

## Original article

## Living with coal in India: A temporal study of livelihood changes

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## ABSTRACT

This article asks what it is like for the rural poor to live with coal over time as mines expand and agriculture and forest-dependent ways of living inevitably become more restricted. Research on the expansion of open pit coal mining in India shows a widespread inability to appropriately compensate the rural poor for lost land and access to common property resources. Yet it is simultaneously clear that the growth of coal extraction over time ensures increased community dependence on mainly informal, coal-based livelihoods. What then happens over the long-term for people who live in and around the coalfields? Drawing on evidence from 2011 to 2022, this article explores longer term changes for mine-affected people next to major coal mines in Telangana state, India. Specifically, it examines a) the acquisition of forest and agricultural lands for the expanding mines, b) the operating mines and their environmental implications, but also improved job opportunities, and c) mine closure as an opportunity to rehabilitate the landscape and return the land for alternative community uses post mining. The results add to the understanding of the long-term changes that large-scale mining brings to rural communities, and the challenges to a just transition once coal mining inevitably comes to an end.

## 1. Introduction

This article asks what it is like to live with large-scale mining over the long term in Global South settings characterised by informal and often overlapping land uses, uneven implementation of regulatory frameworks, and high dependency on informal jobs. The approach here is living *with* rather than living *from* mining given the paucity of direct and indirect employment in this sector compared to pre-existing agricultural and forest-based livelihoods. The intent is to explore what it is like to live with mines between displacement and the possibilities of (mainly informal) coal sector jobs as agricultural communities slowly become part of the coal economy. The article traverses challenges faced by the villagers in an Indian coalfield, and the many uncertain opportunities and risks that come with this key national energy source which poses a threat to the global climate. While not competitive compared especially to solar power, coal energy holds firm control over India's national electricity production and, increasingly, the aspirations of many rural households that are able to reap benefits from the economic expansion associated with mining operations.

We use the coal town Manuguru in Telangana state as an entry point when seeking an improved understanding of the longer term experiences

of people whose lives have become intertwined with coal. Via data collection in 2011 and 2022 we outline how people live with past injustices of forced displacement while having to make do mainly with insecure, informal jobs related to coal. As this former agricultural town and its rural hinterland is slowly transformed into a major energy producer we are however also able to note a range of other experiences which include educational attainments leading to upward social mobility, and *Adivasi* households able to secure middle class lifestyles based on the much-coveted public sector jobs received as compensation for displacement. Impoverishment due to forced displacement thus exists side-by-side with otherwise inconceivable generational improvements for those able to secure public sector jobs. Exploring what it is like to live with coal in this manner requires a multi-pronged approach able to capture experiences by different groups and individuals.

Following an overview of the literature on communities and coal, a discussion on methods and case study background is presented. Evidence across three sections, of the experience of communities on mine expansions, operating mines, and preparations for mine closure, is then presented. Finally, we discuss the future of livelihoods in mining-affected areas of India based on the possibilities to prepare rural lives without coal when mining inevitably comes to an end.

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## 2. Living with coal: global south and Indian coalfield community experiences

The present study of communities living with coal draws on a wide body of research on how large-scale mining in Global South settings affects rural communities dependent on land-based livelihoods (Ali, 2009; Bebbington et al., 2018; Lahiri-Dutt, 2014). The affected groups typically comprise settled and relatively self-sufficient farmers, forest-dwellers and pastoral groups where the latter two groups tend to depend on common lands. Such agrarian societies are typically not in privileged positions to voice their demands or receive benefits from mining projects, but may in some cases mobilise powerful support or depend on the implementation of protective legislation or policies. Within this extensive body of research lies a wealth of in-depth case studies that capture nuanced experiences situated in time and space. Less common in the literature is, however, the ability to capture long-term trajectories of change.

Most severe are the effects on indigenous groups as mining expands into previously untouched regions, often fuelled by transnational investments made by companies from the West (Ali, 2009; Connell and Howitt, 1991; Gilberthorpe and Hilson, 2012; Padel and Das, 2010). Key themes include land loss, including the loss of access to commons and the possibility as well as suitability of different forms of compensation (Bebbington et al., 2008; Hilson and Banchirigah, 2009; Kativu and Oskarsson, 2021; Lillywhite et al., 2015; Maconachie and Hilson, 2013). Research has further examined the possibilities to gain formal and informal work in the sector (Lahiri-Dutt, 2018; Nayak, 2022; Noy, 2019; Spiegel, 2012), with specific gendered effects (Lahiri-Dutt, 2007; Nayak, 2020; Serwajja and Mukwaya, 2020). Yet other research with more indirect implications for rural livelihoods engages with the conditions of environmental management (Ali, 2009; Beynon et al., 2000), including studies of mine closure and the future of post-mining landscapes (Misra, 2018; Toumbourou et al., 2020).

Open pit coal mining dramatically rearranges lives and lifeworlds in coalfield areas as many are forced away from their lands. Meanwhile, others may choose to migrate to the coalfields in search of jobs. Most people from both groups may, in Global South settings with vast informal economies, have to remain in the shadows of the coal pits surviving on any marginal living that may be available to them as farmers, herders, coal scavengers, or as daily wage workers. Under such conditions research should capture multiplicities, uncertainty, and the importance of individual and collective agency to get by in uncertain settings, which to some may offer better opportunities than previous agrarian livelihoods, but to many others leads to uncertainty and poverty.

Open pit mining uses more land compared to underground mining. Not only does it prevent other activities to carry on at surface level alongside underground mining, open pit mining also requires significantly more land, potentially more than half of the total area used, to store waste (Toumbourou et al., 2020). It is for this reason that mining, along with similar research on for example large dams, industrial projects and other activities part of the 'global land grab' of recent decades (Borras Jr et al., 2019; Wolford et al., 2013), have tended to focus on land relations and the possibilities to ensure appropriate compensation due to displacement. While the term land grabbing has been less commonly used in research on India (Oskarsson et al., 2019) thousands of smaller 'land wars' (Levien, 2013) have animated a wide body of research intent on understanding the conditions of land dispossession, the possibilities for different affected groups to claim just compensation, or completely refuse development-induced displacement. In spite of decades of movement protest, present practice remains intent on offering cash compensation and, at times, a job as compensation in spite of research having established that this is inappropriate (Khagram, 2004).

Apart from displacement common complaints involve depleting groundwater, forest cover loss (Bebbington et al., 2018), dust from the mines and from processing units, and the transport of local produce, and

damage to houses located several kilometres away from the mine sites as a result of frequent blasts. Within India a large body of work has engaged with land loss and social mobilization as the mining sector has expanded rapidly via open pit mines in recent decades (Herbert and Lahiri-Dutt, 2004; Lahiri-Dutt et al., 2012; Oskarsson, 2018; Reddy and Mishra, 2010). The result has been some amount of compensation for land losers, but typically there has been a lack of implementation as a result of bureaucratic procedures and inaction. Research has also analysed livelihood changes from mines beyond land loss and displacement to mining-related jobs (Ghosh, 2016; Noy, 2019), but there is at present quite limited research in India on mine closure and community life once mining operations cease (Bhushan et al., 2020; Mishra, 2018).

The constant expansions, contestations, and closures at any Indian coalfield (Oskarsson et al., 2019) makes it a useful unit of research for the study of coal's many different effects on livelihoods. This article takes a long-term view on livelihood change from (a) the establishment of mines which takes away land from farmers, herders, and many others in exchange for mainly cash compensation, (b) the operating mine which degrades the environment, but also offers benefits in terms of jobs, and (c) mine closure in which the land can potentially be returned to the original land losers, but is in reality handed over to the state forest department for plantations with uncertain local livelihood outcomes. In this manner, one may begin to understand the livelihood effects of open pit mining expansions in the Global South in recent decades.

The initial years of mine planning, establishment, and operations lead to widespread displacement and dispossession with demands for improved compensation that would enable landowners, common property users, agricultural workers, and educated and manual labourers across groups, identities, classes, and ethnicities to find alternative livelihoods or benefit from the coal economy now set up in their areas of living (Lahiri-Dutt, 2016; Oskarsson et al., 2019). Demands for compensation are made in a multitude of creative ways, including newspaper coverage, court cases, direct lobbying with decision-makers, mining companies, street protests, and other forms of negotiation, contestation, and direct protests (Oskarsson, 2015). Unfulfilled community demands may lead to unrest and even violence. Most communities are encouraged to oppose early on since changes at a later stage can be close to impossible for already operating mines.

Compensation packages are slowly finalised and various avenues of protest become exhausted. As the mine becomes a fait accompli, no longer possible to negotiate over, resist, or oppose, economic and physical landscape changes open up a new phase where community lives become intertwined with the expanding coal economy. Land-demanding open pit mining is the norm leading to swift and widespread landscape changes. Continued expansions over the next several decades may not offer apparent benefits, but some amount of both formal and informal jobs in the sector open up that also generate significant inward migration. A key aspiration is to secure a permanent public sector job that would elevate a poor rural household to the middle class. Meanwhile, other potential sectors, especially agriculture, are rendered unviable either due to direct land dispossession or environmental crises like groundwater depletion or pollution. While the availability of lucrative jobs and an overall expanded cash-based local economy is an opportunity for some, typically those with formal education, it also removes jobs in agriculture and forestry, and further erodes existing community relations.

Coal mines close usually after several decades of operation. In India closures occur not due to climate change or local community protests, but when the remaining coal is too expensive to excavate compared to other domestic deposits (Bhushan et al., 2020). At this final stage the land can be returned to the local communities, but it requires significant work and funds to restore the landscape, raise new forests, and clear and stabilise the waste-dump areas (Toumbourou et al., 2020). Other possibilities also exist like opening up the land for the purpose of new industrial investments. Since land is scarce in India the latter option often appears more plausible. A pertinent question arises regarding the fate of

the local infrastructure like railway, water connections, and schools that were supported by the mining company during operation. A careful and comprehensive mine closure which attempts to remediate both mined-out lands and coal-dependent communities is yet to be carried out in India in spite of various attempts, initiatives, and legislative demands (Oskarsson and Chhotray, 2021).

Overall, the question of community participation as well as planning for jobs and livelihoods after mining, restoration of jobs, rehabilitation of socio-economic conditions, and prevention of distress outmigration remains largely unaddressed. There is little focus on ensuring that the poor and historically marginalised—such as women, indigenous groups, racial and ethnic minorities with relatively less political and social capital—are included in planning processes, from mine planning to operational practices, and on to mine closure and landscape restoration. This lack of focus only exacerbates the adverse impacts of mining and prevents mine closure procedures sensitive to local context and ecologies.

### 2.1. Research design and methods

Manuguru serves as a qualitative, temporal case study where the authors collected data set ten years apart, in 2011 and 2022, to analyse livelihood transformations in a location where coal is a major influencing factor. The research design brings together data collection from two discrete time periods to seek ongoing understandings of livelihoods change related to large-scale coal mining. As such, the intention is not to be strictly comparative but rather to explore qualitatively how groups of people engage with and relate to coal at different points in time: in 2011 when open pit coal mining was at a quite early stage, and later in 2022 once it had become firmly established as the main economic sector in the area.

Fieldwork was conducted around Manuguru’s operating mines in 2011 and 2022 (see Table 1). Fieldwork carried out in 2011–2012 and 2022 each consisted of repeat visits for a total of 1.5 months, or in total 3 months of time. The 2011 fieldwork was carried out to understand livelihood effects from open pit coal mining. It was thus not designed as comparative and longitudinal. As part of the fieldwork, a total of 76 livelihood questionnaires were completed in four villages (New Kondapuram, Padmagudem, Shantinagar and Eggadigudem). The 2022 updated fieldwork, however, matched villages (to the extent that the villages had not been displaced) and groups of people of the 2011 fieldwork in order to ensure capturing of similar voices. Most of the new villages added to the 2022 survey are newly established, and created by the mining-displaced residents themselves in Manuguru. The only village covered in the 2022 survey which is not yet affected by mining is the Adivasi village of Bugga as a complementary village in the forest (surveyed only in 2022).

**Table 1**  
Manuguru coal mines.

	Prakasham Khani opencast	Manuguru opencast	Kondapuram underground
Starting year	2021	2017	2015
Planned end	2030	2026	2036
Land acquisition	2215 ha forest land, 187 ha non-forest land	595 ha agricultural land	–
Present land use	2152 ha	629 ha	6 ha
Maximum land use	2402 ha	668 ha	6 ha
Rate of production	9.75 million tons per year	1.8 million tons per year	0.0006 million tons per year
Post-mining land use	Forest plantation 1516 ha, water body 770 ha, public use 116 ha	Forest plantation 430 ha	–

Sources: EPTRI (2019, 2020) and SCCL (2022a, 2022d, 2022e).

Methods employed by the research team consisted of semi-structured individual and group interviews, observations, and a livelihood survey. In this research, like for all qualitative research, the direct and personal interactions of the researchers with research respondents have various effects on outcomes which are unavoidable but need to be engaged with and addressed by reflecting on the roles of the researchers and continuously seeking alternative responses and explanations. One additional way to reduce researcher influence on fieldwork responses and outcomes is to triangulate data collection. In this research data was triangulated from personal interviews and focus group discussions, a livelihoods survey and a close reading of planning documents. Triangulation can naturally only work among people still residing in the study area, and there is a risk that some have migrated to other locations due to displacement and loss of livelihoods, alternatively to pursue other work or education in this region with many upwardly mobile households. The authors pursued questions of migration and believe that outward migration remains limited in the area. The effect of non-responses due to migration, however, remains a factor in understanding responses.

In 2011, the 25 residents surveyed in Srirangapuram (now part of Shantinagar) were all Dalits; while the 20 respondents in Kondapuram belonged to the Koya scheduled tribe (the two backward caste males surveyed were married to Koya women). The residents in Eggadigudem belonged to OBC, while Padmagudem was primarily an Adivasi village, with some OBC residents. In 2022, the livelihood survey was run on 70 individuals residing in eight villages (New Mallepalli, New Kondapuram, Kommugudem, Shantinagar, New Padmagudem, Madinanagar, Bugga and Aiylapurum). 26 of these individuals were Dalits, 27 were Adivasi and the remaining 17 belonged to the OBC category. 58 of the respondents were men, and 12 were women.

Attempts were made in 2022 to contact the families part of the 2011 survey. Out of the 25 individuals in Shantinagar surveyed in 2011, we surveyed 10. In addition, the survey included the wives of two more of the original respondents who had died in the interim. Fieldwork in 2011 had covered old Padmagudem and Kondapuram. The 2022 survey covered residents who had originally lived in these villages. The STs residing in Padmagudem have since been rehabilitated in New Padmagudem (covered in the 2022 survey). The 2022 survey attempted to trace the livelihood trajectories of populations living near the expanding mines. It, however, does not capture all the families in the original study.

Apart from the livelihood surveys, focus group discussions were conducted in each of the 8 villages surveyed in 2011. These discussions were open-ended with the intention of assessing views about SCCL’s displacement and rehabilitation policies. 6 semi-structured interviews were also conducted in 3 of the villages (New Mallepalli, Madinanagar, New Padmagudem). The research team also analysed planning documents to complement the responses emerging from the Manuguru area. The richness of the material is not only due to the sociocultural diversity of the peoples of Manuguru’s villages,<sup>1</sup> but also due to the multiple open pit and underground coal mines on agricultural and forested lands. It thus provides a broad understanding of variegated outcomes in relation to coal expansion in a location with few previous industrial activities.

Common ethical practice in social science research is to keep respondents and study villages anonymous. While we in this article retain the anonymity of individual respondents to protect them from potential, negative consequences, it became clear in our interactions in the mining-affected villages that most of them actively wanted to be seen. Government recognition of the new villages created after displacement has in many places been lacking since displaced Dalit and OBC households

<sup>1</sup> Since Manuguru coal mines and the displaced villages are well known in public planning documents the authors chose to retain the original village names in this study. In many cases villagers struggle to have their rehabilitated villages officially recognised to ensure they can avail of various social services and public infrastructure.

had to build houses and create new villages entirely on their own without either government or mining company support. While people can build houses on their own, securing electricity and water provision is highly challenging without support. Recognition of all new villages (named “New”) in our research might thus potentially help villagers being seen. Villages named “Old” typically no longer exist since these have been displaced by the mines.

## 2.2. Case study

Singareni Collieries Company Limited (SCCL), a public sector company jointly owned by the central government and the Government of Telangana, has a monopoly on mining the coal belt along the Godavari river in Telangana state. The company owns 45 mines in total that produced 65 million tons of coal in the 2021–2022 fiscal year (SCCL, 2022f). It is, however, significantly smaller than many of the other subsidiaries of national giant Coal India for example Central or Eastern Coalfields Limited. Many coal mines in Telangana, including those in Manuguru, lie in the so-called Scheduled Areas where land has constitutionally been reserved for the benefit of the scheduled tribes (STs), or Adivasis since, colonial times to protect them against exploitation (Balagopal, 2007). There is, however, a lack of actual implementation of Adivasi land rights, and large-scale industrial, forestry, and individual non-Adivasi farmers have usurped entire tracts of land (Ibid.). Most of the actual land, especially high-quality agricultural land, is controlled by Hindu and Muslim farmers from other areas. In an attempt to understand how coal extraction shapes community life, the analysis becomes embroiled in a politically charged history not only shaped by present coal extraction but strongly influenced by colonial and post-colonial political economy structures.

Coal mining in Manuguru commenced with underground extraction in 1974. Like elsewhere across India open pit mining became the norm from the 1980s onwards. In 2004 the first large open pit mine was proposed in Manuguru (after several expansions renamed Prakasham Khani in 2020), which started in 2008, would have displaced 6000 households over about 2600 hectares of land, but public protests helped contain the displacement. At the time of the first fieldwork the mine was expanding into nearby forest lands inhabited by Adivasi and Dalit households. In addition, a new open pit mine had been approved and the acquisition of agricultural land next to the Godavari river was underway. The Manuguru mining expansions at that time were part of a widespread effort to increase coal mining across the state with 16,000 hectares land proposed for coal mining by the SCCL.

In 2022 the two open pit mines continued to operate and expand together with an older, underground mine operated by a private contractor, SMS Mining Company Private Limited. The Bhadradi Thermal Power Station (BTPS),<sup>2</sup> a solar power plant, and a geothermal experimental plant came up immediately beside the mines. Supporting this energy infrastructure is a new railway line and the diversion of a local rivulet that is contributing to the dramatically changed landscape. Manuguru has in this manner transformed into an energy hub, but coal is at present not expanding its land use like earlier. The coal mines have, however, drastically increased their annual output rates within existing boundaries indicating early mine closures—the two open pit mines are slated to close in 2026 and 2030. While plans for more mining is not known at the time of writing, new mines appear likely in support of the recently constructed BTPS which will remain operational for the next 30 years based on locally available coal. Thus, the future direction of coal in Manuguru remains unclear.

Land and other displacement compensation by SCCL is based on the highest of Coal India’s Resettlement and Rehabilitation Policy, 2008, the National policy in the Right to Fair Compensation and Transparency in

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

Land Acquisition, Rehabilitation and Resettlement Act, 2013, and the state-level policy of Telangana state, the Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement (Telangana Amendment) Act, 2016. Since Manuguru is part of the Scheduled Areas it is virtually only Adivasis who can be owners of land, and thus be compensated according to the policies. During fieldwork we did, however, encounter a few households who had resided in the area since long and used the law prior to 1969 which allowed non-Adivasis to also register land ownership. Non-Adivasis could thus in some cases receive monetary compensation but never new land or new houses since such ownership is prevented in the area according to present day laws. And since the money offered for land around Manuguru is lower than regular land outside of the Scheduled Areas the sums received are not adequate for this group of farmers who often instead entered into negotiations with Adivasis in the area to build a house on land owned by others, and potentially also lease farming lands. Resettled houses of non-Adivasis did not get support to access public infrastructure like water and electricity.

The other main form of compensation displaced households seek is the possibility to gain a mining company job. In 2011 such possibilities were unknown in the area also for land owning Adivasis, but in 2022 the possibility to gain a job has emerged as a key demand. Since SCCL unlike many of the other subsidiaries in Coal India continues to mine on their own rather than outsource operations, a job in the public sector holds great attraction with job security virtually guaranteed for life. As we explore below, this possibility only falling to Adivasi households is a source of enormous tension in the area. Other groups can at best hope for private sector service provider jobs which potentially offer similar salaries but never come with the same job security.

## 3. Mine expansions: struggles over land and livelihood compensation

Flat and fertile lands along the Godavari River like those around Manuguru town have since several generations been occupied by settler farmers of mainly caste Hindu background. Much before coal arrived in the mid-1970s virtually all fertile land had thus ended up in non-*adivasi* hands in spite of the strong land protection on paper. Like in similar locations across central-eastern India the *adivasis* instead became agricultural workers, casual labourers or possibly upland farmers or forest product collectors in the remaining upland forest tracts which were not seen as productive enough to be of interest to dominant caste groups (Balagopal, 2007; Oskarsson, 2018; Rao et al., 2006). The effects of the coal mining expansion in Manuguru over the past decade is thus only to a limited extent about *adivasi* dispossession since this process was completed before the coal industry arrived.

As a result of the land grab of farm lands by caste Hindus, and related long-term migration to Manuguru, the coal-affected groups are highly varied and include the so called other backward classes (OBC<sup>3</sup>), Dalits and *adivasis*. The *adivasis* have by far better rights in policy documents whereas the OBC groups are historically the better off with ability to mobilise own support from for example political parties or by going to court. The Dalits meanwhile end up in between, most often without land titles, and with neither government support nor own strong support base other than from some civil society organisations. In 2011, the OBC households occupied, though typically did not own, the best agricultural fields next to the Godavari River.<sup>4</sup> In upland forests, Dalit households

<sup>3</sup> Other Backward Castes is a collective term used officially for low to middle caste groups not including Dalits or *adivasis*. In Telangana state there are both Hindu and Muslim groups included among OBCs.

<sup>4</sup> The state land rights legislation prevents non-*adivasi* households from owning land in the area. There was, however, a possibility for non-*adivasis* to gain an exemption from this ban before 1969; thus, some landowners to date are non-*adivasis*.

cultivated land without title deeds making them vulnerable to displacement with little or no compensation. There were also Dalits in agricultural villages without land titles. Some Adivasis still lived in separate villages in the forests, but most lived among the mixed-caste groups in the villages under study (Fig. 1).

The 2011 fieldwork showed how land compensation should work when local authorities ensured new housing and farm land to the affected Adivasis when Kondapuram village had been relocated from the forests to the agricultural plains during early mine expansions. However, new mining proposed in the conversion of underground mines to the Manuguru OC open pit mine meant fresh displacement for the same people. The land allotted as compensation from displacement to New Kondapuram village households was therefore taken away in 2012, and the villagers were left with no jobs. In 2022 interviews with villagers asserted that this occurred because they never received legal land deeds as part of the displacement from the forest, and therefore could be evicted the second time without new land or jobs.

From 2011 to 2022 four more mixed-caste villages were displaced as a result of the Manuguru OC mine. In 2011 it was expected that 652 households would be displaced. Of these 56 households would lose both land and houses, 89 only land and 507 only their houses.<sup>5</sup> The affected organised frequent protests in and around Manuguru to halt the displacement drive, or at least receive compensation. Villagers invited journalists to cover the protests, filed court cases, and sought political intervention. Unfortunately, all attempts failed. Meagre cash compensation was provided only to those with land titles. In practice, this compensation was shared across several households since all private land had an Adivasi owner on paper but an unofficial OBC land user. How this happened seemed to be based on a case-by-case mechanism as individuals bargained. It is clear that already meagre compensation was further stretched when several households had to share.

Uneven compensation policies continued in 2022, as observed during fieldwork. Some Adivasis with official land title deeds received official support and homes in newly built settlements. Their stable, functional, and fairly well-furnished houses now dotted the newly established village New Padmagudem where approximately 80 Adivasi families were relocated in 2016. A few OBC families also settled here after making informal arrangements with their neighbours. One OBC informant explained the arrangement in this somewhat unproblematic manner:

We trusted the STs [Scheduled Tribes]. We paid for the land, and the STs promised to let us settle on this land that officially belongs to them. They don't create problems for us (Interview, 4 June 2022).

But houses owned by OBC households were smaller and of inferior quality since they were awarded half the compensation to the Adivasis. Additionally they had to arrange themselves for expensive water and electricity services unlike their Adivasi neighbours who received government support. When asked about his experience with resettlement, a disgruntled young man from an OBC family in Aiylapuram stated:

When all of us from Mallepalli lost land, why should only the Adivasis get land and jobs, and more compensation? Land is land after all" (Interview, 5 June 2022).

The Dalit<sup>6</sup> settlements in Manuguru showed the differential experiences of mining displacement and compensation even more starkly. Similar to the OBCs, Dalits received compensation for land at half the rate, and had to find land and build houses by themselves. In this endeavour they were less successful than the better connected and more resourceful OBC households. About 70 of the 200 Dalit families from 'old' Mallepalli resettled in New Mallepalli village; the remaining families moved to other nearby Dalit settlements. During fieldwork in 2022,

New Mallepalli village remained under construction with semi-finished houses, asbestos sheets as roof material, unpainted walls, and a visible lack of amenities and infrastructure. The uneven experiences of compensation across tribe and caste groups is a source of ongoing tension and has resulted in several still pending court cases.

Meanwhile, the Adivasi village Bugga remains deep in the forest, as it did before mining began. The entire village is dependent on rain-fed agriculture and forest-based livelihoods. As the next mining expansion looks like it could affect them, villagers expressed fear about future expansions.

We don't want to become a Singareni-affected village, SCCL simply causes disruptions and does not do anything for the local area. It talks about CSR, but no CSR funds have reached villages. They haven't even built roads (interview, 4 June 2022).

Becoming a 'Singareni affected village' seemed to mean a situation where agriculture is no longer possible to carry out, and no other reliable livelihood option remains unless a job with the mining company can be secured as part of land compensation. Transitions to, and away from coal, continue to be highly disruptive processes with uneven outcomes for the villagers in Manuguru.

#### 4. The operating mines: jobs and environmental costs

In 2011 respondents focused on saving agricultural livelihoods from the expanding mines. Only a handful of respondents interviewed had a coal-related job, and only in temporary occupation as for example security guard rather than with the mining company. It was as if local livelihoods and the nearby coal mines existed side by side without immediate links other than the displacement, environmental effects like cracked houses from mine blasts or depleting groundwater. However, by 2022 people from the same villages have largely left agriculture and aspire to work in the coal sector. The large-scale expansion of the local coal economy, and key changes to land compensation policies where displacement is now compensated with one job per household, have shifted household aspirations towards the coal sector even though the most sought-for work, a permanent job at SCCL, remains rare.

Land compensation policy in 2022 provides one permanent job per displaced Adivasi family, in addition turning the established social caste hierarchy on its head. One Adivasi respondent commented on the dramatic life change his household has experienced over the past decade when his son was offered a job in an SCCL underground mine. While it is dangerous and difficult, a job in the public sector means that the entire family is financially secure for the foreseeable future. However, not everyone sees this as justice. Animosity against the formerly poor Adivasis was prevalent in interview responses. In Aiylapuram village residents recall a fight that broke out between the Adivasis and OBCs in 2015:

The Adivasis get all the jobs and contracts from the SCCL. And to top it all, they want our land too. We found this land on our own, and paid for it, with hardly any help from the government. And when we came here to build our houses, the Adivasis claimed that the land was theirs (Interview, 5 June 2022).

By 2022 active land protests had dissipated and made way for resentment when households could only get a handful of contractual jobs in the mines or at the BTPS thermal power plant. Overall only a few contractual jobs are typically available – as loaders, truck drivers or cooks for which even educated young men compete. 17 % of the respondents in the 2022 livelihood survey mentioned that they depend on partial (or full) employment in coal mines; they find work as badli (temporary) workers, manual labourers and attenders. In New Mallepalli village, for instance, some residents occasionally do manual work for Rs 350–400 per day (USD 4.30–4.90). Commenting on the work possibilities one respondent stated:

<sup>5</sup> Based on official planning details in MoEF (2008).

<sup>6</sup> Dalit is the lowest group in the Hindu caste hierarchy.

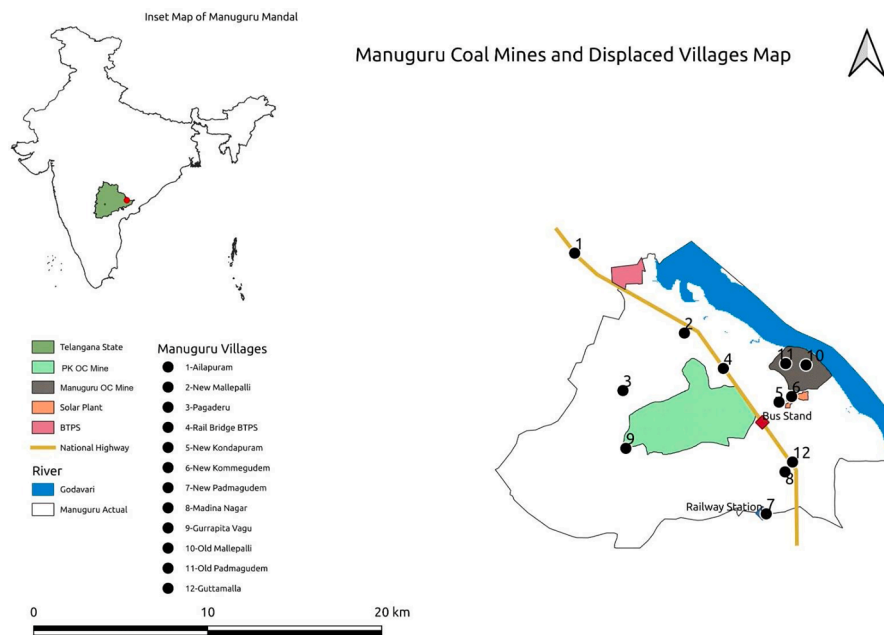


Fig. 1. Coal mines around Manuguru town with displaced villages.

Some jobs are available, but not many. After shifting to New Mallepalli, it has become difficult for us to work in the mines even if there are jobs there because the mines are too far away. So we look for any type of manual labour in the area (Interview, 5 June 2022).

Seasonal out-migration was not reported in the 2022 survey. 16 % of the respondents still owned some land in the region, and all the respondents had a home in Manuguru. While 89 % of the respondents reported being indebted (having borrowed amounts ranging from Rs 30,000–800,000 [USD 360–9600] from relatives and local money lenders), social links to the region were evident. The Mahatma Gandhi National Rural Employment Guarantee Act's 100 days of guaranteed wage employment a year provides a crucial cushion for many households. Meanwhile, OBC villagers have filed cases in different courts demanding jobs at SCCL. These cases are however nowhere close to completion, and for many residents it looks like an endless wait.

SCCL manages the additional work since mining operations expanded with the same workforce as before because of increased mechanisation. It also employs displaced Adivasis as a way to curb local protests. For a majority of local residents the most viable job option is thus with private companies such as Durga and Mahalakshmi which have contracts with SCCL to remove overburden (interview local union leader, Manuguru, 6 June 2022). A few villagers have private jobs in transport or security, while most have to settle for an uncertain future in poverty as soon as the compensation money runs out.

In addition to direct jobs, one of the main demands during hearings for the Prakasham Khani OC mine was the allocation of tenders to locals. In response, SCCL typically provides summary statements in official meetings, while villagers find it very difficult to get direct and up-to-date responses directly from the company. For example, SCCL stated in one public consultation that it provides employment to 390 locals in short-term work such as overburden removal, coal transport, and drivers. In the public consultation for the Prakasham Khani mine, SCCL promised to allocate tenders to displaced families. It also claimed that it had provided contractual employment to 526 locals in the mines (EPTRI, 2020: 7–21).

As can be seen in the 2022 survey, in Manuguru the main livelihood options are agriculture or direct or sub-contracted coal mining jobs. Here, the local community's relationship with coal is markedly different compared to other coal regions in India where a vast, informal economy

underpins all exchanges. In the states of Jharkhand and Chhattisgarh, for example, people living in proximity to coal mines, power plants, or transport infrastructure collect, process, transport, sell, and use coal in a number of informal (and illegal) ways, thus offering an alternative coal sector for the majority unable to get direct employment. In these areas formal jobs have, similarly to Manuguru, failed to support a majority of coal-affected households, resulting in the development of informal coal supply chains which sell coal to households and various cottage industries, including brick kilns and metal-making units (Lahiri-Dutt and Williams, 2005). Such informal activities are not merely local but ensure that coal is used for cooking, heating, and industrial purposes across large areas of, for example, Chhattisgarh state (Chanchani and Oskarsson, 2021).

Why is there no presence of an informal coal sector and such informal uses of coal in Manuguru? One can argue that socio-economic conditions in Manuguru are perhaps more conducive for a relatively formal, regulated, and organised usage of coal. In the coal belts of Chhattisgarh and Jharkhand, poverty and the sheer necessity to fulfil basic needs pushes local communities to scavenge coal, sometimes even by sneaking into closed mines or by pilfering from truck- and train-loading points. None of this was observed in Manuguru during fieldwork where villagers to date have at least some alternative options to being part of often dangerous, informal coal activities. At the same time the coal sector is a quite recent phenomenon in Manuguru compared to other coal regions of India with more than a century of operations. An informal sector may thus develop over time also in Manuguru if many are left without viable alternatives.

As with other coal-side communities in India, respondents in Manuguru showed concern about depleting surface and groundwater which made agriculture on remaining lands challenging, and dust from mine blasts as a hazard to health and crops. In the 2022 survey, 55 % of the respondents spoke of problems with availability of drinking water and water for irrigation and agriculture, and of dependence on borewells with sinking groundwater levels. Every respondent mentioned problems from dust, noise and cracks from blasting. These environmental changes created a difficult situation for farmers and residents close to, but not displaced by, the mines.

In response to the complaints about environmental degradation, the SCCL relied on in-depth studies presented in official reports or at public consultation meetings. One response came in the environmental impact

assessment report for the Prakasham Khani OC which stated: 'Hydrogeological studies revealed that there was no significant change in ground water level' (EPTRI, 2020: para 7–19). There are, however, instances in the past where the SCCL has built water pipelines in the area to provide drinking water.<sup>7</sup> The overall sense of neglect outside of the active mining zone ensured the community further gravitated towards mining jobs as environmental damage made agriculture increasingly challenging, apart from offering lower incomes than coal-sector jobs. From 2011 to 2022 job preferences clearly shifted toward the expanding and better paying coal sector as land was lost or environmentally degraded due to mining.

## 5. Mine closure: transitioning to other land uses and livelihoods

When an open pit coal mine closes it leaves a crater which can be several hundred metres wide as well as deep, and nearby overburden hills. These large scars in the landscape tend to make other land uses and alternative livelihoods difficult to envision. In India, while most government, civil society, and research efforts, in recent decades, have focused on land loss due to mining expansions, a well-designed and effective mine closure plan may mitigate the impact of the loss of jobs and sources of livelihood, and improve the possibilities to find other land uses after a mine closes. This section looks at what is known about mine closures in Manuguru and the possibilities, as well as preparedness, for mined out lands to support other livelihoods once coal mining ends.

In India, a mine closure plan is mandatory as part of the national approval process before a mine can be opened (Indian Bureau of Mines, 2021). It focuses on physical and biological reclamation of the mined-out land thus leaving social changes largely unknown and unaddressed. Available research shows a general lack of concern for the future of mined-out areas with lacking implementation of the bio-physical plans (Bhushan et al., 2020; Mishra, 2018). Upon closure, the formal mine workers tend to be offered employment in other mines whereas since the Supreme Court mandated forest compensation, the land tends to be handed over to the forest department to plant forests (Menon and Kohli, 2021). As the literature as well as the previous section showed, formal jobs are only a small part of the overall workforce. And criticism has been made that forest plantations are neither a democratic nor a livelihoods-oriented approach to reusing closed mining lands.

Since coal mining is a relatively recent activity in Manuguru there have been no mine closures yet. Even the old underground mines have not been closed. Instead of being closed, two underground mines were converted into the open pit mine Manuguru OC, while a third underground mine remains operating at a very low level of production. As per planning documents the two presently operating open pit mines in the area will, however, operate for only a few more years: the Manuguru OC mine will close in 2026 followed by the Prakasham Khani mine in 2030. Of the 595 hectare agricultural land that the SCCL acquired for the Manuguru OC mine in 2014, 430 hectares will be handed over to the state forest department for plantations on closure. This represents a major change of land use: over the course of about a decade of coal mining from 2014 to 2026 16 million tons of coal will have been extracted, but the farms and fields appear lost forever (EPTRI, 2019; SCCL, 2022e).

For the Prakasham Khani expansion mine 403 hectares out of the 735 hectares of land will be handed over to the forest department when it closes in 2030. This in spite of the mine having a specific environmental clearance condition which specifies that '[t]he land after mining shall be brought back for agriculture (sic.) purpose' (SCCL, 2022c: 10). How this can be achieved when there are contradictory requirements for the same

land for forest plantations is unclear in the documents. Similarly, vague plans exist in relation to the workforce once the mining comes to an end. For the Prakasham Khani mine, it is stated that '[t]he skilled and experienced workers of this project will be deployed in the neighbouring mines of SCCL' (EIA: para 4–76).

In spite of the relatively imminent closure of both these open pit mines, our interviews and the survey revealed that little is known about future land use in the area. Planning documents in the public domain and interviews with villagers indicate that the inevitable end including of coal and life thereafter, transitioning to other land uses, are not discussed at the moment. Hence, our respondents were even shocked to hear of this possibility especially when mines in their experience are expanding also in the recent past. A trade union representatives in Manuguru said:

Of course we have heard about climate change. But anyone speaking of moving out of coal by 2070 is just spouting nonsense. This talk of the coal sector finishing off [khatam hona] is very old. India is not so developed, so we have to continue to depend on coal. When Prime Minister Modi talks about moving out of coal, he just wants to close public sector units and further privatise coal mining. That is the politics ... the coal transition debate is basically making a mountain out of a molehill [In Hindi: baat ka batangad]. I have been in the coal sector for 36 years now and I have heard this talk all along.

Although specified in planning documents, the end to coal mining does not appear imminent in Manuguru according to local residents.<sup>8</sup> [9] The closures rather appear forced by the increased extraction rates from the two mines required to supply coal to the new BTPS thermal power plant. Since the power plant has an operational life of 30 years since its inauguration in 2020, local coal mining is expected to continue during this time. Fieldwork conducted in 2022 highlighted a uniform expectation in all the surveyed villages that coal mining would continue expanding. In Madinanagar, the newly established resettlement village where Muslim OBC households built new homes, respondents spoke about plans for future mine expansions, and expected two villages – Pagaderu and Vijayanagaram – to be displaced in the near future.<sup>9</sup> In Shantinagar, villagers were expecting (and apprehensive of) more mine expansions with concomitant displacement.<sup>10</sup> In the forested village of Bugga, the Adivasi villagers similarly worried about continued mine expansions.<sup>11</sup>

During the initial fieldwork in 2011 it was apparent that planning for a future without coal mining was missing. At this time the new Prakasham Khani mine was proposed to continue for another 60 years, making the plans appear less imperative, even if mandated by law. In 2022 the Manuguru area is further enmeshed in coal extraction with a new open pit mine and a new thermal power plant. A transition away from coal thus seems more remote in 2022 than it did in 2011. At the same time, the planned closure of the two existing open pit mines raises concerns about future land uses and enforced livelihoods change again. Mine expansions as well as mine closures continue to be top down processes where local residents simply have to adjust.

## 6. Conclusion

This article explores wide-ranging transformations in the agricultural town Manuguru into a major energy hub with inhabitants increasingly transitioning from land-based occupations to the coal economy to sustain their livelihoods. While in 2011 hardly anyone in the

<sup>8</sup> There are mentions of a new mine next to the Manuguru OC (in e.g. SCCL (2022b, 2022c, 2022e)) but no publicly accessible plans exist to date as far as is known.

<sup>9</sup> Interviews in Madinanagar conducted on 6 June 2022.

<sup>10</sup> Interviews in Shantinagar conducted on 4 June 2022.

<sup>11</sup> Interviews in Bugga conducted on 5 June 2022.

<sup>7</sup> Like other large companies the SCCL has an active corporate social responsibility programme for local amenities and infrastructure projects such as laying roads, building classrooms, and providing street lights.

coal-side villages worked in the mines, the main demand of the youth in 2022 is to get new jobs in the mines, or perhaps more likely, in the new thermal power plant. The coal sector thus more than ever dominates the local economy, not to mention uses up an overwhelming part of its land. In the wake of these changes communities increasingly find their aspirations turned toward the industry and away from land-based occupations. Local jobs, however, tend to be available intermittently within for example construction or transport services, apart from some of the displaced Adivasis who secured the gold standard for rural households – a permanent public sector job able to secure the family for the foreseeable future.

Some Adivasis, have throughout the research period received much better displacement compensation than the other residing groups. The intention of policymakers to provide extra support for this disadvantaged group is showing some results. Displaced Adivasis with land title deeds have received new houses and monetary compensation, and have even received much sought-after permanent jobs at the SCCL. A small number of Adivasi households may thus be on their way to become the new local, middle class. On the other hand, OBC households who had historically controlled the best agricultural lands to wield local influence, received little compensation in the local post-displacement economy—their present predicament largely, and understandably, rests on the fact that they had illegally grabbed these agricultural lands in the past. The worst, however, are the Dalit households who received meagre compensation and lack other resources to secure even basic housing amenities.

The Manuguru displacement experiences thus allow a study of the communal aspect of a nation at the micro-level. When households climb the local economic ladder this is inevitably tied to their caste-belonging since only Adivasis can receive a permanent job or land compensation when displaced. OBC or Dalit households in our interviews did not see this being justice. Communal distrust and unrest is expected despite the intent to compensate the original inhabitants of the area, the Adivasis according to the law. Furthermore, uneven effects of compensation policies mean that the old, mixed-caste villages that have been common in this part of southern India are now splitting into multiple, caste-based villages.

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

Can any kind of transition in Manuguru be seen at present when coal seems to continue its expansion? Tragically, the only transition that is visible is towards further intensified coal production. The coal sector dominates the local economy of Manuguru and uses an overwhelming part of its land. Particularly the rate of extraction has increased dramatically to serve a new power plant, which makes the topic of mine closure in the near future very difficult to believe. A transition away from coal in the area is harder to imagine today than it was a decade ago given the mining expansion, and the changed aspirations noted among large segments of the population who now broadly aspire for more lucrative jobs in the coal industry. The only planned transition away from coal is to provide mined-out land to the forest department to raise plantations. Though the emphasis is on native species, the scant details of these plans make them appear as commercial plantations that would

not support the needs of local, post-displacement livelihoods.

## CRediT authorship contribution statement

**Patrik Oskarsson:** Writing – review & editing, Writing – original draft, Project administration, Methodology, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Radhika Krishnan:** Writing – review & editing, Writing – original draft, Resources, Project administration, Investigation, Formal analysis. **Kuntala Lahiri-Dutt:** Writing – original draft.

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