigram and Tawa III mines may open, pushing a huge contract market, even as introduction of mass production technology with deployment of continuous miners is proposed. The impetus then is greater to propose alternatives work opportunities and appropriate skill building, to enable workers to exercise a choice to work in the coal mines or not.

Those in the informal workforce are the poor, and the poor working conditions make these jobs more precarious, entrapping them further in poverty. This race to the bottom will damage the labour market of the future. There are gaps in governance and much work in promoting decent working conditions, for the informal workers remains. Contracts also need to be evaluated on the compliance of working conditions agreed therein and any deviation should result in penalties or barring engagement with the contractor.

Inequality, particularly income inequality within the industry and inequality between the urban and rural in the coal region, needs to take a central place in any discussion around a transition that aims to be just and equitable. Even though compulsory primary education has resulted in the high attainment ratio at this level, but the incentive for enrolment in secondary and above are few. If jobs of the future are expected to be around industry 4.0, are we ready?

Poverty continues to being a strong deterrent even today, in accessing health care and nutrition. Given the bulk of the workforce in coal mining is non-executive, in the Groups C and D category, it implies their exposure to hazardous conditions. Miners have shared prevalence of occupational lung diseases such as chronic bronchitis, asthma, tuberculosis, as well as musco-skeletal problems, hypertension, diabetes amongst others. Discussions in the community have brought up concerns of reduced life expectancy of miners. There is much that needs to be done in prevention and treatment.

A transition away from coal is now juxtaposed with industry 4.0 transition, the recent economic and migrant crisis brought about by the pandemic. Investments in workers capacities by ramping up education, skills, health infrastructure, and enhancing opportunities hold key to making any transition meaningful.

The industry gave rise to the bustling town of Sarni. The dependence of this municipal town on the industry has created a lock-in situation. Issues of declining population, land ownership with the industry, volatility in income as industry declines, are among some of the practical challenges that the municipal body faces in developing a Master Plan. That this is home to some of the vulnerable population, it is important a Master Plan for the region also addresses inequality at the household level. Revenue realized from the industry can be re-invested in developing long-term infrastructure, diversifying the local economy, and creating a skilled workforce.

# 4 Agrarian Landscape: Understanding the Economy Beyond Coal

## 4.1Pandemic and the Returnees

During the pandemic, the nation witnessed an unprecedented scale of reverse migration. Madhya Pradesh alone received 13.10 lakh workers (workers at 7.30 lakh and their family members at 5.79 lakh).[1] Betul figures in the list of the 116 districts declared as *atma nirbhar* by the centre, i.e., those districts which had received more than 25,000 returnees during the pandemic.

The country's employment scenario has an overwhelming proportion of the informal sector (accounting for more than 90% of the total workforce). With the economy coming to a grinding halt and livelihoods being lost, millions were forced to return to their villages from hubs of economic activities. Governments at the centre and states launched assistance programmes for migrants and famers with special focus on boosting rural economy through agriculture and allied activities amongst others.

## 4.2 The Stress on Agriculture

As emphasized in the previous section, the employment opportunities in the district are limited and there has been a large and regular outflow of workers. Despite the district being largely agrarian, the capacity of agriculture sector to address the challenges of unemployment and food security has been limited. The situation could only get aggravated with the advent of the returnees. To address sustainable transitions, it is important to take cognizance of the fact that the district per capita income has been lower than that of the state and a steadily declining 'main' workforce, which has become only worse in the last few years.

The kinds of crisis that agriculture faces in the district can be gauged from the declining percentage of cultivators (as a full-time farmer, having worked for more than 180 days in a year) and the increasing share of agricultural labour (Table 8).

**Table 8: Changing composition of cultivators in Betul over two Census periods**

| | Cultivators (%) | Agricultural labourers (%) |
|---|---|---|
| Census 2001 | 41.8 | 37.7 |
| Census 2011 | 32.2 | 45.5 |

A combination of challenges that the farmers continue to face are water logging owing to unusual rainfall in short span, diversion of land to other use (mining as a case in point), post-monsoon water crisis, insufficient labour availability (with male members migrating out), inadequate access to finance and at times lack of access to post-harvest infrastructure, inefficient supply chains, markets (more on this is explained in the subsequent section on experiences of mining villages), amongst others.

The Agricultural Contingency Plan document for Betul[2] specifies that the district is regularly prone to pest and disease outbreaks (root rot in soybean, borer in gram and maize, blast in rice) and occasionally prone to drought, heat and cold waves, and frost. Those at the margins have limited capacities to adapt, making them vulnerable in the face of these events. These

1 Details available at sambal.mp.gov.in, last accessed on 10 July 2020.

2 Details available at agricoop.nic.in/sites/default/files/MP27_Betul_20.05.2013_0.pdf.

vulnerabilities will only exacerbate with climate change-induced effects.

## 4.3 Understanding the District's Agriculture (not Including Fisheries)

### *4.3.1 Change in Farmers' Composition*

Figure 64 shows that a sizeable portion of farmers are marginal and small farmers,[3] constituting 56% of the district's total farmers in 2010–11. Within half a decade, more numbers were added to this category, taking its share up by 6% in 2015–16 to constitute 62% of the total share.

While the number of marginal and small farmers increased, there was a decrease in the numbers of small–medium, medium, and large farmers indicating a shift to smaller land holding and questioning the sustainability of this sector. The share of land of the 62% marginal and small farmers together is 25%, against 28% land under 23% of small-medium farmers, 35% land under 13% medium farmers, and 9% with 2% large farmers.

### *4.3.2 Changing Cropping Pattern*

Data from district Census of 1961 and 1981 along with data from the District Planning Office show a transition in agricultural crop portfolio in the district. Table 9 shows percentage area under each crop in each of the broad categories: food grains, pulses, oilseeds, horticulture, fibre, other cash crops (including sugarcane), and fodder.

#### 4.3.2.1 Food Crops

There has been a declining trend in the percentage area under the food crops category. Cereals, millets, and pulses accounted for a little more than 93% of the NSA in 1961; it fell to 83% in 1981, 54% in 2008, and came down more than a half to just 42% in 2016–17.

Sorghum and kodo kutki (indigenous millet) were the principal kharif crops in 1961 and in 1981, occupying two-fifths of the net sown area (NSA). But the last two decades has seen a considerable fall in area under sorghum and kodo kutki cultivation and, as of now, it holds an extremely marginal share of 0.2% only.



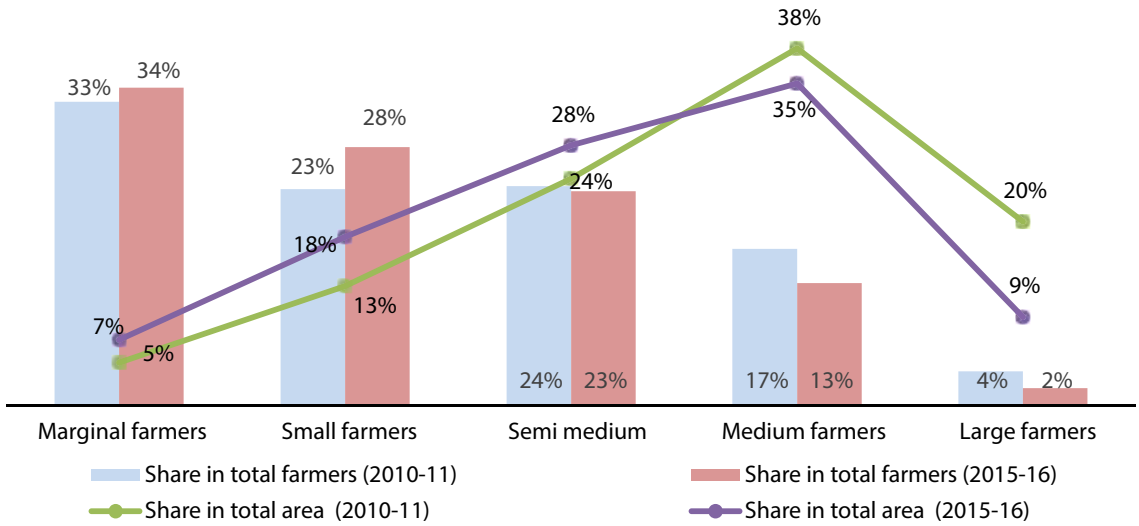



**Figure 64: Landholding of farmers, Betul**

*Source: Office of the District Planning Officer, Betul*

3 Marginal farmers have land holding of less than a hectare (ha), small farmers have more than 1 ha but less than 2 ha, Small–medium farmers have more than 2 ha but less than 4 ha, medium farmers have more than 4 ha but less than 10 ha and large farmers have more than 10 ha.

**Table 9: Percentage area under each crop**

(i). Percentage area under food grains (cereals and millets)

| Year | Wheat | Paddy | Sorghum | Maize | Other (Incl kodo kutki) | Total cereals and millets |
|---|---|---|---|---|---|---|
| 1961 | 17.6 | 5.6 | 18.0 | 3.2 | 20.0 | 64.4 |
| 1981 | 13.7 | 8.5 | 18.5 | 4.0 | 18.5 | 63.2 |
| 2008–09 | 18.0 | 7.0 | 7.0 | 7.7 | 2.0 | 41.7 |
| 2016–17 | 18.0 | 4.7 | 2.2 | 7.6 | 0.6 | 33.1 |

(ii). Percentage area under pulses

| Year | Chickpea/Chana | Pigeonpea/Tur | Black gram/Urad | Other pulses | Total pulses |
|---|---|---|---|---|---|
| 1961 | -- | -- | -- | -- | 28.9 |
| 1981 | -- | -- | -- | -- | 20.0 |
| 2008–09 | 6.0 | 4.0 | 1.3 | 1.4 | 12.7 |
| 2016–17 | 4.6 | 1.8 | 0.5 | 1.7 | 8.6 |

(iii). Percentage area under oilseeds

| Year | Groundnut | Sesame | Soybean | Other oilseeds (Niger) | Total oilseeds |
|---|---|---|---|---|---|
| 1961 | 6.2 | | | | 12.3 |
| 1981 | | | | | 12.2 |
| 2008–09 | 0.9 | 3.0 | 36.0 | 0.3 | 40.2 |
| 2016–17 | 0.7 | 0.1 | 32.1 | 0.2 | 33.1 |

(iv). Percentage area under horticulture, cotton and sugarcane

| Year | Fruits | Vegetables | Spices | Cotton | Sugarcane |
|---|---|---|---|---|---|
| 1961 | -- | -- | -- | -- | -- |
| 1981 | 0.43 | -- | 0.6 | --- | -- |
| 2008–09 | 1.0 | 1.0 | 0.5 | 0.03 | 0.1 |
| 2016–17 | 0.1 | 1.25 | 0.3 | 0.2 | 1.7 |

(v). Percentage area under fodder, other cash crop

| Year | Medicinal* | Fodder | Other cash crop | Total non food crop |
|---|---|---|---|---|
| 1961 | -- | -- | -- | -- |
| 1981 | -- | -- | -- | -- |
| 2008–09 | None | 1.6 (10244 ha) | 0 | 42 (266140 ha) |
| 2016–17 | None | 0.6 (4485 ha) | 34 (261585) | 68 (524995 ha) |

*Source:* *1. District Census Handbook, Betul District, Census of India 1961, Madhya Pradesh*

*2. District Census Handbook, Betul District, Census of India 1981, Series 11, Madhya Pradesh*

*3. TERI analysis based on data provided by District Planning Office for the years 2008–09 and 2016–17.*

** Data on area under Medicinal and Narcotics plant were shown between the period 2010–11 and 2014–15. This was found only in tahsil Athner, covering 34 ha (2010–11), 92 ha (2014–15) and 86 hectare (2015–16).*

Kodo kutki has been a traditionally grown millet in this area and is characterized by its high nutrient content, drought tolerance, and an ability to grow on marginal soils. But without a minimum support price (MSP), poor procurement commitment and low prices, often farmers did not find it remunerative enough to be grown further. As a result, there was a shift from kodo-kutki to soybean and other crops, which have higher commercial value.

Wheat and paddy continue to command similar percentage of area as in the previous years, while maize has grown in popularity. The increase in area under maize can be attributed to the increase in demand from the poultry sector. Area under pulses has steadily declined.

The trend towards intensification of a few commercial crops has resulted in the decline of agro-biodiversity in the district. Literature indicates that rich agro-biodiversity improves the resilience of the larger agro-ecosystem and erosion of such biodiversity increases the vulnerabilities of the area.



#### 4.3.2.2 Non-food Crops

Oilseeds have gained significance as principal kharif crops. Introduction of soybean has marked a significant departure from the earlier composition of the oil seed basket, which was dominated by groundnut. Groundnut then was an important commodity of trade from the district. Since its introduction, soybean has come to occupy one-third of the NSA.

Area under cotton and sugarcane has progressed. It is important to note that in the same period (2008–09 and 2016–17), sugarcane production in the district has increased three-folds from 24 tonne to 80 tonnes. Sugarcane is a water-intensive crop, but because it has a protected price mechanism by the government, farmers find it attractive to grow.

### *4.3.3 Fodder*

Area under fodder has been shrinking each year. Noticeably, between the period 2012–2013 and 2016–17, it fell by 56%. Figure 65 shows the declining population of the milch livestock, where the total cattle population declined from 77% in 2008–09 to 43% in 2016–17. Declining milch livestock may be attributed to the declining fodder area as also the heat stresses that the place experiences.

### *4.3.4 Irrigation*

The average percentage of net irrigated area to net sown area in the district in the five year reference (2010–15) period has been 28. It declined from 32% in 2010–11 to 27% in 2015–16, suggesting that agriculture is largely rain fed. While the area under irrigation shows a quantum jump of 43%, the net sown area grew at 7% in the reference years. This may be attributed to adoption of multiple cropping practices in areas with assured irrigation facilities.

Groundwater continues to be the mainstay of irrigation and within it, wells continue to be the dominant source, irrigating more than 40% of the irrigated area in the district. Though the share of

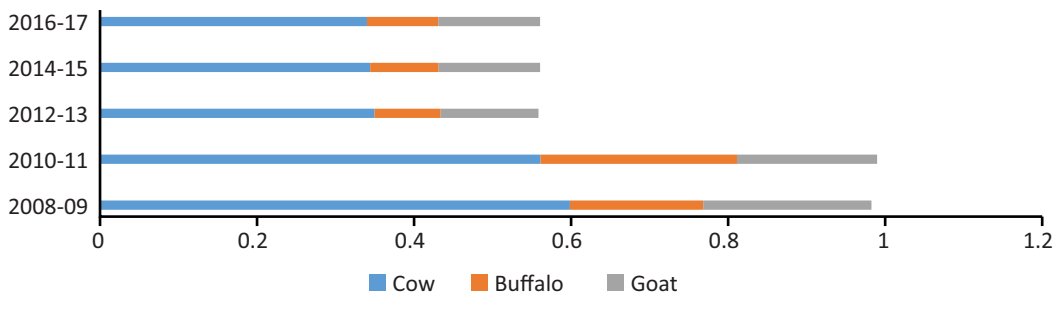



**Figure 65: Declining milch livestock, Betul**

*Source: TERI Analysis based on data from the District Planning Office, Betul*

surface water has increased over this period, the increase in pond irrigation is almost equal to the increase in canal (canal irrigation here refers to both public and private) irrigation (Figure 66).

As mentioned earlier, the region is occasionally prone to drought and heat wave. In such a situation, the canals may run the risk of limited, delayed, or even non-release of water. Increase in ponds, to harvest excess rainwater during high rainfall, could be a strategy adopted to address the drought situation. The emerging water crisis has been compounded by over drawing of groundwater reserves through deep submersibles in tube well, shift of crops from millets and pulses to water guzzling crops such as sugarcane and soybean, and water usage by the energy industry. As solar pumps are not yet popularized in the area, 84% of the farmers use electrified pump sets.

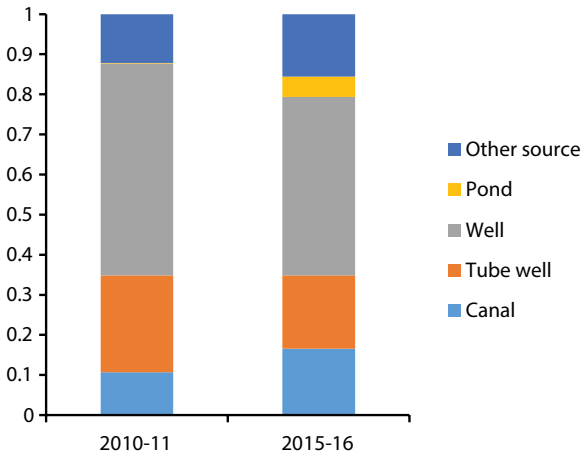



**Figure 66: Irrigation sources, Betul**

*Source: TERI Analysis based on data from the District Planning Office, Betul*

### *4.3.5 Emerging Issues of Groundwater*

A 2013 report of the Central Ground Water Board for Betul[4] identifies depleting groundwater level as a major issue. This report highlights depletion of groundwater levels both pre- and post-monsoons in its monitoring wells. It further mentions that in some blocks (Multai and Athner), the groundwater levels are advancing from safe to semi-critical levels due to agriculture. The report recommends changing of cropping pattern in areas showing decline in water levels as sugarcane and soyabean are water-intensive crops. The geology of the place limits drilling beyond a particular depth. It also mentions the possibility of groundwater pollution in Sarni due to fly ash from the power plant.

## 4.4 Linkages Between the Energy Industry and Agriculture

A rapid appraisal of how the agricultural practice in villages in the vicinity of the two energy industries has been impacted was undertaken. It is to be recalled from Figure 43 in section 2, that rural Ghodadongri has the highest percentage of households in manual casual labour (60%) and the least percentage in agriculture (28%) amongst all the tahsils.

To understand the kinds of change and perceptions around it (voices of contestations from villages where mining has been proposed), discussions with key people of the village were held. Stakeholders in the discussions included the panchayat officials, retired employees (of the energy industry), women's groups, government teachers, the youth, and the senior members of the community amongst others. This section covers the popular sentiment as shared by the locals as we have not corroborated the facts.

For a nuanced understanding, villages covered are broadly grouped into three:

1. Villages which are under active mining
2. Villages in the vicinity of mining and power plant
3. Villages not in the vicinity of mining but proposed for mining

### *4.4.1 Villages under active mining*

**Village Shobhapur**

*Brief background:* Underground coal mining in this village started in 1975. By March 2021, the mines are expected to close down as the reserves have exhausted. STs constitute 76% of its population.

4 District Ground Water Information Booklet, Betul District, Central Ground Water Board, Ministry of Water Resources, 2013

**Picture 8: With panchayat representatives and teachers, village Shobhapur**

*Employment:* A few households were provided regular employment by WCL in lieu of land acquired or on grounds of compassion. Mostly people find work on daily wage basis as contract workers in mines and during construction phase of power plants, or work on trucks and tractors. Women are largely employed as agricultural labourer.

*Agriculture:* Due to mining, the soil has gradually lost its fertility, demanding excessive application of fertilizers. Mining has caused lowering of water table and this village is demanding submersible pumps from WCL.

Agriculture is largely subsistence as there is not enough to go to the mandis/markets. Maize is grown in kharif season. It was the excessive rains of 2019 that damaged the standing crop. Vegetables are grown only for self-consumption. As the input costs (fertilizers) to vegetables and the associated labour requirement are very high, vegetables cannot be grown in the volumes that would meet the demands of the township.

**Village Chhatarpur**

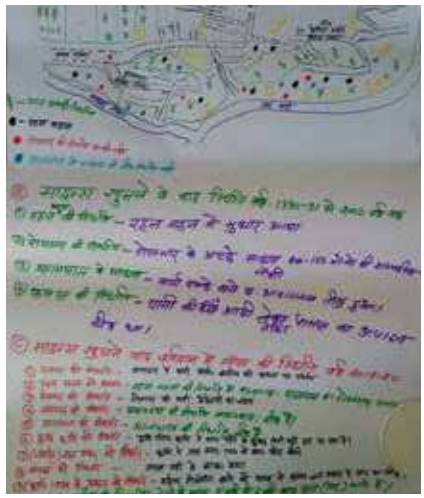
*Brief background*: Mining operation started in the village in 1992. STs constitute 76% of its population. Box 1 gives a detailed description of what we heard from this village on mining and its impact as experienced, since the beginning of mining operations till present.

### *4.4.2 Villages in the Vicinity of Mining and Power Plant*

**Village Pandhra**

*Brief background:* The village is situated 11 km downstream of WCL office, Pathakheda. The village is inhabited by the Gonds tribe (constituting 50%), OBCs at 30% (predominantly Yadav), and scheduled castes at 20%.

*Employment:* Employment in mining was not a preferred option as connectivity infrastructure in the



**Picture 9: Mapping the change**

**Box 4: Details from village on mining and its impact as experienced**

*Pre-mining phase*

The village was thickly forested, and a substantial number of people would depend on the forest for livelihoods including firewood. Water was sourced from nearby streams. Agricultural produce was in surplus. Transport infrastructure was inadequate, and roads were unmetalled. Besides agriculture, the village had no other employment alternatives.

*Phase when mines operated*

From the village, 100–150 people received regular employment in the mines. WCL supported in building infrastructure – roads, community halls, schools amongst others. With improved infrastructure, movement of goods and services and of people was greatly facilitated. Water shortages were beginning to show, but it had till then not impacted agriculture.

*Two and a half decade of mining and the present day*

Regular mining jobs have been completely replaced by contractual work. On average, there is work for about nine months, under a contractor. Life expectancy of mine workers has reduced and an increase in mortality cases of retired mine workers by 65 years of age is being experienced.

The process of de-pillaring in mines has begun. This causes tremors on the ground and surface cracks are seen in the fields and on house walls. People are fear struck and some have stopped farming. More farmers are pushed into marginal land holding now, as a substantial part of the land is non-arable. Under the Mahatma Gandhi National Rural Employment Guarantee Act (MNREGA), works for pond building was undertaken. However, the ponds created have collapsed.

Water table has reportedly gone down to a depth of 700 feet and summer months are becoming increasingly difficult in face of the water crisis. Coal dust has affected the produce and the soil fertility. Legumes like *tur* (pigeon pea) and millets such as *saawa, kodo, balhaar,* which were popularly grown, are now replaced by only the kharif crops of paddy and maize. Paddy offers an assured procurement at Minimum Support Price, hence it is grown despite the adverse water table.

Forest cover has been erased completely, taking away the next sustainable livelihood to agriculture-dependence on non-timber forest produce (NTFP).



early days of mining was poor. However, a few who took up mine employment have retired now. Youth take up work as contractual labour on construction sites or when chimneys at power plants are constructed.

*Agriculture:* **Farmers here grow vegetables and sugarcane. Vegetables are grown to meet the demand of the coal town. With mines closing and the town witnessing de-population, the markets for their produce has shrunk. This has resulted in falling prices and unsold stocks. With no infrastructure for storage, the unsold vegetables perish.**

Yadavs are the primary livestock-rearing community. Besides a fall in prices of milk, they face the problem of reduced grazing land for the available livestock.

### Villages Sukhadhana and Salaiya

*Brief background:* These villages are situated at 8 and 9 km respectively, downstream of WCL office. While Sukhadhana has a 60% of the population as

**Picture 10: Discussion with the community of a downstream village, Salaiya**

scheduled tribes, Salaiya has a composition of 10% scheduled tribes and 30% scheduled castes.

*Employment:* People from Salaiya find daily wage work around construction sites and very few chose to work in mines. Youth from Sukhadhana are engaged as contractual mine workers. Agriculture is no longer remunerative forcing people to move out in search of work.

*Agriculture:* Heat and water stress due to mining has affected the cropping pattern. Rabi is grown only by those farmers who can afford irrigation. Paddy and maize remain the primary crops. Settling of fly ash severely affects the produce.

**Villages Mordongri and Bakud**

*Brief background:* These villages are located at distances of 3 and 5 km respectively, from the Sarni power plant.

*Employment:* Earlier, people found employment in the power plant. With no new employment opportunities in the power plant, the youth has migrated out in search of employment. Some migrate within the district for two to three months in a year for work. There are two rice mills in this village and they rely on workers from Bihar for operations as local youth is unavailable.

*Agriculture:* Chimneys with lower height at the power plant emit excessive ash, destroying food crops and fodder. Maize crop of 2019 was destroyed by excessive rains.

**Village Belond**

*Brief background:* Situated 15 km downstream from Sarni power plant, this village has more than 70% scheduled tribes inhabitants, primarily the Korkus.

*Employment:* Livelihoods are based on bamboo and bamboo products. None of the inhabitants here has ever worked in the mines or in power plants, citing absence of connecting infrastructure.

*Agriculture:* Kodo kutki is grown, followed by maize.

### *4.4.3 Village Proposed for Mining*

**Village Shaktigarh**

*Brief background:* Coal reserves to the extent of 63 MT and 30 MT have been explored in the villages of Shaktigarh and Gandhigram, under the Shaktigarh Panchayat. This village-region consists of settlers from Bangladesh and those re-settled from Myanmar (Burma repatriates) in the 1960s–70s. This community has been credited with the introduction of paddy in the district. There is a strong resistance in the village against land acquisition for mining. Experiences of the neighbouring villages that witnessed mining are evidence enough of how negatively agriculture will be impacted. The region owes its prosperity to agriculture.

*Employment:* Very few people from here worked in either of the energy industry; those who did are now retired. Agriculture is the mainstay and both kharif and rabi crops are grown. Increased fragmentation of land holding has made agriculture less lucrative and as a result, youth is migrating out. Collection of forest produce provides for only two months of livelihoods in a year. Popular forest produce is *mahua*, *tendu* leaves, and *chironjee*.

*Agriculture:* The region meets the demand for vegetables of Pathakhera and Sarni. Agriculture is mechanized and use of tractors and harvesters are common. After meeting the requirements of the two towns, the surplus vegetable produce finds it way to the mandis. Farmers own vehicles for transportation of produce to the mandis. Delay in harvesting season

**Box 5: Non-Timber Forest Produce**

As a senior forest official shared, NTFPs used to be a traditional source of income; however, they are not lately so. The middleman's domination and early harvesting of those NTFPs which have better economic returns are challenges being faced in realizing the true potential of NTFP market despite governmental interventions.

*Tendu patta* (tendu leaves from the Indian Ebony), *mahua*, and *aaonla achar* continue to be the widely collected NTFPs. *Tendu* is procured from cooperatives of collectors and *mahua* is sold in the open market (*mahua* is supported by a minimum support price by Forest Department).

Kullu (a tree used for gum extraction has high medicinal value besides high value in the international market), musli (the costliest medicinal herb in the local market, now endangered and found in the forests of Gujarat, Maharashtra and MP), amla, bamboo, chironji, which were once readily available, have become very difficult to procure even by the Forest Department.

is experienced due to water shortage and heat.

Although mining may geographically seem to be limited to a sub-district/tahsil, but it has had varying impact on agriculture not only in its vicinity but also across the district. There has been intense competition for water and land as the latter was both fertile at the top and coal-laden below, eventually driving the rural agrarian community of that locale to the margins. The local agrarian communities did take up jobs in mining to supplement their farm incomes, though few in regular employment but lately and increasingly as informal workers in mines with intermittent work. The towns of Sarni and Pathakhera were ready markets for the agricultural produce of the downstream communities. As these urban centres experience depopulation, the demand for agricultural produce has been steadily shrinking. The infrastructure of roads, electrification, etc. built by the mining companies, even if primarily for its own purposes, did indirectly benefit the agriculture ecosystem.

## 4.5 Discussion

This section has brought together data and evidence to expound how agriculture has been unfolding in the district over the last two decades. The rural community of farmers, farmer turned miners, and workers have been experiencing marginalization and casualisation of sorts and as the once large and medium farmers turn to small and marginal ones, more numbers are taking up work as agricultural labourers and casual labour in the mines to supplement reduced farm incomes.

During the pandemic, those already in precarious livelihoods would have been pushed further into marginalisation. That the marginal product of labour in agriculture is negligible, the challenge will lie in generating productive and remunerative employment opportunities while at the same time ensuring food security. That agriculture will stay, a shift from status quo will entail identifying pathways that address inequality, enhance income, raise nutritional standards, and are low carbon.

A significant proportion of the revenue generated from mining, particularly from the District Mineral Fund (DMF), has been channelled to meet the water demands for agriculture, across the district. Increasing consumption of energy in irrigation is seen by the increased usage of electrical pump sets. Solar pumps can offer better alternatives if coupled with efficient irrigation techniques and changes in crop pattern.

Shift from food crops to cash crops, from millets to sugarcane and soyabean has a direct bearing on increasing food insecurity. Growing cash crops when

there is already a limit to water availability and arable land, increases susceptibility to shocks, given that the area is already prone to drought.

If more perishable products such as vegetables and fruits are produced, income insecurity will grow if ready access to market is not made available. Revenues from mining can help develop infrastructure such as road (including feeder roads) to aid in overcoming the challenges of market access. Other infrastructure can also be developed including reliable and quality electricity, particularly renewable source of electricity with storage for farming operations. The revenues from mining can also facilitate investments in collection, cold storages, transport infrastructure including refrigerated transport, local agro-processing units (other than sugarcane and cotton) and all those processes that lie in between the 'farm to fork' and in moving up value chain.

Investments in infrastructure also open opportunities for productive and full-time employment around assembly and maintenance of equipment and infrastructure. The mining subsidiary has the requisite vocational training centre.

A Supreme Court Order [WP (Civil) No(s) 114/2014 *in Common Cause Vs Union of India and others*] has made it compulsory for mining companies to re-grass the mined-out area suitable for the growth of flora and fauna. The order emphasizes land restoration to a condition, which is fit for growth of fodder, flora, and fauna.

Careful assessment of the abandoned mines for repurposing them for grazing land and pastures, identifying scope for secondary agriculture activities like apiculture, needs to be considered. Apiculture contributes as natural pollinators, assuring crop yields and enhancing farm incomes.

Likewise, regeneration of native species and medicinal plants to help in diversification and promotion of agro-based entrepreneurship is well suggested. Agroforestry, though has been traditionally practiced in the region, needs to be reprioritized and diverse tree, crop, and horticulture combinations need to be assessed to meet the target of forest cover and support incomes.

While it is inevitable that out-migration from the district will resume as and when economic activities at urban and industrial clusters reopen, the pandemic has exposed the fault lines of inequality and the nature of development that pushes distressed migration.

# 5 Conclusion

**The widening hiatus**

The deep dive study of the energy industry in Betul suggests that despite the tremendous potential for development and employment generation in the region, the gains made have been limited. The benefits remained confined to the Sarni Municipality (falls in the Ghodadongri tahsil) leading to huge inter tahsil and rural–urban disparities. No other town emerged after Sarni, and the one that did, had to be de-classified in the next Census as it did not satisfy the demographic and economic criteria. The economic benefits and the benefit of the infrastructure and municipal services provided by the energy industry in its jurisdiction did not reach its rural neighbourhood and the hiatus with other tahsils too increased.

**Addressing vulnerabilities**

The district is one of the worst affected in the country by the COVID-19 lockdown as it suffered from reverse migration, indicating its low employment inventory. The rapidly declining main workforce (those having worked for six months or more in the preceding year) is replaced by an increasing percentage of marginal workers. The district ranks low on the per capita income ranking within the State. With 40% of its economy based on the primary sector, the agrarian economy is vulnerable to climate change as it is beginning to face water scarcity. Coal has created its own pocket of affluence, benefitting a handful of communities, especially those who came from outside seeking jobs and business opportunities. A few downstream communities did benefit economically but not after bearing their share of the environmental cost.

Continuous mining has put communities, particularly the indigenous, at risk. The place no longer habitable or arable, agricultural productivity has declined, pastures have shrunk, and they face acute environmental degradation and water scarcity. Now only able to do subsistence farming, these communities choose between migrating out or join the energy industry in jobs which are increasingly temporary, contractual, and informal in nature.

This study emphasizes on the changing labour market around the industry and the emergence of informality. This has wider ramifications as labour issues are as much social issues as they are economic. Besides the state, the public sector units also provided formal jobs with good pay, entitlement, social security benefits, and rights at workplace. It is these public sector employees that spurred a whole set of induced jobs. The public sector jobs met aspirations of those employed formally, opened opportunities for the socio-economically marginalized communities of SCs, STs, and OBCs (even though the nature of integration of these groups has been questioned in the study). The workforce distribution is such that the bulk of workers are in the non-executive groups, 48% of which comprises the weaker sections.

Informalization was brought to bring down the cost and to meet the industry's revenue and production targets. But it brought with it inequality and marginalization of contract workers. Even though informal jobs are poorly paid and precarious, they are taken up to avoid unemployment. This race to the bottom has damaging impact on the labour market of the future. In the rural households of Ghodadongri,

less than 1% households are employed in the public sector, 60% households depend on casual labour for income, and 28% depend upon cultivation. The highest earning member in 90% of the households have monthly income less than INR 5000, whereas only 5% households have between INR 5000 and 10,000 and another 5% above 10,000[1]. People need jobs and decent job opportunities remain a challenge in the district. Inequality, particularly income inequality within the industry and the intra district inequality, needs to take a central place in any discussion around a transition.

**Improving scope for MSMEs**

It is the state and the energy industry that offered large scale employment in the district. Infrastructural development was uneven and remained confined to the headquarter and in the vicinity of the energy industry. Inadequate infrastructure is one of the reasons why the district could not attract investments.

A pre-requisite to attract investment is the availability of necessary and supporting infrastructure in transportation, rural and feeder roads, electricity infrastructure, storage, sewerages, drinking water, banking services, institutions that promote research and training amongst others.

The district is dotted with micro-enterprises around readymade garments, repair and services, wooden furniture. To boost opportunities for employment and entrepreneurship, promoting small and micro-enterprises is a way forward. Enterprises, such as those around agriculture have immense potentialities for generating employment and strengthening the backward and forward linkages. Likewise establishing linkages to the national and international markets through value chains, will bring about economic diversification in the region.

The case study has pointed out to the disruptions in Sarni triggered by closure of coal mines. Particularly since the pandemic, local traders, and transporters, have been opposing any trade activity that comes to Sarni from outside the region. Building up of such hostility needs to be addressed to prevent investments from fleeing the place.

1 Socio-Economic Caste Census, 2011

**Strengthening agriculture**

An overwhelming 78% of the main workforce is engaged in agriculture and even within this agricultural labour hold a dominant share at 45.5%. Cultivators with a share of 32% have a sizeable share of small and marginal farmers (those with less than 2 ha of land) at 62% holding about 25% of land. The situation worsened when at the peak of the pandemic, the district received a high number of returnees (district identified as atma nirbhar district by the Central Government on the basis of the high number of returnees). That agriculture will stay, and a dramatic leap from agriculture to industry cannot be expected, improvements in agrarian livelihood needs to be made.

In the face of water scarcity and food insecurity gripping the region, this study recommends shift from cash crop to food crop, promoting the once popularly grown indigenous millet- kodo-kutki (also known for its high nutrient content, drought tolerance, and ability to grow on marginal soils) and taking the millet up in the value chain to reach the market. It is one way of promoting resilience in agriculture. The study recommends promoting micro-irrigation as opposed to tube well irrigation, improving transport and storage infrastructure, encouraging low cost decentralized renewable energy solutions across farming operations from irrigation to post-harvest storage, transportation, and to processing.

Opportunities also lie in repurposing abandoned mines for grazing and pastures, identifying scope for apiculture. Likewise, regeneration of native species and medicinal plants (particularly the NTFP such as *kullu, musli, chironji*) as part of restoring and reviving agroforestry, identifying and establishing effective value chain at regional and national levels, directly by farmers and their organizations will help in diversifying rural incomes, restoring biodiversity, and forest replantation.

**Improving social infrastructure**

Though the public sector undertakings (Coal India Limited and MPPGCL) provided hospital, school, township, roads etc., it was, however, limited for the

direct benefit of its employees and for its own use. People need infrastructure, educational institutions, health care facilities to be better able to cope with any transition. Youth in Sarni mentioned the need for providing more opportunities for technical skills, the need to address the information gap on education and employment opportunities, the need for institutional support in promoting their mobility amongst others. The communities complained of the continuous exposure to fly ash, coal dust emission, and the particularly high prevalence of cardio-vascular, respiratory, musco-skeletal disorders amongst the workers. While the coalfield hospital can be accessed only by its regular employees, the rest of the people travel to the district hospital at Betul. Since the benefits from the industry were skewed, re-investing in long-term institutions such as technical and vocational institutions, schools, in particular high schools, decently bedded hospitals, and related medical infrastructure will not only help create jobs around the ecosystems of these institutions but also address inequality.

**Convergence of efforts of state and public sectors**

A comprehensive approach in coordinating and converging works under the District Mineral Fund, the MPGATSVA[2], corporate social responsibility of the public sector undertakings (all of which is contributed by the coalfield and adds up to INR ~35 crores per annum) in rebuilding the area needs to be strengthened. Without this, efforts taken up by the public sector could result in an overlap or be isolated from works under DMF.

While DMF has great potential to address the equity and justice concerns, care needs to be taken to identify works which are ecologically viable. Even if a part of it is used for making available water for agricultural purposes, it should not exacerbate the existing groundwater situation in the region. Envisaging the setting up of a Centre for Excellence for mining affected area under the DMF is a step in the right direction.

**Understanding local debates and contestations**

If transition is to address some of the long-term difficulties in the region either created by the energy industry or as foreseen by its closure then it is important to engage with the local constituency, i.e., the community, the workers, the traders, the local media, the local political leadership, the local bureaucracy, and the industry. While the risk to the livelihood of the indigenous Korku and Gond communities remains if coal mining continues, trade unions are not willing to discuss low carbon pathways as it risks formal jobs. Debates around the future of the place they envisage and their lack of willingness to reduce dependencies on coal needs cannot be overlooked. Sarni Municipality faces challenge in preparing a Master Plan for its wards as its population is decreasing. It needs to find newer financial resources and identify newer services that are sustainable. A *Udyog Bachao Nagar Bachao* forum has been formed locally that presses its demand for opening more mines, setting up new units of power plant, carving out Sarni as a separate tahsil and vehemently opposes traders from outside. Given the demand on district administration due to unemployment and now of the returnees during the pandemic, it is difficult to see how the district will forego the one-third non-tax revenue from coal royalty. Moving away from coal does not find any place in the political manifesto of any political party in the region nor in any local media. Broader issues of repurposing the public sector units, given the kinds of socio-economic contributions they have made and state ownership of natural resources, forms the larger debate.

Not recognizing and responding to these issues may inhibit efforts to a low carbon transition in the region.



2 Madhya Pradesh Gramin Avsanrachna Tatha Sadak Vikas Adhiniyam (MP Rural and Road Development Act)

# 6 Way forward

The way forward for the district lies in a tailor-made approach that focusses not only on rural incomes but enhances opportunities that reduce vulnerabilities and addresses the ecosystem through a low carbon pathway. Moreover, the way forward should find acceptability by those who will implement it. The discussion in this section is limited to only those interventions that were brought up by stakeholders.

As stated earlier, a convergence of state and public sector efforts is needed in planning and mobilizing resources. Identified resources are particularly receipts from coal mining under DMF, MPGATSVA, CSR and Transit fee. Besides, convergence can also be found in some of the already implemented programme of the centre and the state implemented in the district such as the public employment programme MGNREGA[1], livelihood promotion programme under NRLM[2] amongst others.

## Agriculture

### *Millets*

*Revival of indigenous millets:* The once popular millets, *kodo kutki, balhaar and sawa*, now occupy a marginal share of 0.2% of the net sown area in the district. There already exists a great knowledge bank with Gonds, the indigenous tribe, in cultivating these crops. Besides high in nutrition, these millets are rainfed and can grow on marginal soils. Revival of these crops will enhance food security. The Government of Madhya Pradesh has taken initiatives in Dindori and Mandla districts to revive minor millets.

*Promoting agro-processing around millets:* As millets did not find adequate procurement under the minimum support price, hence the farmers switched to crops such as sugarcane, paddy, soyabean, which assured them of income.

If enterprises in agro processing of millets are set up, besides providing an income security to farmers, it will provide a market for the crop. Farmers and their organisation, particularly the Farmer Producer Organisations (promoted by Department of Agriculture, Cooperation and Farmers Welfare, Ministry of Agriculture and Farmers Welfare), can play a significant role all through the value chain, from production to marketing of the final produce.

### *Apiculture*

Given that the area lies in the rich Satpura Melghat forest belt, apiculture has immense potential to be tapped in the region. Bee keeping helps in promote natural pollination, apart from providing an income support to the local people. Reclaimed and abandoned mine areas can be re-purposed for apiculture.

### *Strengthening supply chain in perishables*

With the depopulation of Sarni town, the demand for perishables (vegetables, fruits, and milk) which were being supplied by the downstream villages, has fallen. With no other market access and no storage infrastructure, farmers have been forced to sell their produce at lower rates and have no option but to destroy the surplus. Facilitating collection of produce, warehousing, cold storages, transport infrastructure including refrigerated transport will help the farmers in accessing more markets.

1 Mahatma Gandhi National Rural Employment Guarantee Act
2 National Rural Livelihoods Mission

*Promoting micro-irrigation*

Water aquifers in the region have depleted due to various reasons. Cultivation of water intensive crops cultivated, along with mining in the region, have caused such depletion. The basaltic nature of the geology poses a limitation on the depth of tube-wells and borewells. The financial resources from mining can complement the implementation of micro irrigation under the National Mission on Sustainable Agriculture of the Ministry of Agriculture.

*Agro-forestry*

The region has traditionally practiced agro-forestry. Some of these non-timber forest produces are of high value in the international market. Agro forestry needs to be reprioritized and revival of the native species and medicinal plants such as kullu, musli, chironjee, bamboo (*musli* is now an endangered medicinal plants) will help in reviving biodiversity and supplement incomes. Identifying sustainable linkages in pharmaceutical supply chain, through cooperative of producers is suggested.

*Remediation and reclamation of abandoned mines*

A Supreme Court Order [WP (Civil) No(s) 114/2014 *in Common Cause Vs Union of India and others*] has made it compulsory for mining companies to re-grass the mined-out area suitable for the growth of flora and fauna. The order emphasizes land restoration to a condition, which is fit for growth of fodder, flora, and fauna. Careful assessment of the abandoned mines for repurposing them for grazing land and pastures, identifying scope for secondary agriculture activities such as apiculture, can be considered.

*Strengthening infrastructure*

Infrastructure across the district needs to be strengthened. Roads including feeder roads are needed to facilitate backward and forward linkages, especially for the small and marginal farmers. From better access to farm inputs to access to alternate market for their produce, the role of road connectivity is undeniable. Access to reliable and quality electricity, particularly through renewable source of electricity in farm operations, as also promoted by the Pradhan Mantri-Kisan Urja Suraksha evam Utthan (PM-KUSUM), will go a long way in diversifying the economy of the place.

*MGNREGA for low carbon infrastructure and carbon sinks*

The public employment guarantee programme, MGNREGA (Mahatma Gandhi National Rural Employment Guarantee Act) has high potential in taking up the works discussed. Work on re-planting the indigenous species, re-grassing the abandoned mines are steps to creating carbon sinks. Works under drought proofing through developing on-farm micro-irrigation network, rainwater harvesting, water shed development will build up sustainable assets in the area.

**Skill Building**

*Re-modelling vocational training centre*

The vocational training centre of the coalfield rolls out training to build capacities of its existing workforce in the industry. Under the corporate social responsibility programme, it provides training to the local youth on welding, plumbing, nursing, stitching amongst others. As two new mines have been proposed, there is an immense demand and uptake for training as contract workers in mining. Amongst the courses offered in the non-mining sector, nursing was popular as there are high employability chances within the hospitals of WCL.

However, in the proposed mines, WCL proposes to deploy 'continuous miners' machinery for mass production. As a result, there will be fewer jobs in the future (fewer jobs in the new mines due to machinery and in the old ones due to gradual mineral exhaustion), and the industry will not be able to respond to the job expectations in the region.

As the public sector undertaking plans to diversify and tap into renewables in the future, it is suggested that the industry works in close partnership with training institutions of the private sector in identifying skills of the future, particularly those in renewables and energy efficiency. The industry's vocational training centre is well poised to build a cadre of trained skilled

workforce to meet the future demands of the industry and of the market as well besides facilitating upward mobility of its workers.

*Promoting MSMEs*

Simultaneous effort in ramping up of opportunities in MSMEs in green products and services and promoting green entrepreneurship is required. A combination of micro, small and medium enterprises will better prepare the local economy to face the current slump. Encouraging local procurement from these enterprises, particularly by the industry, will promote innovation, employment generation, and facilitate their scaling up.

*Adjustments in education and training*

The challenge of supplying a skilled workforce in the district comes from an inadequate number of those with higher education qualification. In the rural areas of the district, with 58% literacy, less than 8% of the literates have completed secondary level, those completed higher secondary levels are about 5%, and less than 3% have completed graduation or higher levels. This corresponds to the kinds of incomes seen at the district rural level. With 58% rural households in the district depending on manual casual labour and in 89% of all the rural households, the highest earning member earns less than INR 5,000 per month.

The urban areas are relatively better than the rural. The urban areas of the district have close to 14% of the literates who have completed secondary level, 14% higher secondary levels and 16% have completed graduation or higher levels. With 16% urban households in the district earning monthly wages, the remaining depend on daily, weekly, or irregular wages.

The challenges in the region are multi fold. On the one hand, a lower level of educational attainment, especially not able to complete secondary level, acts as a barrier in accessing technical and vocational courses in polytechnics, ITIs (Industrial Training Institutes) or any other vocational training centres. On the other hand, focus group discussion with youth suggests that, those who have completed high levels of education are unemployed, indicating the skill mismatch.

Considering the anticipated skills of the future, systemic changes to existing education and training infrastructure is required. Identifying relevant training programmes, revising course curriculum, bringing digital education, emphasising on components of science, technology, engineering, mathematics (STEM) skills, amongst others need to be considered. The vocational training centre of the industry, the ITIs (Industrial Training Institutes), polytechnics, are instrumental in imparting employable skills.

Skill intervention is an important component of any transition. It requires the convergence of efforts between the private, the district administration and the public sector, to meet the demand for employment as well as the demand for development of the region.