Life After Coal Mine Closure



Lessons Learned for a Just Transition

By Just Transition Research Centre Indian Institute of Technology Kanpur



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Executive Summary

Scientific evidence shows that human activities like overconsumption of natural resources, ecological degradation and pollution has led humanity to one of its most pressing challenges: climate change. To deal with the crises the countries need to transition away from fossil fuel driven energy systems to those based on alternative energy. In the process of phasing out fossil fuels, the related workforce and communities face an uncertain future with imperiled social and economic security. For coal dependent India, phasing down mines presents a greater challenge due to pre-existing socio-economic inequalities in the coal sector.

Against this backdrop the current report explores the aftermath of a mine closure. It presents the case of Margherita, Assam where mine closure left people without any alternative occupation for almost 2 years. The report is divided into three parts. The first part presents the context of the closure and the resulting contestation between ecological and developmental concerns. The second part delves into the lived experiences of the mince closure and the economic and social adversities that the community faced. Taking lessons from the mine closure, the third part elucidates on the ways in which socio-economic resilience of the coal communities can be built into the future energy policy frameworks.

Figure 1: Lessons Learned from Coal Mine Closure in Margherita, Assam

Chapter

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Contestation between the Environment and Development

Underlines the urge for wildlife protection and environmental reclamation as the driving force for coal mine closure

Lesson 1.

Mine-forest-wildlife nexus is susceptible to socioecological contestation

Lesson 2.

Green campaigning may lead to mine closure, but local demand for socio economic development cannot be ignored

Chapter 02

Impact on Coal Worker and Non-worker Communities

Elucidates the present status of health and education facilities, job loss, livelihood changes and workforce drain

Lesson 3.

Economic diversification is a potential measure for mitigating the adverse consequences of the Margherita mine closure

Lesson 4.

Strong institutional support in the health and education sectors enhance the resilience of the community against the adversities of the mine closure

Lesson 5.

Mine closure forces the workers to migrate to faraway places with uncertain future

Chapter 03

Policy and Strategy development

Addresses the significance of trade unions and policies in achieving sustainable livelihood in the development of just transition policy

Lesson 6.

Trade union as agents of change: Unions can make strategic choices together in response to a variety of contextual conditions

Lesson 7.

To achieve sustainable livelihood after coal mine Closure, the policies must think beyond jobs

Introduction

Section

Mines are closing and will continue to do so for a variety of reasons, including depletion of reserves, climate change mitigation, unfavourable geo-mining conditions and safety concerns. However, the idea of systematic mine closure is relatively new to the Indian coal industry. The initial set of mine closure rules was released in 2009 and was updated in 2013. An all-encompassing, comprehensive framework for mine closures that will apply to legacy mines, mines that have recently closed and mine closures that are imminent can make the whole transition successful. The Ministry of Coal of India is finalising a strong framework for the closure of mines that emphasises three key areas of institutional governance: workers and communities, environmental reclamation and land repurposing, in accordance with the principles of just transition. Not only should sites of closed mines be kept secure and environmentally sound, but those who were either directly or indirectly dependent on the mines needed to have their means of subsistence guaranteed. Reclaimed land will also be used for social and economic purposes, such as townships, forestry, sports, tourism, agriculture and horticulture. Before exploring in detail, the following critical concepts need to be cleared.

What is a

Just Transition?

The term just transition emerged in the late 1970s when the US Oil, Chemical and Atomic Workers Union sought support for workers whose jobs were threatened by environmental regulation (Gambhir et al., 2018). In the 1990s, the union pleaded for a 'superfund for workers' to provide financial support and opportunities for higher education to workers in affected industries. By 1997, several US and Canadian unions had endorsed the just transition principle (Galgóczi, 2018).

At the transnational level, trade unions and their international confederation started to include just transition in their stakeholder statements at global climate and sustainability conferences, starting with the third session of the Conference of the Parties (COP) in Kyoto, Japan in 1997. The concept first made it into an official decision at the Climate Change Conference in 2010 in Cancun, Mexico (Galgóczi, 2018).



Global Climate Agreements

(Maizland, 2021)

Montreal Protocol (1987)

Every country in the world eventually ratified the treaty, which required them to stop producing substances that damage the ozone layer, such as chlorofluorocarbons (CFCs). The protocol has succeeded in eliminating nearly 99% of these ozone-depleting substances.

Kyoto Protocol (1997)

Operationalised the UNFCCC by enticing industrialised countries and economies in transition to limit and reduce their greenhouse gas (GHG) emissions in accordance with agreed individual targets. The convention itself only asked those countries to adopt policies and measures on mitigation and to report their results periodically. It only bound developed countries and placed a heavier burden on them under the principle of 'common but differentiated responsibility and respective capabilities' because it recognised that they are largely responsible for the current high levels of GHG emissions in the atmosphere.

Copenhagen Accord (2009)

The agreement proposed measures to keep the average global temperature rises to two degrees Celsius above pre-industrial levels.

Paris Agreement (2015)

The Paris Agreement is a legally binding international treaty on climate change. It was adopted by 196 Parties at COP 21 in Paris on 12 December 2015 and entered into force on 4 November 2016. Its goal is to limit global warming to well below 2 degrees Celsius and preferably to 1.5 degrees Celsius compared to pre-industrial levels. The agreement also acknowledged 'the need to take into account the imperatives of the just transition in the workforce for the creation of decent and quality employment in line with nationally defined development priorities.'

Silesian Declaration (2019)

This declaration represents a significant milestone, sending a crucial message that workers will not be sacrificed in an effort to cut emissions and arrest climate change and that the low-carbon economy will be fair and inclusive.

Glasgow Climate Pact (2021)

The package of decisions consists of a range of agreed items, including strengthened efforts to build resilience to climate change, to curb greenhouse gas emissions and to provide the necessary finance for both. Nations reaffirmed their duty to fulfil the pledge of providing 100 billion dollars annually from developed to developing countries. They also collectively agreed to work to reduce the gap between existing emission reduction plans and what is required to reduce emissions so that the rise in the global average temperature can be limited to 1.5 degrees Celsius. For the first time, nations are called upon to phase down unabated coal power and inefficient subsidies for fossil fuels. As part of the package of decisions, nations also completed the Paris Agreement's rulebook on market mechanisms and non-market approaches as well as the transparent reporting of climate actions and support provided or received, including for loss and damage.



In 2013, the International Labour Organization (ILO) adopted its Resolution concerning sustainable development, decent work and green jobs, which refers to just transition. Following up on the resolution, the ILO published the more concrete Guidelines for a just transition towards environmentally sustainable economies and societies for all in 2015. The Guidelines shall 'provide non-binding practical orientation to Governments and social partners with some specific options on how to formulate, implement and monitor the policy framework, in accordance with national circumstances and priorities' (ILO, 2015, p. 3). There are various definitions of 'just transition' in global climate agreements, which are described below:

Cancun Agreement (2010):

This agreement first explicitly recognised that climate change action should ensure a just transition of the workforce. As noted in the agreement:

Climate change requires a paradigm shift towards building a low-carbon society that offers substantial opportunities and ensures continued high growth and sustainable development, based on innovative technologies and more sustainable production and consumption and lifestyles, while ensuring a just transition of the workforce that creates decent work and quality jobs. (p. 11)

Paris Agreement (2015):

The Preamble of the 2015 Paris Agreement also refers to just transition by committing to 'tak[e] into account the imperatives of a just transition of the workforce and the creation of decent work and quality jobs in accordance with nationally defined development priorities' (p. 2). At the UNFCCC COP24 in 2018, the Solidarity and Just Transition Silesia Declaration was adopted.

• International Trade Union Confederation:

To ensure that labour has a voice in the just transition to a low-carbon world, the Just Transition Centre (JTC) brings together workers and their unions, corporations, and governments for stakeholder engagement with communities and civil society. JTC said that:

A just transition secures the future and livelihoods of workers and their communities in the transition to a low-carbon economy. It is based on social dialogue between workers and their unions, employers, government and communities. A plan for just transition provides and guarantees better and decent jobs, social protection, more training opportunities and greater job security for all workers affected by global warming and climate change policies.

European Commission (2018):

The commission said that '... ensuring a fair and socially acceptable transition for all in the spirit of inclusiveness and solidarity' (Mengolini & Masera, 2021).

International Labour Organization (ILO) (2015):

The ILO Guidelines (ILO, 2015, p. 4) state that: A just transition for all towards an environmentally sustainable economy, as described in this document, needs to be well managed and contribute to the goals of decent work for all, social inclusion and the eradication of poverty . ILO also stated to consider.(a) economic restructuring, resulting in the displacement of workers and possible job losses and job creation attributable to the greening of enterprises and workplaces; (b) the need for enterprises, workplaces and communities to adapt to climate change to avoid loss of assets and livelihoods and involuntary migration; and (c) adverse effects on the incomes of poor households from higher energy and commodity prices.

• World Bank (2021):

During a discussion at the World Bank's Annual Meeting in 2021, Mari Pangestu, World Bank Managing Director for Development Policy and Partnerships, said, 'Transitioning away from coal in the electricity sector is the single most important step to limiting global warming... We are committed to helping countries accelerate the energy transition, but at the same time, we also focus on the important aspect, which is the people-how do we protect workers, their families, communities and the environment?...It's vital that we support workers and communities to build and access new economic opportunities in the transition to clean energy. It's about jobs, skills and obviously, better lives' (World Bank, p. 20).

Political Economy of Just Transition

The previous section described the myriad ways in which just transition has been defined and tried to reveal the potential for enacting a just transition. However, the larger, complex political economy of energy justice and injustice needs to be addressed to ground just transition in a world with high levels of energy interdependence. The following points highlight the embeddedness of energy systems and just transition in the larger national and global political economies.

- Just transition is integrated in the larger political economy context by centrally addressing the fundamental political economy issues of 'who wins, who loses, how, and why,' as opposed to the somewhat unsystematic approach that merely maps the relevant actors (Schmidt, 2020).
- Addressing the justice-related concerns in the global economy based on fossil fuels is even more difficult. Affordable energy is the backbone of consumer culture and the heart of industrial economies. In the words of Bradshaw (2010), 'The fabric of our economy, and some would argue, our political system ('carbon democracy'), is dependent upon the plentiful and relatively inexpensive supply of fossil fuels'. The fossil-fuel based global economy has created complex and unequal power structures at the global to regional levels, thereby complicating the integration of justice into the energy transition process.
- The notions of energy poverty and energy access must be integrated into the current energy transition process.
- Climate activists and donors are enamoured with the phrase just transition, but their definitions are context-deficient. As the global efforts to reduce carbon emissions gain speed, climate activists are highlighting the value of the economy, jobs and social safety nets. Specifically, climate activists in developed nations, despite their best intentions, frequently lack the lived experience of inequality or exposure to inequality in unequal societies. As a result, they pursue a narrow emphasis on emissions reduction, which results in unexpected and unintended effects.

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The fossil based global economy has created complex and unequal power structures at the global to regional levels, thereby complicating the integration of justice into the energy transition process.

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- The drive for deeper decarbonisation, as seen in the setting of net-zero targets, may appear to impose responsibilities that fail to consider the nuances and difficulties of energy transitions in developing and rising economies.
- There may be moral imperatives for global action, but because **people in positions of power in the energy system have the ability to resist change**, actors who have vested interests in the fossil fuel economy and are powerful enough to resist changes and influence policy normally do not bend so easily to global norms. Transformational change is sometimes put off by those actors.
- A mere climatic policy is insufficient to address the just transition issues in economies that are heavily dependent on fossil fuels. A key component of this strategy must be a broader discussion of economic diversification and liberating the populace from the grip of elite influence.
- The political economy of just transition is inseparably linked to the policy agenda of the national government of the concerned country (Dubash et al., 2019). This necessitates rethinking the technoeconomy-dominated energy policy to incorporate the context-specific politicaleconomic dimensions of just transition.

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Sustainable Development and the Three Pillars of Sustainability

The Brundtland Commission is often credited with popularising the idea of sustainable development by introducing it into international policy debate, even though that the word has been in use for some time (e.g., International Union for Conservation of Nature [IUCN], United Nations Environment Programme [UNEP] and World Wildlife Fund [WWF], 1980; Basiago, 1999; Castro, 2004; Johnston et al., 2007; Pope et al., 2004; Redclift, 2005). The Commission defines sustainable development as 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs'. The concept of sustainable development came to the fore in the environmental movement in the years after the release of the Brundtland Report, when the body of literature that examined it exploded.

The Rio Process, launched at the 1992 Earth Summit in Rio, where the political leaders of the globe vowed to embrace the notion of sustainable development, thereby institutionalised the concept of sustainable development (Jordan & Voisey, 1998). The release of the Rio Declaration, which contained 27 principles that guided future sustainable development, and Agenda 21, which laid out a strategy for putting such principles into practice, played a key role in this. The Brundtland Report served as a foundation for Agenda 21. It highlighted the issues of the North-South development gap, promoted economic expansion and free trade and emphasised the need to combine social and economic development with environmental protection (UN, 1992).





The notion of sustainable yield was pioneered by forestry specialists from the 17th and 18th centuries, including John Evelyn and Hans Carl von Carlowitz, in light ofEurope's depleting forest resources (Grober, 2012; Warde, 2011).

The early political economists such as Adam Smith, John Stuart Mill, David Ricardo and Thomas Robert Malthus recognised the inherent trade-offs between wealth creation and social justice in the wake of the Industrial Revolution and questioned the limitations of both economic and demographic expansion (Caradonna, 2014; Lumley & Armstrong, 2004).

The environmental movement gave rise to the notion of sustainability. As mentioned earlier, it is understood to entail ensuring that the requirements of the current generation may be met without compromising the ability of future generations to do the same.

It soon became clear that environmental issues cannot be resolved in a vacuum from other issues. A nation's environmental aspirations are frequently scaled back when its economy is weak. The ecology suffers severely in areas where there is war or extreme poverty. Everything else appears to be more important. Environmental, economic, and social sustainability are all topics to discuss in the present context of just transition. If sustainability is the roof of a sector such as the coal industry that shields its residents, however, it needs support from all three pillars of sustainability (Figure 2).

Note. Source: Purvis et al., 2019.

Sustainable Livelihood Approach and Just Transition

The sustainable livelihood approach (SLA) to development links the global to the local while emphasising participation, sustainability, legitimacy, democratic processes and empowerment. It also aims to consider the various systems, networks and daily activities that are present in a given community when formulatinga development plan (Helmore& Singh, 2001). Sustainable livelihoods include an element of resilience in addition to the economic, social and environmental pillars of sustainability. The idea of sustainable livelihoods 'may deserve examination as a valuable, more tangible, organisational framework, particularly for work with impoverished or marginalised people' (Wall, 2007) as an alternative to the predominantly macro-level focused sustainable development approach.

Different SLAs are based on the concept of sustainable livelihoods, and development organisations such as the British Department for International Development (DFID) have adopted this concept. One of the most popular livelihood frameworks in development practice in 1997 was the sustainable livelihood framework (SLF), which was created by DFID. The sustainable livelihood approach has a flexible application that may be tailored to specific local contexts and goals formulated in a participatory manner (DFID, 1999).

In this study, JTRC IITK attempts to incorporate the three pillars of SLA (i.e., the social, economic and environmental approaches), within the framework of just transition and elucidates the possible fit into the just transition policy discourse (Figure. 3).

Figure 3 Characteristics of the Sustainable Livelihood Approach in Just Transition



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Characteristics of the Sustainable

Livelihood Approach (SLA)



ife After Coal Mine Closure



People-centred: In SLA, the focus is on the people rather than the resources they utilise because development issues frequently have their roots in unfavourable institutional arrangements and cannot be solved by simply creating more assets.

Holistic: A holistic view is designed to understand the stakeholders' livelihoods as a whole, with all their facets, through a feasible model that helps to address the most pressing obstacles that people have to face.

Dynamic: The strategy taken to adapt to changes, assist in minimising negative effects and boost positive benefits is very dynamic, just as people's livelihoods and the institutions that define their lives are.

Building on strengths: The awareness of everyone's inherent potential for freedom from limitations and realisation of their potentials is a key component of SLA. To increase the stakeholders' resilience and capacity to accomplish their goals, this strategy starts by identifying their strengths rather than their needs and challenges.

Macro-micro links: Development activity tends to centre at either the macro or micro level, whereas SLA aims to bridge this gap by highlighting the linkages between the two levels. To achieve sustainable development, it is important to consider this relationship, because macro-level policy decisions frequently have an impact on people and vice versa.

Sustainability: If a livelihood can maintain the long-term productivity of natural resources, is independent of external support, is resilient in the face of external shocks and stresses and does not jeopardise the options of others, it is considered sustainable (Kollmair et al., 2002).

Objective

The objective of this report is to share with policymakers the ground reality regarding coal mine closure. Indeed, the coal mine closure process is diverse, with few optimistic case studies to date to draw on. This report sought to identify lessons from the coal mine closure in the North Eastern Coalfields (NEC) in Margherita, Assam, India that can guide policymakers for more successful future mine closures. The seven lessons learned are presented in three broadly themed chapters, drawn from field-level research with few relevant studies for support.

Chapter 01

Chapter 02

explores the context of the contestation between the environment and development that covers the coal mine-forestwildlife triode in the process of just transition, the strength of the save wildlife campaign and the controversy of the elephant corridor that has been spread. elucidates the impact of coal mine closure on the coal worker and non-worker community, incorporating both the economic and social impacts of coal mine closure. Economic impact depicts the job loss and livelihood changes of communities, the production and despatch trends of coal when the mines were operating, the role of corporate social responsibility and the district mineral trust fund, and the trade around coal. Social impact mainly shows the status of health and educational facilities and the extent of migration.

Chapter 03

illustrates the role of trade unions in the process of transition. It reveals some broad areas where an SLF could have an impact on policy or lead to activities that support coal mine worker and non-worker communities whose livelihoods are at stake because of coal mine closure. The process of acknowledging the complexity and diversity of livelihoods in the course of mine closure and incorporating this recognition into policy can include critical discussions on just transition.

Brief History of Margherita Coal



Mines in Assam

Coal mining in Assam (Figure . 4a and 4b) started in the mid-19th century, during the British rule in India, when it was felt necessary to excavate coal to expand tea plantations and introduce commercial navigation on the Brahmaputra River in early 1860s'. The British rulers allowed coal to be mined and formal coal mining in Tirap started in 1861 on certain conditions.

After India won its independence from British rule, upon the promulgation of the Coal Mines (Nationalisation) Act in 1973, the rights of the owners of the coal mines in the Jeypore Coalfield, Makum Coalfield and Mikir Coalfield in Assam were acquired, transferred to and vested absolutely in the central government, free of all encumbrances. Out of the said coal mines, the Borgolai, Ledo, Namdang and Tipong coal mines in Makum Coalfield were owned by the company named AR&TC in Margherita. In 1975, Coal India Limited (CIL) became the lessee of the coal mines of Makum Coalfield by virtue of subsection (2) of Section 5 of the 1973 Act. Later, CIL was granted a fresh mining lease for a period of 30 years.



Fiaure 4b Map of the Study Coal Mines in North Eastern Coalfields, Margherita, Assam **Coal Mine** Study Area Margherita **Block Office** Tipong 25 KM Tirap Ledo Tikak Borgolai A L Ρ R 10 km

Note. The maps were made using the Q-GIS application.

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Chapters of Coal Mine Closure:

Exploring the Ground Reality and the Lessons Learned

The seven lessons learned while exploring the ground reality of coal mine closure at the Margherita coalfields of Assam are discussed in this chapter. The lessons are organised under three chapters on managing coal mine closure: (i) Contestation between the environment and development as the precursor; (ii) Impact on coal worker and nonworker communities as the present situation; and (iii) Policy and strategy development as the future propositions. Figure. 5 summarises these chapters.

Figure 5 Lessons Learned from Coal Mine Closure

Chapter Ol

Contestation between the Environment and Development

Covers-Lesson 1.

Mine-forest-wildlife nexus is susceptible to socioecological contestation

Lesson 2.

Green campaigning may lead to mine closure, but local demand for socio-economic development cannot be ignored

• Stakeholders of the Margherita coal mines expressed some viewpoints of their own, on the reason behind mine closure

Chapter 02

Impact on Coal Worker and Non-worker Communities

Illustrates-

Lesson 3.

Economic diversification is a potential measure for mitigating the adverse consequences of the Margherita mine closure

- Declining trend of coal production and supply in Margherita
- Inconsistent support from Corporate Social Responsibility (CSR) and District Mineral Foundation Trust (DMFT)
- Trade based on coal from NEC may suffer from supply crunch
- Need to explore non-coal local enterprises
- Possible subsistence from agriculture: local economy beyond coal
- Unavoidable job loss and livelihood changes after a coal mine closure

Lesson 4.

Strong institutional support in the health and education sectors enhances the resilience of the community against the adversities of the mine closure

- Social welfare activities for the overall development as well as enhanced living standards of the townships
- Health facilities are among the basic needs communities
- The coal mine can be closed educational institutions must go on
- Relief and rehabilitation prevent burdening the society after the mine closure

Lesson 5.

Mine closure forces the workers to migrate to faraway places with uncertain future

Outmigration Map of Margherita, Assam

Chapter 03

Policy and Strategy development

Addresses-

Lesson 6.

Trade union as agents of change: Unions can make strategic choices together in response to a variety of contextual conditions

Lesson 7.

To achieve sustainable livelihood after coal mine closure, the policies must think beyond jobs

• Key Structure and Entry Points to implement the Sustainable Livelihood Framework into Just Transition Policy

Chapter 01

Contestation between the Environment

and Development

Growing material consumption is increasing demand for minerals while ambitious targets are being set for expanding biodiversity-rich protected areas under the UN Convention on Biological Diversity (Jowitt et al., 2020; Tabelin et al., 2021). It is estimated that in the world, high biodiversity areas coincide with 23% of mines and 20% of mineral deposits of bauxite, silver, iron, gold and copper (Murguía et al., 2016). Areas of rich biodiversity overlap with 63% of mines and 61% of deposits of the aforementioned metals (Murguía et al., 2016). Recent studies are recognising this growing overlap and the need to address the intensifying competition between mining and forest-wildlife conservation activities for land areas (Sonter et al., 2018).

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Chapter 01

Lesson 1.

The mine-forest-wildlife nexus is susceptible to socioecological contestation.

The Dehing Patkai Wildlife Sanctuary in Assam, one of India's most significant rainforests, has become the site of a fight between wildlife protection and cheap coal that are mined from the area.

The Khamti, Singpho, Sema Nagas, Tangsa, Tai-Phake, Syam, Aitom, Nocte and other communities that have been impacted by mining and deforestation have been forced out of the areas that historically belonged to them and now live in the foothills of Dehing Patkai in the eastern part of Assam.

Different Types of Forests



There are three types of forests: tropical rainforests, temperate and boreal. The types of rainforests include:

- Tropical mangrove forests;
- Temperate rainforests;
- Seasonal rainforests;
- Semi-evergreen forests; and
- Moist or dry deciduous forests.

The Dehing Patkai rainforest, which is located farther east of the Brahmaputra River, would cover more than 900 km² if the Dehing Patkai Elephant Reserve and more than a dozen patches of reserve forests and potential reserve forests were included. However, the wildlife sanctuary alone covers only 111.9 km² and contains two tiny elephant corridors and dispersed woodland areas encircled by coal mines and tea gardens.

Before this lowland evergreen forest, which is internationally threatened, was formally protected as a sanctuary in 2004, there was industrial activity in the area for more than a century. In the Brahmaputra Valley in Assam to Punjab and Haryana, thousands of tea factories, thermal power plants, small-scale iron smelters and brick kilns are supported by coal from five mines in the Makum Coalfield, one of the oldest mining regions in India.

A preliminary assessment of the soil and water quality of Makum Coalfield, which was published in 2013, also revealed excessive sand content in the areas near the mines, including the forested parts, brought on by indiscriminate dumping, which, in turn, stunted plant development (Chakravartty, 2020).

Various reports were published in various electric and print media alleging CIL's and its subsidiaries' illegal coal mining activities and some other unscrupulous activities, and the detrimental environmental impact of such activities on local flora and fauna, in the Saleki Proposed Reserve Forest (PRF) under the Digboi Forest Division, including the Tikak Open-Cast Project (OCP) area. The allegations were particularly of violations of the Forest (Conservation) Act of 1980 and the Wildlife (Protection) Act of 1972. The Governor of Assam, exercising the powers conferred upon him under Section 3 of the Commissions of Inquiry Act of 1952, constituted a commission to investigate, within six months, any violation by any corporation, organisation or individual of laws related to the forest, wildlife, mining and the environment in the last 20 years in the course of their mining or any other activity in the aforementioned forest areas. The commission conducted field visits to Saleki PRF, Tikak OCP, Tirap OCP and other adjacent areas in December 2020, took a few more months to complete the enquiry and highlighted the following points in their detailed report:

- The coal mining activities in forest land in Saleki PRF, which is part of the Dihinh Patkai Wildlife Sanctuary and of the Dihing Patkai Elephant Reserve, should not be permitted, as they would not only have adverse impacts on the environment but also disturb the ecology and destroy the biological diversity of the area and the rain forest.
- Destruction of forests through informal coal mining adversely impacted the flora and fauna in and around the forest area of Tinsukia district and affects the socio cultural and economic fabrics of the area.
- The commission also pleaded for combatting environmental degradation because of opencast mining in the hills of the Patki region and in the areas around Saleki PRF, Namdang, Tikak, Ledo, Tirap, Tipong, Lekhapani and Jagun in the district of Tinsukia.
- Diversion of forest land to non-forest land, particularly to coal mining, should be stopped to clear the encroachments in the forest land and also in the elephant corridors that cause man-animal conflict.
- Approval was granted, as required by Section 2 of the 1980 Act, to the North Eastern Coalfields of Coal India Limited (NEC CiL) to restart mining activities, as their suspension had led to vast unemployment.

After the release of the commission's report, the Mines and Minerals Department of the Government of Assam passed subsequent orders, and the lease was extended until 2 January 2023. However, the said extensions of the mining leases have not come into effect to date because of the non-compliance of NEC with the Forest (Conservation) Act of 1980. Later, NEC sought government approval, under Section 2 of the 1980 Act, of the renewal of its three mining leases, namely, a 10.36 km² mining lease, the Namdung Coal Grant lease and the Tirap Coal Grant lease, which fall under the Digboi Forest Division. However, as per the report, the Ledo underground mine and the Tikak OCP are fully situation in the forest land. Then, NEC submitted another proposal in 2012 for opening the Tikak OCP by converting forest land to non-forest land, although the central government ruled that no forest land can be used for non-forest purposes without obtaining prior approval.

Apart from these, during a field visit, the commission also found dumping of overburdens near the Tikak OCP that is damaging the vegetation besides polluting the environment. In 2020, the commission revisited the mining areas and found rat-hole mining around the Saleki PRF. The commission pointed out the problems, such as non-conduct of satellite mapping through the North Eastern Space Applications Centre (NESAC) or a similar agency despite prior directions to do so, the extent of informal mining and encroachment and the negative impact of coal mining on the flora and fauna, The commission further cited as informal or illegal mining, all the mining activities of NEC after the expiry of its original lease period and in the absence of the

prior approval of the central government. The commission also received a complaint about degradation of land fertility, damaging of the paddy field and compensation demand. Then, the court directed the state government of Assam to decide on the compensation amount that NEC had to pay under the policy that 'polluters pay'.

Finally, the coal production in Tikak OCP and Tirap OCP was stopped on 24 October 2019 and 3 June 2020, respectively. As the mines were closed, the implementation of the mine closure plans posed another challenge. The general managers of NEC and CIL stated that no mine closure plan was required to be framed and implemented as those collieries were not closed in accordance with any closure plan. However, the commission did not find any valid reason for the delayed implementation of the mine closure plan, as the non-implementation not only caused environmental pollution but also exposed the residents and the fauna to risks to their lives. NEC assured the commission that the mine closure plan will be implemented in a phased manner with afforestation and reclamation work in the mine areas. However, the claims stay on paper rather than being duly implemented. In March 2022, the Union Minister of Coal, Mines and Parliamentary Affairs, Pralhad Joshi, inaugurated the resumption of the mining operations at the Tikak OCP. With the resumption of its operations, NEC hopes to produce 4 lakh tonnes of coal per annum from two collieries—the Tikak OCP and the Tikak Extension OCP. The Tirap OCP will also resume its operations in a few months, with a target production of 10 lakh tonnes of coal annually (The Hindu, 2022).



Life After Coal Mine Closure 2022

Green campaigning may lead to mine closure, but local demand for socioeconomic development cannot be ignored.

Stakeholders of the Margherita coal mines expressed some of their viewpoints on the reason behind the mine closure, as follows (see also Figure 6).

- Trade unions were found to have very clearcut information on the closure of Margherita. They stated two major reasons behind the coal mine closure: (i) CIL's failure to obtain forest clearance and (ii) the rampant informal mining.
- A NEC employee informed us that the company received a closure notice in 2008 for operation of unsafe mines.
- A local student union leader said that he did not know the clear reason behind the sudden mine closure. According to him, the company did not want closure but wanted to run the mines with scientific precautions.
- A local journalist said that the former Member of Legislative Assembly (MLA) and present Member of Parliament (MP) raised their voice against coal mining in the Dehing Patkai Wildlife Sanctuary region. Local nongovernmental organisations (NGOs) and student unions also joined the campaign against coal mining in the Dehing Patkai area.
- An agent from the Tikak OCP said that NEC was to renew its lease and receive several approvals from almost 14 statuary bodies of forest, environment, coal control and others but that NEC applied later and did not receive permission to operate the coal mines as it was instructed by the higher authority to close the mines. The application has not yet been rejected until now but has only been delayed, with hope of re-opening the mines someday.
- The Gaon Bura (the Village Head) of Tangsa community narrated a completely different story. He stated that the mine was closed for a controversial reason. There were protests against the coal mines due to concern for an elephant corridor and for conserving the biodiversity. Astonishingly, both the Gaon Buras of the Tangsa and Ao communities did not agree with the protesters, as they had

never heard about elephants in this Patkai region. Both of the previously mentioned tribal Gaon Buras of the Tsang and Ao groups cited that they protested the coal mine closure as the mines were their main source of livelihood. The Gaon Buras protested with the trade unions of Tikak colliery, even though they were not trade union members.

- Media and civil society organisations (CSOs) were very much involved in the pre-closure phase and published stories on elephants, elephant corridors and many more.
- The forest officer revealed that the coal mines were closed because, first, NEC lost its forest clearance and, second, because a rumour spread that mining had been started at the Dehing Patkai National Park, which is a wildlife sanctuary, and at Patkai Hills, which is shared with Arunachal Pradesh.



Outraged by the approval of coal mining at Dehing Patkai, several environmentalists, activists, student organisations, artists and other citizens of the state launched a powerful online protest using well-considered artworks, slogans, videos and online signature campaigns. They also made hashtags such as #savedehingpatkaiwildlife, #SaveDehingPatkai and #IAmDehingPatkai that trended on several online platforms. They all urged a total ban on open-cast coal mining, claiming that it harms the biological balance of the animal sanctuary.

Chapter 02

ie Closure 2022

Coal

Impact on Coal Worker and

02

Non-Worker Communities

Physical hardships faced by workers due to carrying heavy loads of coal

Life After Coal Mine Closure 2022

Given the singular economic dependence on coal in coal-rich regions, coal mine closures can result in substantial job loss not only in coal mines but also in related businesses and industries. Past mine closures have left coaldependent communities lagging far behind other areas of the country, both socially and economically, mainly due to the difficult and resource-intensive process of rebuilding the economic base of mono-industry regions. In case of mine closure, the challenge of economic revitalisation alongside maintaining social equilibrium is all the more difficult. Just transition for all would mean mitigating the social and economic risks for the workers, their families and the coal-dependent communities at large. However, a part of the community attempts to shift their livelihood within the feasible options available in the study region, though they face hardships in their new plight.

In this section, we illustrate the socioeconomic impacts of mine closure on the workers and communities of the Margherita region. Based on these impacts, we derive three lessons that can guide a favourable trajectory toward just transition.



Lesson 3.

Economic diversification is a potential measure for mitigating the adverse consequences of the Margherita mine closure

NEC, one of subsidiaries of Coal India Limited operates in Margherita of Tinsukia district of Assam. The local economy of this community development block evolves only around the coal mine. Thus, after the coal mine closure, this area has been impacted in various directions and quantum.

Declining trend of coal production and supply in Margherita

The last official production and despatch of coal from the five coal mines of NEC in Margherita (i.e., Tikak [OC]¹, Tipong [UG], Tirap [OC], Borgolai UG] and Ledo [UG and OCP]) were in 2015–2016, after which the mines remained closed. Based on the data from the NEC official website, Figure 7 shows that the production of coal sharply declined from 2011 to 2012, which continued until 2013 to 2014. The production in 2014–2015 saw an uptick from 6,63,660 tonnes per annum (in 2013–2014) to 7,79,020 tonnes per annum. After producing only 4,86,532 in 2015–2016, NEC Margherita officially stopped production. Ledo (UG) and Borgolai (UG) had already stopped coal production in 2009–2010. In Tipong (UG), coal production was temporarily stopped in 2009– 2010, but the mine reopened in 2010–2011.

Detail of Production of Margherita Coalfields	-4-

Total coal reserve: 1.68 MT

Mineable reserve: 1.68 MT

Coal production (upto January, 2016): 34,174 Tonnes

Rate of production: 0.15 MT pe annum Life of mines: 14 years

Grade of coal: Grades G-1 & G-2

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Just transition for all would mean mitigating the social and economic risks for the workers, their families and the coaldependent communities at large.

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Note. From the official website of NEC (http://www.neccoal.co.in/index.php#gsc.tab=0; 2016).



Note. From the official website of NEC (http://www.neccoal.co.in/index.php#gsc.tab=0; 2016).

The coal despatch from Margherita had a similar trend, as shown in Figure 5. In 2012–2013, the annual despatch fell from 8,00,035 tonnes (2011–2012) to 618248 tonnes. In 2015–2016, the coal despatch from Margherita further declined to only 3,41,869 tonnes. The coal despatch from Tipong, Ledo (UG) and Borgolai had already stopped in 2009–2010 (Figure 8).

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Inconsistent support from corporate social responsibility (CSR) and the District Mineral Foundation Trust (DMFT)

One of India's strong efforts to ensure that developmental activities take placein perfect harmony with social and environmental sustainability is to make it mandatory for companies to implement effective and efficient CSR activities (Singh & Mishra, 2016). This section summarises the extent to which the CSR activities in our study site of NEC Margherita contributed to the sustainable development of the locality.

Analysis from the present study revealed that the CSR initiatives in the area had limited

outcomes despite the substantial expenditure of money and efforts by the industry. Most of the initiatives undertaken were short-term mitigation of business impacts. Annual CSR activities numbered10 to 12 in 2011–2014 but were reduced to leach in 2015 and 2016, after which time no data are available (Table 1).

This report recommends the integration of CSR measures into the core business operations of the industry. Also, the companies need to conduct a standard needs assessment before undertaking a CSR activity. This should be followed by periodic impact assessments to align their CSR activities with the Sustainable Development Goals.

Table 1

Corporate Social Responsibility (CSR) Undertaken by NEC Margherita

Year	Name of the work and place
	Construction of approach road to Hamukjan Village, Ledo
	Repair of school building at Malugaon,Tikak
	Development of road to the church at Malugaon-III,Tikak
	Construction of approach road to Rang Ring,Tikak
2011 12	Arrangement of water supply at Hamukjan Village
2011-12	Construction of Tikak Development Committee building
	Construction of approach road to deepwell of Hamukjan, Ledo
	Construction of drinking water supply pipeline to China Basti, Tikak
	Renovation of Tikak Namghar Building
	Construction of roofing with MS frame truss of Kendriya Rangamanch, Tikak
	Construction of boundary wall around the public hall at Sreemanta Sankardev Construction of thermal Namghar at Ledo
	Construction of compound wall and approach road to the NEC ffice of Assam Sahitya Sabha at Hamukjan
	Water supply arrangement and construction of road at Hamukjan Village, Tikak
	Construction of latrine and urinal and fencing around the community hall at Malugaon-III, Tikak Colliery
	Construction of community hall at China Basti, Tikak settlement area
2013-14	Completion of balance portion of the open auditorium, Tikak colliery
	Development of road to Rang Ring Village, Tikak colliery
	Construction of community centre, Tikak colliery
	Water supply arrangement at Signal Basti,Tikak
	Construction of the road and pucca drain from Tikak Field Office to BCL Office, Tikak
	Construction of classroom at Sankardev Vidyapith High School, Ledo
	Construction of culvert at Parigaon at Hamukjan, Tikak colliery
2014-15	Construction of training centre for women and children at Tikak China Basti
2015-16	Total electrification provided to Malu Goan-2 of TikakPahar

Note. From the official website of NEC (http://www.neccoal.co.in/index.php#gsc.tab=0; 2016).



The total deposit of DMFT funds in Tinsukia district was Rs 33.66 crore, and the amount allotted for carrying out development works was Rs 20.49 crore. However, only Rs 22 lakh could be spent in the district until December 2018, which is only 1.09 % of the allotted fund. All such facts make it amply clear that the very purpose of the formation of the DMFT in each and every district in the State has failed utterly. Doesn't Dispur need to delve deep into the matter and find out what has gone wrong in the system it has put in place for developing areas affected by mining?

Need to explore non-coal local enterprises

Besides the coal industry, which lies at the heart of trade in the Margherita block of Tinsukia district, some other industries operate. These local enterprises in the surroundings of the Margherita coalfield are the bamboo stick industry, computer enterprises, automobile enterprises, brick industry to agro-input enterprises and agro-produce dealers. Table 2 lists the names and details of these local enterprises.

Table 2

Details of Local Enterprises Around Margherita Coalfield

Name	Primary business	Secondary business	Relation to coal (if any)
Mahadev Bamboo Sticks Industry	Retailer	Manufacturer / Exporter / Wholesale supplier	Retailer of raw coal
Care Technologist (I) & Co.	Exporter of domestic eater purifier & spare parts	Manufacturer /Service pro- vider/ Wholesale suppliers	
MRG Gas	Retailer of gas	Manufacturer /Exporter/ Wholesale supplier	
Lahon Auto Parts			Coal dealer
Mahamaya Coal Pvt. Ltd.			
DBS Brick Field	Dealer of bricks		
Maheswari Co.	Dealer of black tea		
Natural Panel Industries Pvt. Ltd.	Retailer of wood &lumber	Manufacturer / Exporters / Wholesale suppliers of block board, plywood sheets, plywood, doors &windows	
Hill View Motors	Dealer of motor bike mainte- nance &r epair services		
Microchip Computers	Dealer of computers & accessories		
Ashim Borah Photography	Dealer of outdoor photography services		
Hot Oven	Dealer of bayleaf, black rice, ginger & tea		
Abohtani AgroProducer Co. Ltd.	Dealer of agro-products		
DimanSonowal	Dealer of tulsi		
TGF Traders	Dealer of steam coal		Dealer of steam coal

Note. From the Indian Yellow Pages(n.d.).

Trade based on coal from NEC may suffer from supply crunch

There are several non-core-sector coal consumers that rely on supply from NEC in Margherita. According to the company's official website, it has four major consumer industries: cement, ceramics, pipe manufacturing and paper mills. Coal was being transported beyond the state boundaries to two consumer industries: the pipe industry and the paper and board industry from Punjab and Uttar Pradesh, respectively (Table 3).

Table 3

List of Non-Core-Sector Consumers of NEC

Name of consumer	Allocated quantity per annum (tons)
Cement Corp. of India Ltd., Bokajan, Assam	36,000
Somal Pipes Pvt.Ltd., Ludhiana, Punjab	16,875
Oriental Ceramics Refractories Pvt. Ltd., Mohali, Punjab	18,750
Hindustan Paper Corp., Nagaon Paper Mill, Kagajnagar, Assam, 782413	90,000
Genus Paper & Boards, Ltd., Aghwanpur, Moradabad, 244001, Uttar Pradesh	Unit 1 19,206 Unit 2 10,500

Note. Source: official website of NEC, 2016.

Possible subsistence from agriculture: Local economy beyond coal

In rural Margherita, occupations such as poultry, goatery, agriculture farming, tea nursery, tea plantation, piggery, dairy, fishery and duckery are mainly run by womenfolk. For these, loans are usually sanctioned under SGSY (NRLM). Paddy and mustard are two of the popular agricultural crops, and tea is the most prevalent cash crop in the Margherita block (Agriculture Technology Management Agency ATMA - Tinsukia, n.d.). Census 2011 categorised 7,518 people in rural Margherita as cultivators and 656, as agricultural labourers (Government of India- Directorate of Census Operations, 2011). However, it is not easy to move toward agricultural farming for the community who lives in Margherita town.

How is lower income being replaced in the community?

- Shifting to agriculture;
- Migration to other distant places;
- Working as daily wage labourer;
- Opening of mobile vendor shops; and
- Other odd jobs.

Unavoidable job loss and livelihood changes after a coal mine closure

Since the inception of the coal industry, it has employed a large number of people and enhanced their skill sets to meet the sector's demands. Several townships have also developed around coal mines. As a result, a sizable population that is dependent on the coal sector may find their economic and social security threatened. This is illustrated in the survey conducted by JTRC. Out of the 172 respondents, 108 said there had been drastic changes in the existing livelihoods of the coal worker and non-worker residents of Margherita (Figure 9). Fifty-two percent said their level of income had decreased, and 20% had lost their job. Thirteen percent faced business recession—for example, a local sweets shop owner said that when the mine was still open, he used to earn 3-4lakhs per month, but after the mine closed, his business considerably declined. Only 5% of the respondents had no change in livelihood.



- Agricultural crops,
- Horticultural crops,

alternative livelihood:

Possible sectors of agriculture for

- Tea plantation,
- Agro-processing,
- Agro-forestry,
- Animal husbandry, and
- Agro-tourism.



Figure 9 Major Livelihood Changes after the Coal Mine Closure



The plight of the contractual labourers simply went unrecognised by the management, making them suffer the most at the time of closure. Their condition worsened to the point that they starved for nights, pushing their female family members to prostitution. One of the teary-eyed respondents who was a trade union leader narrated the same: 'I witnessed the distress of the contractual labourers to the maximum extent. Women went for prostitution. I myself, being a trade union leader, requested the management for minimum sustenance of the contractual labourers, told the same in discussions, [but] nothing happened'.

Source: JTRC (2022)

The fate of the contractual workers after



the Margherita mine closure



After a coal mine closure, the workers are left with no choice but to take up different work at lower wages. Mostly, there isno closure plan in place for the contractual workers, leaving them worse off and vulnerable. A similar fate awaited Salim Ali, who worked on contract for 17 years as a supervisor in an outsourcing company of Ledo Colliery named ANE Pvt. Ltd. He was hopeful that the company would extend his contract but after the Ledo colliery was shut down, the company lost its tender and, in turn, Mr. Ali's contract could not be extended. Mr. Ali has not had a regular source of income since 2018 and disclosed that more than 250 contractual workers are experiencing the same nightmare. Ali used to earn Rs. 15,000 per month; but after the mine closure, he has been making only Rs. 6,000-7,000 per month from off-mine jobs. He is a resident of Hamukjan Village, Margherita. He still hopes to get a job at the coal mines if they reopen. Mr. Salim could not move out of town and look for opportunities elsewhere as he cannot leave his family alone. The other workers who earlier expected the mine to reopen had left for other places in search of jobs. He asserted the importance of coal for their daily existence, saying, 'We can't survive without coal'.

Sanjay Ujir, who was a dumper driver in Tirap colliery, lost his job after the mine's closure and started working as a daily wage labourer. With a deep sigh, he said, 'My monthly income has decreased and it has become difficult to earn two meals for the day for me and my family'. Like Mr. Ali, Sanjay believes that only the re-opening of the colliery can improve their condition.

Chapter 02

Farming can be a viable alternative livelihood



option in the advent of coal mine closure

Hilson (2010) and Tambwe et al. (2011) observed the types of employment activities of former miners in Ghanaand the Democratic Republic of Congo, respectively. Closure of coal mines usually forced a part of the community to transition to commercial agriculture and animal husbandry (Andrews-Speed et al., 2005). Similar accounts were heard in the Margherita mining region.

Gokul Gautam is a 38-year-old resident of No. 1, Mulanggaon. He used to be an accountant in Tirap colliery. He said the economic condition of Margherita has drastically deteriorated due to the closure of the mine. The incidence of robbery, dacoity and other criminal activities has increased in this area. Being left with no work after the closure of the colliery, Gautam turned to farming. Following a similar trajectory, Najer Khan, former driver in the coal mine, took up farming after the mine's closure. He said the shift in occupation was not easy for him and his family. They had to face extreme financial hardship in the initial years of farming. He still wants to go back to his mine days. For him, 'Koila hai to bhat hai' ('There is food only when there is coal').

Manje La, a local resident and shop owner from Singhpo, recounted that after the mine closure, 90% of the people in that locality became dependent on tea gardens. Many people who did not have cultivable land of their own started tea cultivation in their kitchen garden. He started believing that 'Tinsukia will specialize in tea and lemon'.



Following the closure of the coal mine, the air in Margherita has become heavy with deep concerns about what would happen to the locals and communities working in the coal sector.

After the mine closure in Ledo, the locality looked like a ghost town, with only the permanent residents left. The dejection and business loss led shop owners to close their shops. Only the workers involved in maintenance-related jobs continued to work in the company after the mine closure. People who were solely dependent on coal mines are sitting jobless, waiting for the mines to reopen. When some of the mines opened partially, the ones who managed to get their jobs back were given reduced wages.

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Did the pandemic add fuel to the fire? Narration of a

local shop owner who faced coal mine closure



Munmun Khusro, a local shop owner from Kailash Ashram, a small village near the Tikak coal mine, lost her husband a few years before the mines closed. After her husband's death, she took over the shop to support her family. She narrated to us the pain of the financial crunch after the coal mine closure, which was aggravated by the pandemic and subsequent lockdowns:

The buying capacity of people was reduced as many people lost their jobs due to the mine closure. Many have migrated to other places. To add to this, we had to keep the shop closed for the last two years due to the pandemic. We suffered a huge loss. Ms. Khusro's customers have dropped by almost 70%. At some point, she is certain that she has to shut down her shop and send her eldest daughter to Bangalore to work as a domestic helper.

Lesson 4.

Strong institutional support in the health and education sectors enhances the resilience of the community against the adversities of the mine closure.

In addition to being the source of local revenue, local employment and business opportunities, coal mines also provide incentives for building local infrastructure. Mining activities bring basic infrastructural facilities such as schools, hospitals and improved transportation and communication facilities to remote villages that enable local communities to expand and diversify their livelihood options (Smart Energy International, 2021).

Social welfare activities for the overall development and enhanced living standards of the townships

In the case of the collieries of the Margherita Coalfield, the company initiated some social welfare activities for the overall development and enhanced living standards of its employees. The main areas of welfare focus in NEC were the maintenance of the company quarters and the provision of standard living accommodations to all the employees of NEC. Annual sports meets and cultural programs were also organised under the welfare schemes in all the units.

Margherita Central Hospital in World War II



The British built the hospital during World War II to support their Forward Operating Bases (FOBs) on the Myanmar front. After India gained independence, Coal India Limited acquired it and turned it into a primary hospital for their NEC division. The hospital started out as Ledo Hospital during World War II and is now the Ledo Dispensary. Later, it was moved to its current location, at the centre of Margherita town.



The Margherita Coalfield of NEC has a central hospital that is one of the oldest in north eastern India. The hospital has a bed capacity of 112 and delivers comprehensive health care services to the employees and to people living in the surrounding area and in eastern Arunachal Pradesh. Patients come from nearby towns such as Digboi and Tezu, along with Margherita.

The hospital currently has several departments, including those for medicine, surgery, obstetrics and gynaecology, as well as dedicated services for ENT, eye care, dental care, paediatrics, radiology and emergency, with cutting-edge medical technology. The hospital also has a digital X-ray, ultrasonogram and operating room. Earlier, the annual turnover of the hospital was around Rs. 27,000 to 30,000 per annum for out-patients and Rs. 2,000–2,200 per annum for in-patients, which were added to NEC's revenue.

The JTRC survey team interviewed the doctor of the NEC Central Hospital. He told us that when the coal mines were in operation, CSR activities were being implemented that included free health benefits, even for the contractual workers as part of their contract. He added that they organised over 100 health camps to reach the communities even after the mine closure. He said patients used to come from three states—Assam, Arunachal Pradesh and Nagaland-because of the availability of specialised doctors and nurses and of good facilities for comparatively lower fees. The hospital continues to function after the mine closure. While interviewing the local communities, a resident student union leader said students were heavily dependent on the company hospital due to the availability of several specialist doctors there for less than 30 or 40 rupees.

The coal mine can be closed but educational institutions must go on

Workers and the local community are also heavily dependent on company schools and college. The colliery provides grants-in-aid and supports these educational institutions. During our individual interviews, we found that the institutes are still running properly even after the mine closure. However, the closure impacted the income of the workers, due to which they could not pay the school fees indefinitely, therefore adversely affecting their



children's education. The loss of income of the mine workers and their resulting default in payment of school fees have also hampered the education of those who went to other private schools around the Margherita region. The details of the schools in Margherita are provided in Table 4.

Table 4

Schools in Margherita

Name of school	Location	Type of aid	Affiliation
Blue Bird School	Ward No. 4, Margherita Town	Private unaided organisation	Central Board of Secondary Education (CBSE)
The Little Stars Senior Sec- ondary School	No. 1 Borbil	Private unaided organisation	CBSE
Carmel School	Ward No. 6, Digboi Town	Private unaided organisation	Council for the Indian School Certificate Examinations (ICSE)
Parijat Vidyalaya	Ward No. 1, Margherita Town	Private unaided organisation	
Vivekananda Academy	Ward No. 3, Digboi Town	Private unaided organisation	State Board
Margherita Public Higher Secondary School	Ward No. 2, Margherita Town	Department of Education	State Board
Vivekananda Kendra Vidy- alaya	No. 1 Borgolai Gaon		CBSE
Rashtriya Vidyalaya Higher Secondary School	Ward No. 1, Digboi Town		Department of Education
Shishu Niketo Higher Secondary School	Ward No. 5, Digboi Town		State Board
Vivekananda Vidyalaya Higher Secondary School	Ward 4, Digboi Town		Department of Education

Note. From Studyapt

Anganwadi Centre, Bargolai village

Besides schools, Margherita College is also in the town. It is known locally for its mechanical engineering course.

Relief and rehabilitation prevent burdening the society after the mine closure

Rehabilitation as a component of mine closure is a part of the ongoing process of restoring the physical, chemical and biological quality of the local social-ecology that was damaged by the mining closure to a level that is acceptable to all parties (Indian Bureau of Mines, 2022). Rehabilitation must strive to leave the area in a way that prevents burdening the society after the mine was closed. It must also seek to develop an ecology that is self-sustaining.

This report throws light on the miserable rehabilitation services that were given to the coal workers after the Margherita mine closure. According to trade unions of Margherita, workers who had been provided provident funds got the money after the coal mine closure, but they were few. On the contrary, trade unions in Margherita said only a few workers were transferred to other coal mines, and the overall attitude of the company management toward the workers was not right. The company said, 'As the coal mine has been closed, we do not need you right now; we will call you when it starts again'. The drivers of the coal company got only 10,000 rupees as compensation.



Lesson 5.

Mine closure forces the workers to migrate to faraway places with uncertain futures.

Migration from the localities became a daily phenomenon in Margherita after the coal mines were shut down. This section covers the quantity and direction of inter-state migration, as shown in Figure 10.

In Tipong, there were 800–850 employees in the coal mine and almost the same number of people working in other mines of Margherita Coalfield. One of the union presidents informed us that the number of contractual labourers in

Figure 10 Outmigration Map of Ma

Outmigration Map of Margherita, Assam



Note. From Survey by Just Transition Research Centre Indian Institute of Technology Kanpur

five collieries was reduced to 300 from around 2,000 in each of the collieries due to the mine shutdown. After the closure, majority of the workers, especially those who did not have any technical knowledge or capital, left the place and went to Orissa, Jharkhand or Bangalore. Those who had technical knowledge went for technical jobs in some other organisations, and the rest started petty businesses such as food shops or bought e-rickshaws. A forest official informed us that after the mine closure, many of the formal workers were transferred to Meghalaya. One of the trade union general secretaries of Margherita Coalfield expressed his grief that workers were transferred suddenly to somewhere, which left an immense impact on them and their families. Mr. Bora, one of the respondents, told us that around 10,000 people migrated to other states such as Jharkhand and Karnataka. Kerala, Uttar Pradesh, Bihar, Orissa and Telengana became the other outmigration destinations.

In the local tribal communities, the same scenario was observed. In the Ao community, around 50% of people were dependent on coal for their livelihood. Naturally, this community faced the worst time after the closure. The locality became desolate after the residents left the place. The local economy spiralled down because of the heavy outmigration. The pandemic and the lockdowns made the situation worse.

The major shock of the coal mine closure was also felt by the local shopkeepers. Most of them either migrated to other places or went back to their own villages.







Policy and Strategy

6

Reptile .

Development

Mine Closure 2022

JTRC team visiting Tirap Colliery

Lesson 6.

Trade unions as agents of change: unions can make strategic choices together in response to a variety of contextual conditions.

Trade unions can play a pivotal role in implementing just transition. Unions can strategically decide which transition tactics to implement in light of the following contextual factors: 'the particular set of conditions within which the action/interactional strategies are taken' (Strauss & Corbin, 1990). In South Africa, for example, trade unions that follow the heritage of social movement unionism have formed just transition alliances with environmental NGOs, environmental justice organisations, community organisations and international union federations, from the local to the national levels. Green transition policy debates and governmental involvement in green transitions have a considerable impact on union transition strategies. First and foremost, it is crucial for a state to build political pressure for the phase-out of coal. In the case of Germany, unions became involved in the discussion when the federal government added the phase-out to the policy agenda (Kalt, 2022).

In Margherita, trade union strategies range from transformational to empathetic. Trade unions were highly active against the coal mine closure and staged protests and agitations from the very first day. The permanent workers were directly involved in the trade unions' agenda, but the workers who came through contractor companies are still not organised, said one of the trade union general secretaries. He further stated that unions demanded from NEC CIL the re-opening of the coal mines, as the mines are the lifeline of the area and the local economy is greatly dependent on the coal mines.

All the four trade unions in the area—Bharatiya Mazdoor Sangh (BMS), Hind Mazdoor Sabha (HMS), Centre of Indian Trade Unions (CITU) and Indian National Trade Union Congress (INTUC)—related to the Margherita Coalfield work together to demand there-opening of the coal mines. According to a union leader, 'All the trade unions had an inkling that the mine closure will happen someday.... Then suddenly, we witnessed that all the coal mines, even those not supposed to be closed, were shut down'. Thereafter, all the four unions established a joint action committee due to the limited number of key persons to lead the re-opening agenda. With this agenda of the mines' re-opening, the committee went to the authorities at all levels: NEC, CIL, the Chief Minister of Assam, the central government in Delhi and even the High Court when the company tried to reduce the manpower. The committee held almost 20–25 back-to-back meetings in each and every colliery, such in Tikak and Tipong.

The union president from the Tipong colliery informed us that when the mines were being closed, the unions were not very active. He also claimed that contractual workers were also associated with the trade unions. Among the NEC trade unions, a strong bond was seen, with little or no competition. CITU has 300–350 members, and the other workers are members of BMS, INTUC and HMS. However, presently, no contractual labourers are members of trade unions. Even if they attend the meetings, they sit on the last bench. This account by a trade union leader depicts the lack of integration of contractual labourers into the trade unions.

The aforementioned narratives underline the need for the inception of a proper just transition policy process oriented on social dialogue, where unions readily accept the need to phase out coal while exercising their institutional power to negotiate the terms and conditions of a just transition. Trade unions can act as impactful agencies and can be best placed to manage closure on behalf of several other grassroots stakeholders.

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Trade unions were highly active against the coal mine closure and staged protests and agitations from the very first day.

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Lesson 7.

To achieve sustainable livelihood after coal mine closure, the policies must think beyond jobs.

Figure 11 Sustainable Livelihood Framework in the Context of Just Transition



Note. Adapted and modified from the Sustainable Livelihoods Model of the Department for International Development (DFID, 1999) in the context of just transition.

The research described in the previous sections was undertaken following the SLF. Through the case of the NEC CIL mine closure in Margherita, this report aims to provide information to policymakers that can assist them in framing transition policies that support the coal worker and non-worker community with at least sustainable livelihoods. The SLF shows how 'in different contexts, sustainable livelihoods are achieved through access to a range of livelihood assets (natural, economic, human and social capitals), which are combined in the pursuit of different livelihood strategies (livelihood diversification and migration)' (Scoones, 1998). This framework provides an employment-based, upstream, anti-poverty strategy to community economic development (see Figure 11), guides the investigation of the factors that affect people's livelihoods and relationships and helps to identify more

feasible entry points for policy interventions (DFID, 1999; Murray & Ferguson, 2002). A livelihood comprises the necessary skills, assets and activities required for a means of sustenance, and it would be sustainable 'when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets' now and in the future (DFID, 1999).

Vulnerability context

Within the SLF, the present report views the environment-development contest in Margherita and the consequent coal mine closure as a pervasive and unrelenting shock that can escalate over time, forcing many coal workers and non-workers to leave their place, jobs and social support.



Livelihood assets

In the context of just transition, the livelihood pentagon can be accommodated within a triangle: the environment, economy and community. Environment assets take care of the natural capital; economic assets, the financial capital; and community assets, the human capital, social capital and physical capital.

The livelihood triangle is at the centre of the model and remains within the vulnerability context: 'Assets are both created and destroyed as a result of the shocks, trends and seasonality of the vulnerability context' (DFID, 1999).

Environment assets

Natural capital is considered the world's stocks of natural assets, which include geology, soil, air, water and all living things. In Margherita, the coal mine closure partially happened to conserve the land, forest and natural wildlife habitat (see the detailed discussion in Chapter 1).

Economic assets

The sudden coal closure led both the worker and non-worker communities to experience dramatic downward mobility in income status, loss of existing means of sustenance and, in extreme cases, difficulty in earning enough to provide two meals a day to one's family (see the detailed discussion in Chapter 2). For the community to be spared the negative economic impact of mine closure, proper access to economic assets is critical. Recognising that sustainable employment is an important and socially acceptable way to build financial assets and security, providing structural support for the low-income population of Margherita, combined with minimised risks to their own well-being and that of their family, would make for a proper relief and rehabilitation process.

Community assets

After the Margherita coal mine closure, the coal worker and non-worker communities became rudderless and could not find the immediate way to live without coal. People became compelled to migrate to other places or states for some sort of subsistence, which caused subsequent human capital loss in Margherita. In the case of social capital, which refers to social resources that are both a means of achieving livelihood objectives and help in coping with a vulnerable situation (DFID, 1999), connections between and among the workers and their unions became loose in some cases. For example, a contractual worker who used to attend the union meetings, after the closure, sat on the back benches during the union meetings and left the union. Gaon Buras can also be considered the social capital in Margherita, as they are indispensable parts of the local community and key persons to contact due to their critical role throughout the process of just transition.

Physical capital is highly critical for the community after a mine closure to ensure that they will continue to have secure housing, transportation, health and children's educational facilities. However, the usual crowd of patients in the company's central hospital became thin, and parents could no longer afford their children's school fees indefinitely. However, housing and recreational facilities such as parks are still in place.

Trade unions are neither helpless nor passive! Unions change, innovate and pursue new strategies



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Transforming agent

In the process of just transition, trade unions can play a critical role in the transformation of the existing transition strategies (Kalt, 2022). The role of trade unions before and after the Margherita coal mine closure is discussed in the first section of Chapter 3. Moving away from the standard depiction of unions as victims, they can be highlighted as an agency with power as well as empathy for the community. 'Trade unions are neither helpless nor passive! Unions change, innovate and pursue new strategies' (Friedrich Ebert Stiftung, n.d.).

Process and policy

The livelihood system was represented by the respondent worker and non-worker community from Margherita and was understood by the researchers as complicated and uncertain. To effectively use this kind of knowledge to influence decisions and develop initiatives or programmes remains a challenge for researchers and policymakers, especially when 'there has been a tendency ... for conventional tools of programme planning and monitoring to ... treat projects as closed, controllable and unchanging systems' (Mosse, 1998). The analytic framework, which bridges the gaps between the coal worker and non-worker community and the researchers as well as between the researchers and policymakers, offers ways to resolve this difficulty. The conceptualisation of assets as different kinds of capital has usefully translated the survey findings into the language of policymakers. These terms are especially helpful for highlighting the vital role of intangible assets (social and political capital) in creating livelihoods as well as the trade-offs between various capitals and strategies that determine how sustainable the process of transition is. Key aspects of coal community livelihoods are thus intricately 'translated' through the research framework.

SLF in the context of just transition is framed in terms of people's lives and the institutional environment in which they are embedded. This could help the negotiation process by allowing discussions concerning sectoral policy issues to be viewed in new ways. This may lead to new connections and possibilities for a favourable policy.

Livelihood outcomes

Restoring the environment and ensuring jobs are two important outcomes that are relevant to this study, although outcomes are unique to the context. Provision of an alternate occupation needs to be considered after the coal mine closure. After such closure, as mentioned in Chapter 2, local businesses that evolve around the coal mine and the company township are threatened by conspicuous business recession. Thus, helping entrepreneurs to regain their business will be one of the possible livelihood outcomes. Another outcome can be checking the outmigration of people and initiating reverse migration by creating ample livelihood opportunities that will entice the people to return Margherita. Sustenance and resilience of various social, human and physical capital must also be ensured. However, SLF not only enables identification of the spaces where gaps exist but also highlights the potential change agent who can be empowered through policy interventions. It is comparatively easy for policymakers to intervene at the level of the formal institutions (Table 5). The table places emphasis on the negotiating processes that take place within local and non-local institutions that mediate access to resources. By elucidating these processes, direct links are made to a parallel understanding of policy as 'negotiated between a set of different stakeholders who vary in terms of influence, power, access to information, perspectives and interests' (Norton, 1998).

What is more difficult is to understand and consider potential conflicts at the interface between the micro and the meso, meso and macro and changes that policy might bring to the micro-institutions.

Life After Coal Mine Closure 2022

Table 5

Key Structure and Entry Points for the Implementation of the Sustainable Livelihood Framework into the Just Transition Policy

Livelihood assets	Micro: In coal mines	Meso: In NEC Margherita	Macro: In India
Environment	Legal mining tenure; environment and forest clearance; air, water and soil quality assessment	Coal mine area within wildlife habitats; CSR services; agricultural farming	Maintenance of proposed reserve forest
Economy	Amount of coal produced and despatched; Employment of the coal workers	Employment of the coal work- ers; CSR and DMFT services; agricultural farming; local business; credit facility for small and marginal business- es; provision of re-skilling	Share of NEC in the revenue of CIL; supply of coal to industries beyond the state boundary of Assam
Community	Number of coal company workers (both formal and informal), number of coal-induced residents	Education and health services; recreational facility; migration	Migration; Human Development Index

Note. Made by the Just Transition Research Centre, Indian Institute of Technology Kanpur NEC: North Eastern Coalfields, CIL: Coal India Limited, CSR: Corporate Social Responsibility, DMFT: District Mineral Trust Fund

Conclusion

CAREAR STREAM STREAM

COAL

Margherita Coal Museum



Lessons from the Margherita coal mine closure will pave the way for future actions in the process of just transition in the Indian context.

The mine-forest-wildlife nexus is susceptible to socio-ecological contestation, and green campaigning may lead to mine closure in Margherita. However, local demand for socioeconomic development cannot be ignored. Thus, identification of the ground reality and the context under which the coal mine is compelled to be closed is necessary.

Taking care of the coal workers as well as the worker local residents is the second most critical chapter in managing a coal mine closure. The mine closure in Margherita created an enormous economic impact on the local economy and caused livelihood changes as well. Coal production and despatch already showed a decreasing trend in the last few years of closure; that can be an potential indicator of closure. The sub lessons pointed out that inconsistent support from CSR activities and the DMFT fund make the situation even worse. However, support from health and educational institutions can help the community to survive and cope with the adverse impacts of closure. Migration from the localities became a daily phenomenon in Margherita after the coal mines were shut down. The present report covered the quantity and direction of interstate migration through a migration map.

Promoting broader understanding of community livelihoods in the context of coal mine closure is important to support future best practice. The SLF has sparked much interest and is a useful tool for facilitating discussion of development policy approaches in the context of just transition. The process of acknowledging the complexity and diversity of livelihoods in the process of mine closure and incorporating this recognition into policy can include critical discussions on just transition.



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Appendix A

Methods and data

A mixed-methods research design is used by employing a range of quantitative and qualitative data collection techniques.

Study Area Selection

Tikak Colliery: Tikak Colliery is an open-cast mine that was established in 1986. The mine is part of Coalfield. It is located about 10 km from Margherita. Tikak Colliery has two units: Tikak East and Tikak West.

Tirap Colliery: Tirap Colliery is one of the three operating open-cast mines of NEC and has been in existence since 1983. It is located in the Makum Coalfields of Assam. The mine is well connected by roads and railways.

Tipong Colliery: Tipong Colliery was opened in 1924 as part of the MakumCoalfield under the ownership of M/S A.R.T. Company Limited. Its southern limb is sharply inclined, whereas its northern limb is cut off by the Margherita thurst.

Ledo Colliery: The Ledo OCP (area: 0.85 km2) is situated in the northern part of Makum Coalfield, 10 km northeast of Margherita town (i.e., the headquarters of NEC) and 60 km southeast of Tinsukia district. The area is connected to the rest of the country by the NH.38 and BG railway line that extends up to Tirap Siding, which is 1.5 km west of the property.

Borgolai Colliery: Borgolai Colliery consists of the Borgolai underground mine and the small manual quarries, the Tikka and Namdang Sections.

Pilot study and pre-testing of interview schedule

Before performing the actual fieldwork, a pilot study was conducted to understand the geographical area, local stakeholders and key institutions interacting with NEC, the local community and unions. A firsthand experience of the socioeconomic background of coal mine workers and other residents of the concerned coal mines and their thoughts pertaining to the implication of the mines on the environment, livelihood and health, along with other important socioeconomic aspects, helped in the construction of reformative working tools in an iterative manner. The pilot study was conducted at the Tikak OCP area in Assam. First, the team conducted 12 interviews to check the questions for flow, comprehensibility and language understanding. Then, the wordings of the questions and the formatting of the interview schedule were corrected. The revised form of the questions was re-tested with more samples from the local community and affected workers. Through iterative testing and validation after 15 interviews, we finalised the interview schedule. The sample respondents of the pilot study were excluded from the main interview.

Sampling and sample design

The purposive sampling technique was used for the selection of the state, district, coal mine and towns or villages that would be ideal for our study of just transition and mapping of the consequences of mine closures. For the selection of the respondents, add survey team used the snowball sampling technique to interview affected workers (e.g., on job loss due to closure) and residents, and we used the incidental sampling technique to select respondents from local markets close to the sample coal mines. The respondents were asked for the contact numbers of workers who have been affected or who were working in the coal mine that had been partially or fully closed. Figure A1 presents the entire sampling design and the units studied.



Data collection

We collected both primary and secondary data for our report. Primary data were collected from 172 respondents in July 2022. The structured interview schedule used for the quantitative data collection consisted of both open and closed questions. This resulted in data collection from 172 interviews from coal mine communities (coal workers and non-worker residents combined).

For the collection of qualitative data, we conducted 26 face-to-face interviews with coal workers and non-worker residents and six interviews with trade union leaders or members. Moreover, we used the official websites of different organisations such as NEC, ILO, UNEP and the World Bank, as well as books, published news, journal articles and relevant blogs, to extract secondary data. The key themes searched for each of the tools were on (i) the contestation between the environment and development, (ii) the impact on coal worker and non-worker communities and (iii) the role of trade unions. At the end of the interviews, the respondents were encouraged to mention as many indicators, reasons and practices as possible to express their preferences for practices, situations and attitudes toward just transition.

Data analysis

We used Statistical Package for Social Sciences (IBM - SPSS) version 27 for data entry and analysis. By and large, we used descriptive analysis (i.e., percentage and frequency). We also used Microsoft Excel for customised visualisations of the data.



Note. Source: Census, 2011.



Literate Population 🗧 Illiterate Population

Just Transition Research Centre

Note. Source: Census, 2011.

Figure B3 Overall Population by Gender in Margherita Block





Note. Source: Census, 2011.

Figure B4 Overall Population by Working Status in Margherita Block



Life After Coal Mine Closure 2022

In this report, basic demographic data were extracted from the last census (2011) of Margherita Block in the Tinsukia district of Assam. The literacy rate in Margherita Block is shown in Figure B1; half of the total population is non-literate. Majority of the residents come under the general category, scheduled tribes (ST) are also there at a significant percentage, but the scheduled caste (SC) population is negligible (Figure B2). In the study areas from Margherita Block, the men-women ratio is almost 1 (Figure B3). Figure B4 shows that the percentage of the non-working population in Margherita.

Demographic Data of Settlements Within 25 Km of the Margherita Coal Mine Area in Tinsukia, Assam

Figure B5 Total Population by Gender Within 25 Km of the Margherita Coal Mine Area



Figure B6 Total Population by Working Status Within 25 Km of the Margherita Coal Mine Area

Working vs Non-Working Population



Note. Source: Census, 2011.

Figure B7

Total Population by Literacy Rate Within 25 Km of the Margherita Coal Mine Area



Figure B8 Total Population by Caste Within 25 Km of the Margherita Coal Mine Area



Note. Source: Census, 2011.

Within 25 km of the Margherita coal mine area, majority of the population resides in Margherita town, Lekhapani and Digboi and the men-women ratio is almost equal (Figure 5). The working population is also less; majority of the working population is from Lekhapani, Margheita and Digboi in decreasing manner (Figure 6). However, the literacy rate is very low—only 28% are literate (Figure 7). The maximum number of people hailing within 25 km under general category and in the SC–ST population is 6% altogether (Figure 8).

Literate: A person aged 7 years and above who can both read and write with understanding in any language is considered literate. A person who can only read but cannot write is considered non-literate. For a person to be considered literate, it is not necessary for the person to have received any formal education or passed any minimum educational standard. Literacy could have been achieved through adult literacy classes or through any non-formal educational system. People who are blind butcan read in Braille are considered literate.

Literacy rate: The literacy rate of the population is defined as the percentage of literate people in the agegroup of seven years and above. For different agegroups, the percentage of literatepeople in anagegroup gives the literacy rate for that age group.



Types of workers prevalent in the concerned gram

panchayats of the studied collieries of Margherita, NEC



Main worker: A person who has worked for the greater part of the reference period (i.e., six months or more during the last year preceding the date of enumeration) in any economically productive activity.

Marginal worker: A person who worked for less than six months of the reference period (i.e., in the last year preceding the date of enumeration) in any economic activity.

Non-worker: A person who has not worked at all in any economically productive activity during the reference period (i.e., in the last year preceding the date of enumeration).

Cultivator: For purposes of the Census, a person who is engaged in cultivation of land owned or from the government or from private persons or institutions for payment in money, kind or share. Cultivation also includes effective supervision or direction of cultivation. Cultivation involves ploughing, sowing, harvesting and production of cereals and millet crops (wheat, paddy, jowar, bajra, ragi etc.) other crops (sugarcane, tobacco, groundnuts, tapioca etc.) and pulses, raw jute and kindred fibre crop, cotton, cinchona and other medicinal plants, fruits, vegetables, orchards or groves etc. Cultivation does not include plantation crops such as tea, coffee, rubber, coconut and betel nuts (areca). The workers engaged in plantation crops are recorded under 'other workers'.

Agricultural labourer: A person who works on another person's land for wages in cash or kind or share. They have no risk in the cultivation, but merely work on another person's land for wages. Agricultural labourers have no right of lease or contract on land on which they work.

Other worker: A person who has been engaged in some economic activity during the last year of the reference period but not as a cultivator or agricultural labourer or worker in the household industry. 'Other workers' include all government servants; municipal employees; teachers; factory workers; plantation workers; those engaged in trade, commerce, business, transport, banking, mining, construction and political or social work; priests; entertainment artists; etc. In fact, all workers other than cultivators or agricultural labourers or household industry workers are 'Other workers'.

Household industry worker: Household industry is defined as an industry conducted by one or more members of the household at home or within the village in rural areas and only within the precincts of the house where the household lives in urban areas. The larger proportion of workers in household industry should consist of members of the household. The industry should not be run on the scale of a registered factory, which would qualify or must be registered under the Indian Factories Act, and should be engaged in manufacturing, processing, servicing and repair of goods. It does not include professions such as those of a pleader, doctor, musician, dancer, waterman, astrologer, dhobi, barber etc. or merely trade or business, even if such professions, trades or services are run at home by members of the household.

Overall Employment Data of Margherita Block in, Tinsukia, Assam

Figure B9

Total Population of Main Workers vs. Marginal Workers in Margherita

Main Worker vs Marginal Workers



Note. Source: Census, 2011.

Figure 10 Total Population by Main Cultivators vs. Marginal Cultivators in Margherita

Sum of Main Cultivators Sum of Marginal Cultivators 6000 5000 4000 3000 2000 1000 0 Jagen Inthem Lekhapani Barebil Barbil Samukhjan Kumsai Ledo Golai Bromajan Powai Katakong **Bhitor Powai** Borgolai Purani Pukhuri Kamer Paity Ketetong Katalong Molum Pathar Makum Kumar Potty

Main Cultivators vs. Marginal Cultivators

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Figure B11 Total Population by Main Agricultural Labourers vs. Marginal Agricultural Labourers in Margherita

Main Agricultural Labourers vs. Marginal Agricultural Labourers





Note. Source: Census, 2011.

Figure B12 Total Population by Household Industry Workers vs. Marginal Household Industry Workers in Margherita





Total Population by Main Other Workers vs. Marginal Other Workers in Margherita

Main Household Industry Workers vs. Marginal Household Industry Workers



Note. Source: Census, 2011.

In the case of the employment data from Census 2011, in Margherita, the percentage of marginal workers is higher than that of the main workers (Figure B 9). In the agriculture sector, the main cultivators are greater in percentage (Figure B 10); but for agricultural workers, the percentage of the main and marginal agricultural workers are almost the same (Figure B 11). Marginal workers are abundant in household industries (Figure B 12); in the other sectors, the main workers are higher in percentage (Figure B 13).

Total Population by Working Status Within 25 Km of the Margherita Coal Mine Area

Main Workers vs Marginal Workers



Note. Source: Census, 2011.

Figure B15: Total Population by Main Cultivator vs. Marginal Cultivator Within 25 Km of the Margherita Coal Mine Area



Main Cultivator vs. Marginal Cultivator

Total Population by Main Agricultural Labour vs. Marginal Agricultural Labour Within 25 Km of the Margherita Coal Mine Area

Main Agricultural Labour vs. Marginal Agricultural Labour



Note. Source: Census, 2011.

Figure B17 Total Population by Main Household Industry Workers vs. Marginal Household Industry Workers Within 25 Km of the Margherita Coal Mine Area)





Total Population by Main Other Workers vs. Marginal Other Workers Within 25 Km of the Margherita Coal Mine Area)

Main Other Workers vs. Marginal Other Workers



Note. Source: Census, 2011.

Within 25 km of the Margherita coalfields, the main workers are higher in percentage than the marginal workers (Figure B 14). In the case of agriculture, at Lekhapani and Ledo, the main cultivators and agricultural labourers are abundant, whereas in Hamukjan, agricultural labourers come under the marginal category (Figures B 15 and B 16). Majority of the household industry workers are marginal, and most of them are from Margherita and Ledo (Figure B 17). In other sectors, the main workers are abundant (Figure B 18).



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